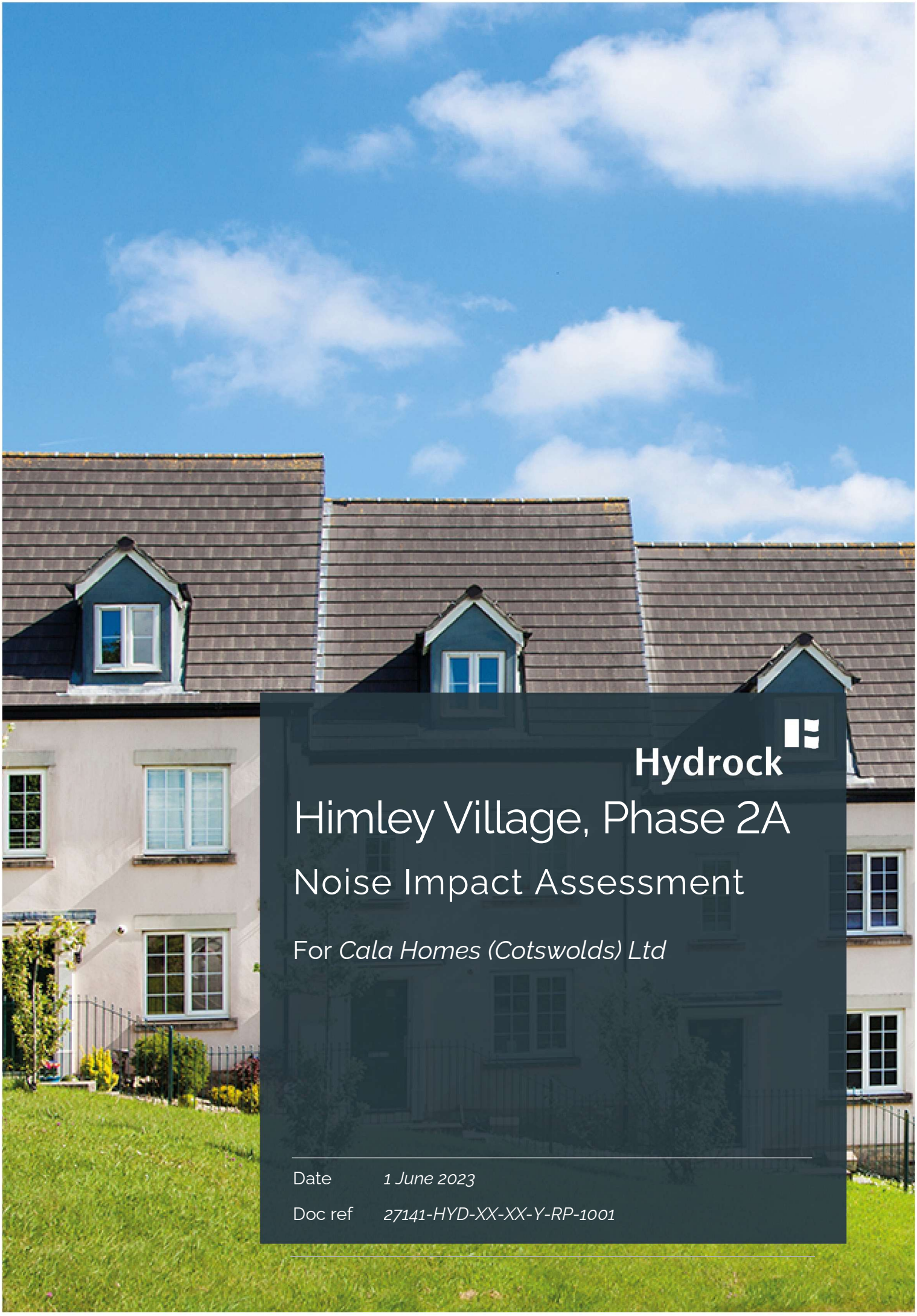

Hydrock

Himley Village, Phase 2A

Noise Impact Assessment

For *Cala Homes (Cotswolds) Ltd*

Date	*1 June 2023*
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1. INTRODUCTION

1.1 Overview & Background

Hydrock has been appointed to provide acoustic engineering services in relation to the proposed Himley Village Development, Bicester.

An outline planning application for the Development was submitted, for up to 1,700 residential dwellings (Class C3), a retirement village (Class C2), flexible commercial floorspace (Classes A1, A2, A3, A4, A5, B1 (now E(g), C1 and D1), social and community facilities (Cass D1), land to accommodate one energy centre and land to accommodate one new primary school (up to 2FE) (Class D1). Such development to include provision of strategic landscape, provision of new vehicular, cycle and pedestrian access routes, infrastructure and other operations (including demolition of farm building on Middleton Stoney Road), planning application ref. 14/02121/OUT.

The application was granted planning permission with Conditions, which were later subject to a Non-Material Amendment. The following noise-related Conditions for the Development are as follows:

14. Each reserved matters application for a phase that includes the construction of any new buildings shall consider whether any area of that phase is subject to elevated levels of noise, principally from road traffic sources as set out in the Environmental Statement. Any dwellings that are to be constructed in any affected area within that phase shall be identified and confirmation provided that they will be designed and constructed in such a manner that they will contain elements of sound insulation that will ensure that the internal noise levels contained within BS 8233:2014 Table 4 can be achieved.

Reason: To ensure that properties are not subject to high levels of noise in accordance with Policies Bicester 1 and ESD15 of the Cherwell Local Plan 2011-2031, Policy ENV1 of the Cherwell Local Plan 1996 and Government guidance contained within the National Planning Policy Framework.

15. Noise levels from any mechanical plant and the energy centre shall not exceed the noise emission limits contained within table 10.15 of the Environmental Statement. Any reserved matters submission for the energy centre or for development that will include mechanical plant shall include details of how the noise emission limits for that development will be met.

Reason: To ensure that noise remains within acceptable levels in accordance with Policies Bicester 1 and ESD15 of the Cherwell Local Plan 2011-2031, Policy ENV1 of the Cherwell Local Plan 1996 and Government guidance contained within the National Planning Policy Framework.

This Noise Impact Assessment has been prepared to accompany a Reserved Matters application for Phase 2A of the Himley Village Development, comprising 123 residential units.

The assessment considers the potential noise impacts associated with the Proposed Development, with reference to the latest masterplan, in accordance with current Policy and guidance, and pursuant to Condition 14. The assessment findings and subsequent requirements for acoustic mitigation are set out herein.

Phase 2A of the Development is for residential use only therefore assessment of noise in accordance with Condition 15 is not applicable to this application.

1.2 Site Location

The Site is located to the north of the B4030, to the west of Bicester and currently comprises open land. To the north of the Site is open land, with an existing residential dwelling beyond, understood to be demolished as part of the wider masterplan. To the east of the Site is open land, beyond which is an existing industrial estate, and Howes Lane further beyond. To the south of the Site is open land with the B4030 beyond. To the west of the Site is also open land with the M40 beyond.

1.3 Technical Terminology

This report is technical in nature; therefore, a glossary of acoustic terminology is provided in **Appendix A** to assist in understanding this report.

2. METHODOLOGY

2.1 Overview

The assessment considers the following potential impacts:

- The impact of existing road traffic noise on Proposed Sensitive Receptors (PSRs), pursuant to Condition 14;
- The impact of existing industrial noise on PSRs; and,
- The impact of proposed ancillary plant at Existing Sensitive Receptors (ESRs) and PSRs.

The assessment also includes the following embedded mitigation measures:

- Close boarded fencing between dwellings and external living areas as shown in drawing: DRWG: P22-3093_DW_101_B_01, provided by Pegasus for Cala Homes; and,
- Existing 3m high bund along the eastern boundary of the strategic site, adjacent to the industrial estate to the east.

All close boarded fencing should have no holes or gaps, and should at a minimal surface density of 15kg/m^2.

2.2 Consultation with Local Planning Authority

The proposed noise survey and assessment methodology was sent to Cherwell District Council (CDC) on 5th April 2023.

Mr. Neil Whitton, Environmental Protection Officer, responded on the 5th April 2023, confirming that the methodology was acceptable, and that it was appropriate to amend the methodology with respect to BS4142 given the evolving situation at the Site since outline consent was granted.

2.1 Policy, Standards and Guidance

The assessment carried out considers the following policy, standards and guidance documents:

- National Planning Policy Framework, 2021 (NPPF);
- Noise Policy Statement for England, 2010 (NPSE);
- Planning Practice Guidance – Noise, 2021 (PPG);
- The World Health Organisation's Guideline for Community Noise, 1999 (WHO);
- British Standard 8233: 2014 – Guidance on Sound Insulation and Noise Reduction for Buildings (BS8233);
- British Standard 4142:2014 + A1 2019 - Methods for rating and assessing commercial and industrial sound (BS4142);
- Building Regulations Approved Document O: Overheating, 2021 (ADO); and,
- ANC, IOA: Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O, 2022.

A review of the relevant planning policy, standards and guidance is found in **Appendix B.**

2.2 Acoustic Survey

A noise survey has been carried out to support the assessment. The full details of the survey are set out **Section 3** of this report.

2.3 Acoustic Modelling

Environmental noise modelling has been carried out using the software SoundPLAN V8.2, which uses OS mapping and OS terrain data to create a 3D study area of the Site and surrounding areas. Details of the Proposed Development, embedded mitigation and associated sources of noise have been integrated into the model to inform the predicted level of noise at receptor locations. The assumptions for the assessment and model are set out within **Appendix C**.

2.4 Sensitive Receptors

This assessment considers the potential impact at sensitive areas of the Proposed Development. Three specific PSRs have been considered within the industrial noise impact assessment section. The location of PSRs are illustrated on **Figure 1**

3. NOISE SURVEY

3.1 Survey Overview

Two noise surveys have been carried out at the Site to collate the required level of information for assessment:

- Between Monday 3rd and Tuesday 4th April 2023; and,
- Between Wednesday 12th and Thursday 13th April 2023.

Noise measurements were carried out using Class 1, integrating sound level meters. The microphones were positioned vertically on a tripod at least 1.2m above the ground and at least 3.5m from any other reflecting surfaces. The sound level meters were calibrated to a reference level of 94 dB at 1kHz both prior to, and on completion of, the noise survey. No significant drifts in calibration were noted during the survey (≤ 0.5 dB).

Monitoring Locations (MLs) are detailed in **Table 1** and are illustrated on **Figure 2**.

Table 1: Noise Monitoring Locations

Monitoring Location	Location	Time Period	
		Start	End
ML1	Unattended monitoring was carried out at the southern boundary of the site, approximately 8m from the B4030. This location is representative of road traffic noise generated by the B4030.	12/04/2023 2315hrs	13/04/2023 1315hrs
ML2	Unattended monitoring was undertaken in the north western part of the site. This location is representative of distant road traffic noise generated by the M40, as well as representing background sound levels across most of the Site, being located away from industrial noise to the east and road traffic to the south.	03/04/2023 1145hrs	04/04/2023 1215hrs
ML3	Partially attended monitoring was carried out at the eastern boundary of the site, to assess noise from the industrial estate at noise sensitive receptors.	12/04/2023 2330hrs	13/04/2023 1100hrs
ML4	Attended monitoring was undertaken to the east of the site, approximately 4m from Howes Lane. Measurement at this location was undertaken for 3 hours, in accordance with the shortened measurement methodology outlined in Calculation of Road Traffic Noise (CRTN).	03/04/2023 1100hrs	03/04/2023 1400hrs

Additional, short-term, spot measurements were carried out between Wednesday 12th and Thursday 13th April, to establish specific sound levels associated with existing industrial noise sources, in support of the BS4142 assessment. These sound sources are discussed in more detail in **Section 5**.

3.2 Summary of Existing Noise Environment

Observations made during the survey and a review of audio recordings made during unattended measurements identified the following significant noise sources contributing to the noise climate at the site.

Road Traffic: Road traffic is the dominant source across the site, during both the daytime and the night-time periods. Noise is audible from the B4030, Howes Lane (A4095) and also the M40, to the west.

Industrial Noise: Industrial noise from operations at Menu Chef was audible in the eastern part of the Site. It was audible on occasion, and not dominant, in the central part of the Site.

Other Sources: Bird song and wildlife noise were regularly audible and occasionally dominant across the site during the daytime and night time period. Bird song was particularly dominant at ML2 during the early morning period.

3.2.1 Weather Conditions

All noise monitoring took place during conducive conditions, with wind speeds less than 5ms^{-1} (for the majority of the time) with no significant precipitation. No microphone distortion has been identified as a result of weather conditions.

The approximate weather conditions were observed as follows:

Monday 3rd and Tuesday 4th April 2023:

- Dry
- Partial cloud cover
- Winds between 2 and 4ms^{-1}, with intermittent gusts at 5ms^{-1}
- Temperature ranging between 7°C and 13°C

Wednesday 12th and Thursday 13th April 2023:

- Dry
- Partial cloud cover
- Winds <5ms^{-1} with intermittent gusts >5ms^{-1}
- Temperature ranging between 4°C and 12 °C

3.3 Summary of Existing Noise Levels

Measured noise levels at each ML have been separated in to daytime (0700 to 2300 hours) and night-time (2300 to 0700 hours) categories, in accordance with current guidance, where appropriate.

Noise measurements were carried out throughout the entire night-time period at ML1 and ML3 therefore this average level has been presented below. Noise levels were only measured for a proportion of the daytime period, however. This period includes the peak transportation periods during the daytime i.e. 0700-1000hrs. The average daytime noise levels have been presented below but also validated using the shortened CRTN and TRL method at ML1.

Noise levels were measured at ML4 in accordance with the shortened measurement procedure of CRTN. A measurement was carried out for three consecutive hours between 1000 and 1700hrs, to

allow conversion to daytime $L_{Aeq, 16hours}$ and night-time $L_{Aeq, 8hours}$ levels in accordance with the TRL method.

A summary of measured noise levels is provided in Error! Reference source not found.**2**, and are set out in full in **Appendix D**.

Table 2: Summary of Average Daytime and Night-time Noise Levels

Monitoring Location	Time Period	Measured Ambient Noise Level, $L_{Aeq,T}$ dB
ML1	07:00 - 23:00 23:00 - 07:00	68 61
ML2[1]	07:00 - 23:00 23:00 - 07:00	48 44
ML3	07:00 - 23:00 23:00 - 07:00	58 53
ML4	07:00 - 23:00 23:00 - 07:00	75 66

[1] Noise from bird song has been omitted during the night-time period.

Typical night-time maxima have been established based on WHO, BS8233 and ProPG, where any L_{AFmax} levels associated with events which are not considered to be typical have been eliminated. The typical measured night-time maximum noise levels at each ML are summarised in **Table 3**.

Table 3: Summary of Maximum Nigh-time Noise Levels

Monitoring Location	Typical Night-time L_{AFmax} dB
ML1	81
ML2	55
ML3	65
ML4[2]	90

[2] Established from typical maximum noise levels during the daytime period to form a robust assessment.

4. TRANSPORTATION NOISE IMPACT ASSESSMENT

The impact of road traffic noise on the surrounding road network has been considered at PSRs in accordance with BS8233 and WHO, pursuant to **Condition 14** of the Decision Notice.

The results of the survey have been used to predict noise levels across the site during the daytime and night-time periods using SoundPLAN 8.2.

4.1 Noise Levels in Outdoor Living Areas

External noise levels have been predicted across the site during the daytime period, with the inclusion of 1.8m high close boarded garden fencing (embedded mitigation), as illustrated in **Figure 3**.

The predicted noise levels within the majority of private gardens are below the lower 50dB(A) guideline level, with but the remainder of gardens below 55dB(A), the upper guideline level, recommended by BS8233 and WHO.

Noise impacts in outdoor living areas are therefore considered to be low, and no specific mitigation is required.

4.2 Noise Levels within Habitable Rooms

Predicted noise levels are shown at each façade of the development on the following figures:

- **Figure 4** – Average daytime façade levels $L_{Aeq, 16hour}$ dB;
- **Figure 5** – Average night-time façade levels $L_{Aeq, 8hour}$ dB; and,
- **Figure 6** – Night-time maximum façade levels L_{AFmax} dB.

Based on the predicted noise levels, each façade of the Proposed Development has been allocated a Façade Noise Exposure Category. which is proportional to the required degree of attenuation, and requirement for mitigation.

A summary of the façade noise exposure categories, and the required noise attenuation (level difference) to achieve suitable internal ambient noise levels, in accordance with BS8233 and WHO guidance, is set out in **Table 4**.

Table 4: Noise Exposure Categories & Attenuation Requirements

Façade Noise Exposure Category		Required Level Difference, D_w
	Low	<15dB
	Moderate	15-35dB
	High	>35dB

Noise levels at façades across the majority of the site at the **Low** noise exposure category during both the daytime and night-time period. This indicates that no specific mitigation measures are required across the majority of the site and windows may be opened for background ventilation purposes.

Noise levels at facades facing the south and east, together with facades facing west, closest to and with a direct line of sight to the B4030, B3030 and the M40, are within the **Moderate** noise exposure category during the daytime and night-time periods. Therefore, standard glazing is

required, together with an alternative background ventilation strategy, to allow windows to remain closed to mitigate noise whilst still achieving the appropriate ventilation rates.

The façade insulation requirements are set out in **Section 6** of this report.

5. INDUSTRIAL NOISE IMPACT ASSESSMENT

5.1 Overview

Since outline consent was granted for the wider scheme, there is now extant industrial use to the east of the Site, off Empire Road. Therefore, the potential for industrial noise impacts at PSRs is considered as part of this assessment, in accordance with BS4142.

There are a total of 14 industrial units to the east of the Site, which are permitted to operate under B2, B8 and E(g) planning class use.

Several of the units were noted to generate noise during the noise survey, with noise from 'The Menu' (Unit 14), located adjacent to the eastern strategic site boundary approximately 350m away from the Phase 2A boundary, identified to be the prevailing industrial source at the Site. A summary of the units' operations and associated sound sources have been provided in **Appendix E.**

Some units were identified to be unoccupied during the survey. Therefore, in order to provide a complete assessment of potential impacts, reasonable assumptions have been made for unoccupied units based on experience with similar schemes, according to their class use.

Noise predictions of the industrial units have been carried out using SoundPLAN V8.2. Sound sources have been defined in the model using specific levels measured at source during the survey, or using Hydrock archive data noise data from representative sources in the absence of site-specific data. Predictions have been validated using the long term ambient and specific measurements at the Site boundaries, where appropriate.

5.2 Assessment of Industrial Noise

This BS4124 assessment considers the potential for cumulative industrial noise impacts during the daytime and night-time period at PSRs, which have been selected based on their proximity to the industrial estate. The PSR locations are shown in **Figure 1**.

During the daytime impacts have been considered at external areas which are considered to be sensitive to industrial noise i.e. private gardens. Industrial noise levels at external areas which do not constitute amenity spaces are not considered to be relevant when evaluating the potential for adverse impacts as these areas are not considered to be sensitive to noise.

Potential daytime and night-time impacts have also been considered internally, in the appropriate context, in accordance with BS4142. Internal impacts are assessed using relevant guidance for internal noise, including BS8233 and WHO health-based guidance, in the Context Section of this assessment.

5.2.1 *Identification of Specific Sound Sources*

During the noise survey, a number of spot measurements were carried out to establish the specific level of each sound source, together with a subjective evaluation of the acoustic character. A summary of specific sound sources and measured levels are provided in **Table 5**, Where representative sound source information has not been obtained archive data has been used for this assessment.

Table 5: Summary of Specific Sound Sources and Levels

Sound Source	Approximate Distance & Bearing from Site	Approximate Source Height	Specific Sound Levels
Loading/Unloading Event (Covered Loading Dock)[1]	>400m East	2.5m	87dB L_{WA}
Accelerating HGV Engine[1]	>400m East	1m	96dB L_{WA}
Reversing HGV & Beeper[1]	>400m East	3m	98dB L_{WA}
Idling Engines[1]	>400m East	1m	85dB L_{WA}
Jet Wash (The Menu)	430m East	1.5m	95dB L_{WA}
Chillers (The Menu)	350m East	2m	97dB L_{wA}
HGV Chiller (The Menu)	450m East	2.5m	69dB L_{WA}
HVAC Plant[1]	Min. 300m East	2m	69dB L_{WA}
[1] Archive Data			

No significant noise was not observed to be emitted from the façade of the industrial units. This was supported by comments from the business owners who informed that the external fabric was of a 'robust design'. Noise break-out from the units has therefore not been included as a specific noise source in this assessment.

Car parking noise associated with the industrial units was not identified to be significant at the Site, and noise from HGV movements and deliveries associated with the units was observed to comprise the primary vehicle noise. No specific car parking noise sources have therefore been included in this assessment.

5.2.2 *Events & On-Time Corrections*

In accordance with BS4142, the specific sound level should be corrected to reflect the on-time duration over the respective reference assessment period (Tr), 1-hour daytime (0700-2300) and 15-minute night-time (2300-0700) i.e. where noise occurs for less time than the reference assessment period, the noise level should be adjusted appropriately.

Deliveries

Consideration has been given to the no. of delivery events associated with each unit at the Site within a typical reference assessment period. Each event relates to the import and/or export of goods, comprising noise from HGV movements on Site, including accelerating and reversing, loading noise, and idling engines.

A average vehicle speed of 5Km/h has been assumed, which is considered to provide a robust representation of sound pressure levels emitted from HGV activities associated with the industrial units (a lower average speed corresponds to a greater sound pressure level).

For units that are unoccupied or where there was no observed activity, assumptions have been made based on the size of the unit and number of delivery bays, in order to consider the potential impact if the units were leased by an alternative company and/or if the units were operational. A summary of the number of delivery events at each unit has been summarised in **Table 6**.

Table 6: Summary of Delivery Events

Unit	Delivery Events	
	Daytime	Night-time
Unit 1[1]	2	1
Unit 2 & Unit 3[2]	1	-
Unit 4[1]	1	1
Unit 5[1]	1	1
Unit 6	2	-
Unit 7 & Unit 8 [1] [2]	1	-
Unit 9 & Unit 10 [3]	-	-
Unit 11	1	-
Unit 12	1	-
Unit 13	4	2
Unit 14	4	2

[1] Assumed events under typical usage.
[2] Shared ownership.
[3] Additional assessment likely required for later phases.

The likelihood that all units will have an event within the same period is considered to be low, therefore, the above is considered to provide a robust representation of the average delivery activities associated with the industrial units.

It is considered that a single delivery event could occur for up to 30-minutes. Therefore on-time corrections have been applied accordingly for the reference assessment periods, based on the above observations and assumptions.

HVAC & Other

Chillers (HVAC) associated with The Menu unit were identified to operate continuously throughout the daytime and night-time, therefore no on-time correction has been applied.

The Menu's delivery vehicles were observed to park adjacent to Empire Road, with integrated chiller units running continuously. It's assumed that up to six of these chilled delivery vehicles have the potential to operate continuously during the daytime and night-time period, which is considered to provide a robust assessment.

The Menu unit also included a jet wash, which was only observed to operate during the daytime period only (night-time audio recordings have been reviewed). Based on observations, it's assumed that the jet wash could be used for up to 30-minutes in an hour period, therefore a 50% on-time has been applied.

In order to provide a robust assessment of Unit 13, adjacent to the eastern strategic site boundary, which was identified to be unoccupied, it's assumed that HVAC plant has the potential to be used at that Unit. Therefore, HVAC plant has been implemented into the model, to the rear of this unit in a similar configuration to The Menu unit. Similarly, this plant is assumed to operate continuously throughout the daytime and night-time, therefore no on-time correction has been applied.

5.2.3 *Identification of Background Sound Level*

A typical background sound level has been established by analysis of the L_{A90} noise levels measured at ML2, in the north-western part of the wider Site. This location is considered to be robust with respect to industrial noise impacts, which occur in the eastern part of the Site, closer to sources off-site noise sources.

The analysis comprises a comparison of the measured $L_{A90,15min}$ time history to the arithmetic average L_{A90} level. The arithmetic average level is then adjusted to establish a typical background level, so that an appropriate proportion of the measured background level exceeds the selected background level. This establishes a typical background level which will not be exceeded, for the majority of the time.

This analysis is presented in **Appendix F**, and a summary of the background sound levels used for the assessment are summarised in **Table 7**.

Table 7: Background Sound Levels During Assessment Periods

Receptor	Typical Background Sound Level, dB L_{A90}	
	Daytime	Night-Time
PSRs	40	37

5.2.4 *Acoustic Feature Corrections*

In accordance with BS4142 a correction should be applied to the specific sound level where it is perceived as tonal, intermittent, impulsive, or otherwise readily distinctive against the existing acoustic environment, at the receptor location.

At ML3, at the eastern boundary of the Phase 2A parcel and closest to sources of industrial noise, the level and character of the industrial noise is not considered to be significant or readily distinctive over the existing residual sound. Therefore, no acoustic feature correction should be applied.

In the interest of providing a robust assessment, however, a + 3dB correction has been allowed for. This correction is appropriate for when a sound source is considered readily distinctive against the existing acoustic environment.

5.2.5 *Embedded Mitigation*

Calculations include the standard 1.8m high close boarded fencing between external living areas, and the existing a 3m high earth bund across the boundary of the strategic site with the adjacent industrial estate.

5.2.6 Exceedance of Rating Level over Background Level in Outdoor Living Areas

The exceedance of the rating level over the daytime background sound level has been assessed in private gardens of PSRs, closest to the eastern part of the Phase 2A parcel, and 1.5m above ground, in accordance with BS4142. The propagation of noise from the estate is illustrated in **Figure 7**, and a summary of the assessment has been provided in **Table 8**.

Table 8: Comparison of the Rating level and Daytime Background Sound Level

Description	Assessment Period		
	Daytime		
	PSR1	PSR2	PSR3
Specific Sound Level (including on-time correction) dBA	23	20	21
Application of Rating Penalty	+3	+3	+3
Rating Level	26	23	24
Background Sound Level	40	40	40
Excess of Noise Rating over the Background Sound Level	-14	-27	-16

The rating level is predicted to be less than the typical daytime background sound level within private gardens of dwellings represented by PSR1 to PSR3. This provides a good indication of '**Low**' impact, depending on context, in accordance with BS4142.

5.2.7 Assessment of Impacts in Context

BS4142 states:

> *"The significance of a 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. To determine the context in which the proposed industrial sound will reside, three factors must be considered, these are:

5.2.7.1 The Absolute Level of Sound

The typical daytime background level measured at ML3 is 40dB(A) and the rating level has the potential to be up to 26dB(A) at the most exposed PSR. These levels are considered to be low in relation to the upper and lower guideline external levels of 55dB(A) and 50dB(A) recommended by BS8233 and WHO health-based guidance.

As both the background and rating levels are relatively low during the daytime, the initial impact for the given exceedance of the rating over background level is reduced, in accordance with BS4142.

5.2.7.2 *The Character and Level of the Residual Compared to the Character and Level of the Specific Sound*

The residual sound level is significantly higher than specific sound level during the daytime period by at least 25dB. Industrial noise will therefore be less distinguishable, in terms of its level, over the residual sound level, within outdoor living areas.

Noise from the HGV movements is similar spectral character to the residual sound i.e. distant road traffic, as is existing plant noise, which is relatively broad-band in nature based on the results of the survey. The character of reversing alert systems, and loading/unloading, however, contrasts the residual sound, due to the intermittent, temporal, and tonal characteristics, however it these elements of industrial noise make up a relatively small contribution to the overall sound.

In summary, some industrial sources will be in contrast due to their character, however the level is significantly less than the residual sound, therefore the sources are unlikely to be incongruous to the residual acoustic environment.

Therefore, the initial impact for the given exceedance of the rating over background level is reduced, in accordance with BS4142.

5.2.7.3 *The Sensitivity of the Receptor*

External Impacts

Private gardens are considered to be of high sensitivity. Occupants of dwellings may expect to use their gardens as a means to access private, relatively quiet external amenity. Therefore, there is little tolerance with respect to adjusting the magnitude of impacts.

Internal Impacts

Industrial noise impacts should be considered internally within habitable rooms, which are highly sensitive. However, BS4142 highlights that the standard is not intended to be applied to the assessment of indoor sound levels. It instead recognises that the sensitivity of proposed residential premises can be reduced, and that good internal acoustic conditions can be achieved, via the implementation of design measures including acoustic barriers, façade insulation and ventilation strategy.

Furthermore, BS4142 states:

> *"Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognised that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation."*

With regards to this, PPG states:

> *'Consideration should also be given to whether adverse internal effects can be completely removed by closing all windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary '.*

This indicates that, providing façade insulation and ventilation is an acceptable method to remove noise impacts.

To determine the potential for impact and whether there would be a requirement for façade insulation, octave band noise levels associated with industrial sources have been predicted at proposed facades, and assessed within habitable rooms against the recommended noise levels in BS8233, and the respective Noise Rating (NR) criterion, This method is generally accepted as

appropriate for considering the full octave band spectrum of industrial noise impacts within dwellings, and accords with the contextual considerations recommended by BS4142

NR30 generally represents a good standard for internal noise levels within living rooms and bedrooms during the daytime and night-time period, which is approximately equivalent to 35dB $L_{Aeq, T}$ recommended by BS8233, but in practice is typically lower.

Similarly, NR25 generally represents a good standard for internal noise levels within bedrooms during the night-time period, and corresponds to an internal level approximately equal 30 dB $L_{Aeq, T}$ guideline value, recommended by BS8233, but in practice is typically lower.

The highest specific noise level at the façade of the PSRs is 33dB(A). Therefore, appropriate internal noise levels be achieved with windows open, in accordance with BS8233 and WHO guidance, during the daytime and night-time period, assuming a broadband reduction of 15dB.

However, proposed dwellings closest to industrial noise sources require façade insulation in the form of closed windows and alternative background ventilation, to mitigate road traffic noise, as discussed in Section 4. Comparison of the internal noise levels against the NR criteria has been carried out in this scenario also.

A summary of NR calculations carried out as part of this assessment are presented in **Appendix G**. NR calculations include one open window scenario and one standard glazing closed window scenario, at the worst affected dwellings. Both assessments demonstrate that noise levels would be below the NR25 criteria within habitable rooms, indicating that impacts would be low during the daytime and night-time periods.

Further information on the glazing and ventilation scheme is provided in **Section 7**.

5.2.8 Summary of Impacts

The results of the BS4142 assessment indicate that the noise impact would be low in private gardens across the Site, therefore there are no required for specific external noise mitigation, in relation to industrial noise.

The results of the assessment indicate that industrial noise impacts would be acceptable at internal noise sensitive locations with open windows. However, future occupants have the ability to remove any potential adverse impacts within habitable rooms by closing the windows, while maintaining sufficient background ventilation.

A standard glazing and ventilation strategy has been outlined in **Section 7.**

5.3 Noise from any Ancillary Plant

The Proposed Development may include fixed plant At this stage, information relating to any ancillary plant is unavailable.

In the absence of this information atmospheric noise rating level limits have been determined which would ensure any potential adverse noise impacts from proposed ancillary plant can are avoided.

It is considered that the daytime and night time L_{90} background sound levels at ML2 are representative of levels at ESRs and PSRs for the purposes of this assessment, and therefore rating level limits have been formed based on the typical background sound level at this location, less 5dB. The recommended rating level limits are set out in **Table 9.**

Table 9: Atmospheric Plant Level Limits

Period	Background Sound Level	Rating Level Limit ($L_{Ar,T}$, dB)
Daytime (07:00 to 23:00 hrs)	40	35
Night-time (23:00 to 07:00 hrs)	37	32

Noise from ancillary plant should be controlled to these noise limits where possible at sensitive receptor locations to minimise the potential for adverse impacts when assessed in accordance with BS4142.

In accordance with BS4142, the magnitude of impact depends upon the context, and not only upon the comparison of rating and background noise levels, therefore these levels are intended to provide a guideline. Any planning condition requiring the assessment of noise against these levels should be worded to take account of BS4142 in full.

6. NOISE DURING OVERHEATING CONDITIONS ASSESSMENT

6.1 Noise Assessment

The Building Regulations Approved Document Part O (ADO) for England is now in effect and applies to new-build residential developments.

ADO requires rooms for residential purpose to limit unwanted solar gain and provide an adequate means to remove heat from the building, with the safety of the occupant and their reasonable enjoyment of the residence being taken into account, pursuant to requirement O1(2A). To satisfy this requirement ADO prescribes internal night-time noise limits for bedrooms, and is applicable to all transportation and industrial noise sources.

A summary of internal noise levels prescribed by ADO is provided in **Table 10**, together with the corresponding external façade noise level, as recommended by the ANC and IOA, which recommends that an assumed 9dB attenuation through an open window should be adopted, due to windows having the potential to be open wider during overheating conditions than for background ventilation conditions.

Table 10: Approved Document O Internal Noise Levels and Corresponding Façade Levels

ADO Internal Night-time Noise Level Criteria	Corresponding External Façade Level with Windows Open[1]
40dB $L_{Aeq,8hour}$	49dB $L_{Aeq, 8hour}$
55dB L_{AFmax}[2] ,	64dB L_{AFmax}

[1] Based on the ANC and IOA's ADO guidance note, which prescribes façade noise levels for proposed dwellings at 'Moderate Risk Locations' (with respect to high external ambient temperatures).

[2] Not to be exceeded more than 10 times per night (2300 to 0700)

Average and maximum night-time façade noise levels attributed to both transportation and industrial noise sources are illustrated on **Figure 8** and **Figure 9**.

For dwellings where facade noise levels exceed the 49dB $L_{Aeq, 8hour}$ on **Figure 4** and 64dB L_{AFmax} on **Figure 5**, there is a requirement to consider an alternative means of overheating mitigation which allows windows not to be opened fully, so that suitable internal noise levels and thermal comfort can be secured simultaneously, in accordance with ADO.

Since the internal noise levels are predicted to exceed the criteria with windows open at the most exposed dwellings, compliance with the requirement of ADO cannot be carried out with the Simplified Method prescribed by ADO.

The requirement to keep windows closed to maintain suitable internal noise levels at dwellings across the Site, and the potential methods to purge heat, in accordance with AVO and ADO, are set out in **Section 7**.

6.2 Overheating and Noise Design Guidance

For design guidance, it is advised that the "geometric open area" of **bedroom** windows on critical facades should not exceed 2.5% of the floor area at night. (Please note this not the "equivalent area", as typically referred to in background ventilation terms).

The maximum geometric open area outlined above would provide approximately 12dB sound reduction. This is required in order to meet upper internal night-time AVO Guide values of 42 dB $L_{Aeq,8hr}$ and 65 dB $L_{Amax,F}$.

The above measures should be confirmed acceptable by a suitably qualified thermal modelling engineer. If it is not sufficient, an alternative means of controlling overheating is likely to be required.

Any detailed overheating assessment should be carried out to all plots within the development site.

Note: This assessment has been carried out to bedrooms of the most critical plots within the proposed development site, located closest to the road and industrial sound sources. It is likely that plots situated further back from the road, with lower external ambient noise levels, are at a reduced noise risk. This can be reviewed at a later stage, as part of a more detailed overheating assessment, if required.

7. MITIGATION REQUIREMENTS

7.1 External Mitigation Requirements

Noise levels are predicted to be below the recommended criteria in BS8233 in outdoor living areas with the provision of standard 1.8m high close boarded fencing around the plots, therefore satisfying the outdoor noise levels requirements in **Condition 14**.

Industrial noise impacts are also predicted to be '**Low**' in accordance with BS4142 in outdoor living, also with the provision of standard 1.8m high close boarded fencing.

This scheme of mitigation should be implemented in full to reduce the potential for noise impact external amenity areas across the Site, as described in this assessment.

All close boarded fencing should have no holes or gaps, and should at a minimal surface density of 15kg/m^2.

7.2 Façade Insulation Requirements

Façade insulation is required in the form of glazing and alternative ventilation to achieve suitable internal noise conditions in accordance with BS8233 and WHO, in accordance with the requirements of **Condition 14**, and also to mitigate the potential for industrial noise impact.

In order to determine the requirements for façade insulation noise break-in calculations have been carried out in accordance with the 'more rigorous' method outlined in BS12354-3, using the predicted noise and spectrum at facades,

When carrying out internal noise level predictions, in the absence of design details, the following assumptions have been made:

- Windows are closed;
- Background ventilation rates will be supplied via alternative ventilation (passive or mechanical);
- A reverberation time of 0.5 seconds in habitable rooms;
- 40% glazed façade area;
- The composite wall system, i.e. Masonry/cladding external leaf with internal dry lining, will provide a sound reduction performance ($R_w + C_{tr}$) at least 5dB greater than the specified glazing;
- Ventilation openings in the façade to have a nominalised weighted element difference ($D_{n,e,w}$) 5dB higher than the specified ($R_w + C_{tr}$) of the glazing; and,
- Any self-generated MVHR noise will be suitably attenuated.

The preliminary glazing and ventilation sound reduction performances, for each façade noise exposure category, are summarised in **Table 11**.

Table 11: Preliminary Acoustic Specification for the Development

Façade Noise Exposure Category	Preliminary minimum sound reduction performance (dB)		Example Glazing & Ventilation Configuration
	Glazing ($R_w + C_{tr}$)	Ventilation ($D_{n,e,w} + C_{tr}$)	
1	N/A	N/A	» N/A
2	30	35	» 10/ (6-16)/ 4 Glazing » Passive ventilation/MVHR

A façade mark-up of the illustrative layout has been provided corresponding to the exposure categories in **Figure 10.**

Alternative glazing and ventilation products to the configurations provided in **Table 10** may be implemented providing the R_w and $D_{n,e,w}$ are equal to or greater than the performance specified.

The guidance contained herein is therefore subject to development during the detailed design and should not be used for tender purposes.

7.3 Ventilation and Overheating

Noise Levels have been assessed at the facades of the proposed dwellings based on the ADO internal ambient noise levels requirements, and the level of attenuation provided by an open window providing sufficient effective free area to purge heat, based on ANC and IOA guidance.

At proposed facades most exposed to noise, windows would need to remain closed (or not fully open) in order to achieve ADO internal ambient noise levels, therefore an alternative overheating strategy to fully open windows alone may be required, depending on the likelihood of overheating.

A mark-up of proposed facades where an alternative overheating strategy requires further consideration, in accordance with ADO, is provided on **Figure 11**.

For dwellings associated with the facades highlighted, the design team should consider how heat will be adequately purged from the building, while allowing windows to remain closed. A strategy is required to demonstrate compliance with ADO.

To mitigate the potential for an overheating condition, the following should be considered during the detailed design:

- Whether in the dwelling/unit there is allowance for cross-ventilation;
- Facilities to increase ventilation rates i.e. operatable MEV/MVHR boost;
- Solar screening/shading;
- Solar control glazing (lower G value);
- Provision of thermal mass, high ceilings and fans; and,
- Mechanical cooling.

In accordance with ADO mechanical cooling should only be used where insufficient heat is capable of being removed from the indoor environment without it.

9. CONCLUSION

Hydrock has carried out a noise assessment to accompany a Reserved Matters application for Phase 2A of the wider Himley Village Development.

An assessment has been carried out to identify how the existing acoustic noise climate will impact the sensitive areas of the Proposed Development, in accordance with the requirement of **Condition 14**, and also to consider the impact of the industrial estate to the east.

A survey has been carried out at and around the Proposed Development Site to establish typical baseline conditions. The survey results have been used calibrate a 3D noise model of the Site and surrounding area using SoundPLAN V8.2.

The results of the assessment indicate that the external guideline noise levels recommended in BS8233 and WHO can be achieved across most of the Site with standard 1.8m high close boarded fencing. Impacts in external living areas are therefore predicted to be low and as such there are no additional requirements to mitigate road traffic noise at external living areas.

The results indicate that the internal BS8233 and WHO guideline noise levels can be achieved with the use of adequate façade insulation, the recommendations for which have been set out within this report.

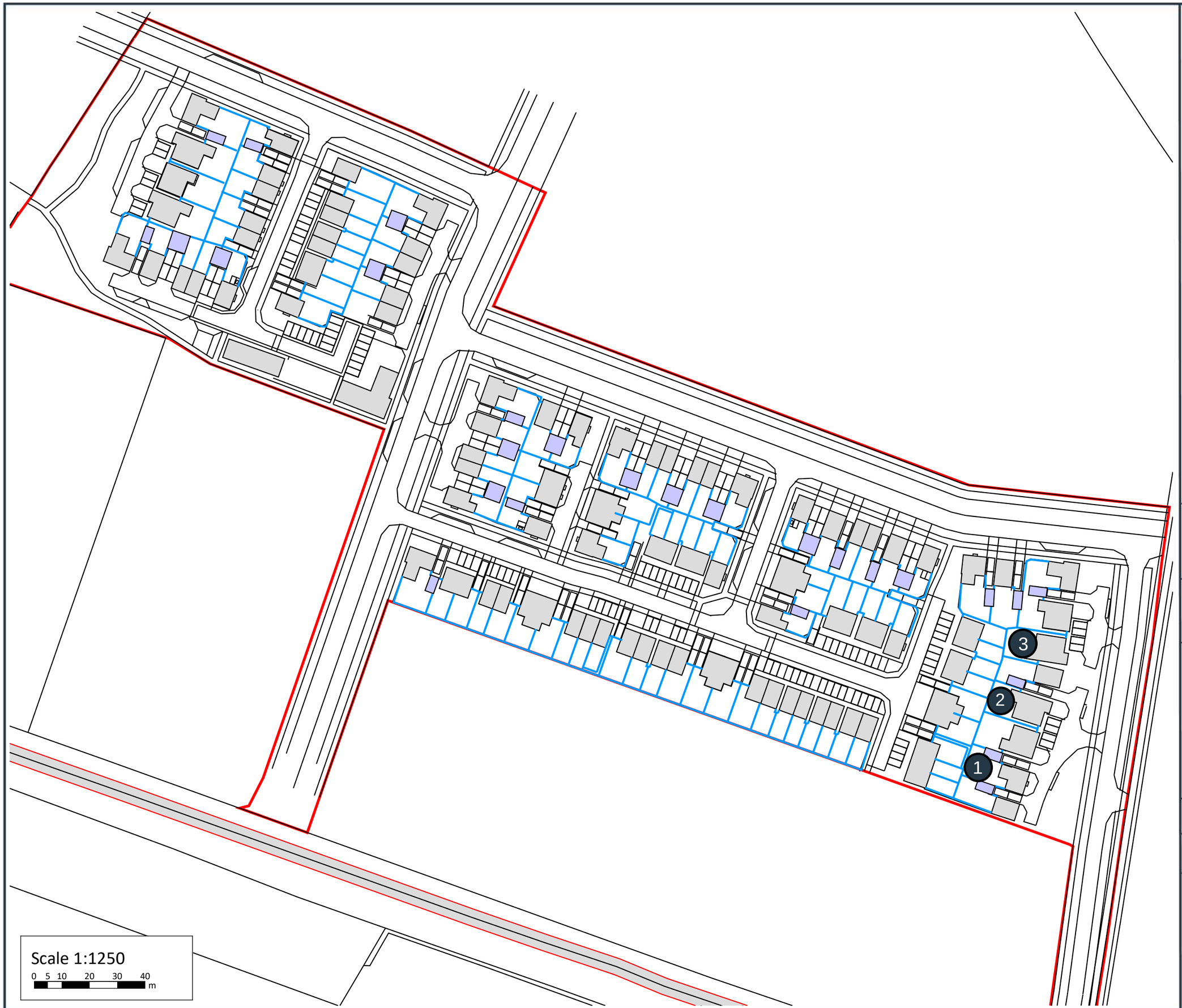
The recommendations for mitigation herein are considered sufficient to support the discharge of **Condition 15**.

Industrial noise impacts from the existing industrial estate to the east have been considered at the sensitive areas of the Proposed Development in accordance with BS4142. The assessment found that impacts would be '**Low**' at external noise sensitive locations, also with standard 1.8m high close boarded fencing around the externa living areas. Impact at internal noise sensitive locations are also predicted to be low, even with an open window. However, with provision of the standard glazing and ventilation strategy provided to mitigate the impact of road traffic, the potential for industrial noise impacts can be completely removed. There are therefore no additional requirements to mitigation industrial noise impacts.

Specific noise limits for ancillary plant have been established to reduce the potential for an adverse noise impact at existing and proposed sensitive receptors.

When considering overheating and noise, the assessment indicates that windows will need to remain closed on some facades so that the internal ADO criteria are not exceeded. Therefore, an alternative strategy on how heat will be removed from these dwellings, with windows closed, will be required, depending on the likelihood of overheating, to demonstrate compliance with The Building Regulations.

It is considered that this assessment indicates that the Proposed Development is acceptable on acoustics grounds.



Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- ROAD AXIS
- PROPOSED SENSITIVE RECEPTOR

Client

CALA HOMES (COTSWOLDS) LTD

Project

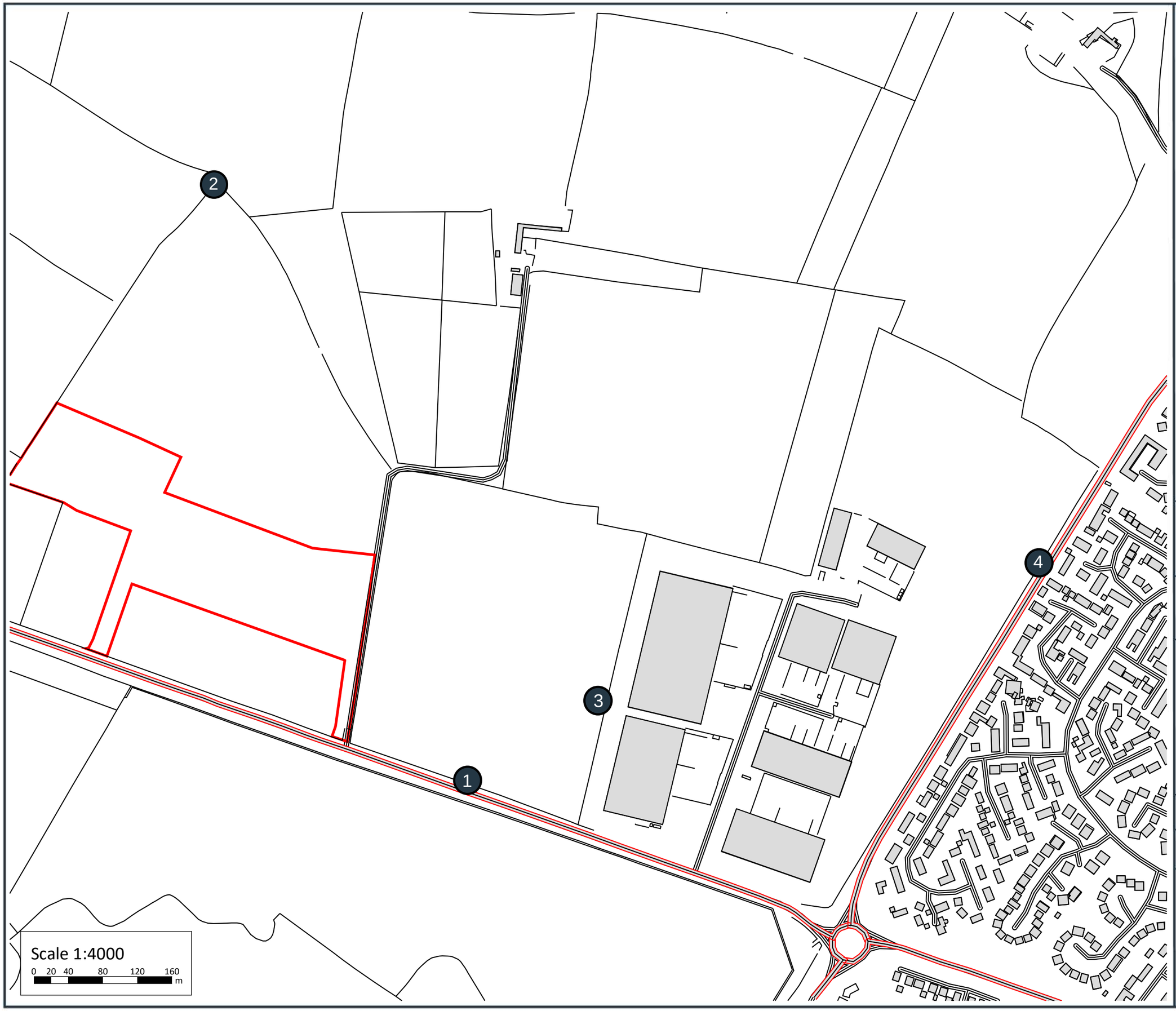
HIMLEY VILLAGE

Title

PROPOSED SENSITIVE RECEPTORS

Figure	Date		
FIGURE 1	31/05/2023		
Revision	Scale	Drawn	Approved
P01	1:1250	JS	EG

Hydrock



Legend

- SITE BOUNDARY
- EXISTING BUILDINGS
- X MONITORING LOCATIONS

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

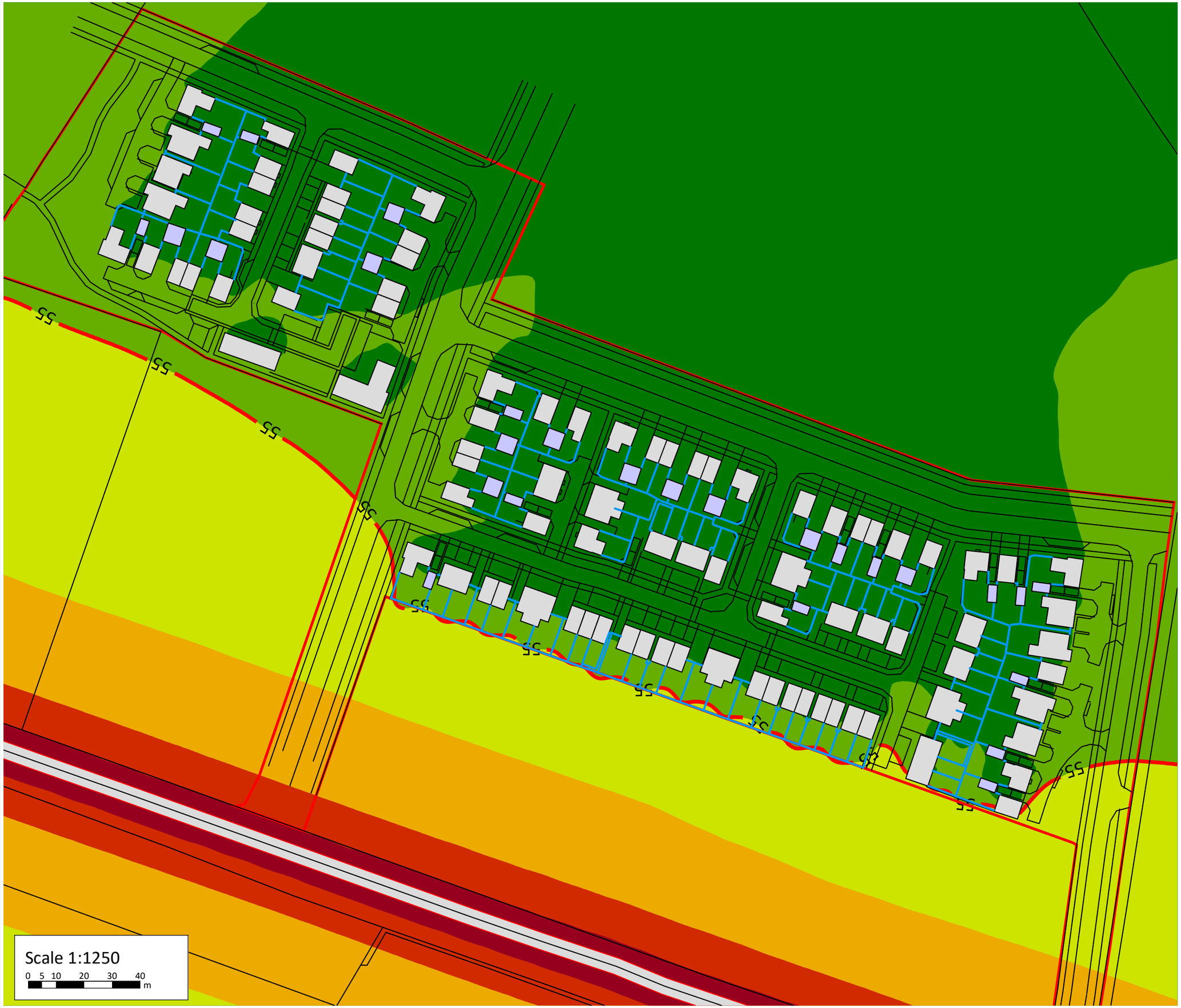
Title

MONITORING LOCATIONS

Figure	Date
FIGURE 2	31/05/2023

Revision	Scale	Drawn	Approved
P01	1:4000	JS	EG

Hydrock



Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- FACADE NOISE LEVEL
- ROAD AXIS

Daytime $L_{Aeq,16hour}$, dB

	<	50.0
50.0 <=	<	55.0
55.0 <=	<	60.0
60.0 <=	<	65.0
65.0 <=	<	70.0
70.0 <=		

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

Title

EXTERNAL NOISE LEVELS - DAYTIME

Figure	Date		
FIGURE 3	31/05/2023		
Revision	Scale	Drawn	Approved
P01	1:1250	JS	EG

Hydrock

Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- FACADE NOISE LEVEL
- ROAD AXIS

Daytime $L_{Aeq,16hour}$, dB

	<	50.0
50.0 <=	<	70.0
70.0 <=		

Scale 1:1250

0 5 10 20 30 40 m

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

Title

FACADE NOISE LEVELS - DAYTIME

Figure	Date		
FIGURE 4	31/05/2023		
Revision	Scale	Drawn	Approved
P01	1:1250	JS	EG

Hydrock

Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- FACADE NOISE LEVEL
- ROAD AXIS

Night-time $L_{Aeq,8hour}$, dB

	<	45.0
45.0 <=	<	65.0
65.0 <=		

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

Title

FACADE NOISE LEVELS - NIGHT-TIME

Figure	Date		
FIGURE 5	31/05/2023		
Revision	Scale	Drawn	Approved
P01	1:1250	JS	EG

Hydrock

Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- FACADE NOISE LEVEL
- ROAD AXIS

Night-time Max L_{AFMax}, dB

	<	60.0
60.0 <=	<	80.0
80.0 <=		

Scale 1:1250

0 5 10 20 30 40 m

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

Title

FACADE NOISE LEVELS - NIGHT-TIME MAX

Figure	Date
FIGURE 6	31/05/2023

Revision	Scale	Drawn	Approved
P01	1:1250	JS	EG

Hydrock

Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- EXISTING BUND - 3M
- ROAD AXIS
- LINE SOURCE
- POINT SOURCE

Daytime $L_{Aeq,1hour}$, dB

		<	30.0
30.0	<=	<	35.0
35.0	<=	<	40.0
40.0	<=	<	45.0
45.0	<=	<	50.0
50.0	<=	<	55.0
55.0	<=	<	60.0
60.0	<=		

Scale 1:2000

0 10 20 40 60 80 m

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

Title

EXTERNAL NOISE LEVELS - INDUSTRIAL DAYTIME

Figure	Date		
FIGURE 7	31/05/2023		
Revision	Scale	Drawn	Approved
P01	1:2000	JS	EG

Hydrock

Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- FACADE NOISE LEVEL
- ROAD AXIS

Night-time $L_{Aeq,8hour}$, dB

<= 49.0

49.0 <

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

Title

FACADE NOISE LEVELS - NIGHT-TIME

Figure	Date		
FIGURE 8	31/05/2023		
Revision	Scale	Drawn	Approved
P01	1:1250	JS	EG

Hydrock

Legend

- SITE BOUNDARY
- PROPOSED DWELLING
- PROPOSED AUXILARY BUILDING
- ACOUSTIC SCREEN 1.8M
- FACADE NOISE LEVEL
- ROAD AXIS

Night-time Max L_{AFMax}, dB

64.0 < <= 64.0

Client

CALA HOMES (COTSWOLDS) LTD

Project

HIMLEY VILLAGE

Title

FACADE NOISE LEVELS
- CUMULATIVE NIGHT-TIME MAX

Figure	Date
FIGURE 9	31/05/2023

Revision	Scale	Drawn	Approved
P01	1:1250	JS	EG

Hydrock

KEY PLAN

SPECIFICATION 1

SPECIFICATION 2

NOTES

REFER TO NOISE IMPACT ASSESMENT FOR GUIDANCE.

DO NOT USE FOR TENDERING PURPOSES.

REVISIONS

REV.	REVISION NOTES/COMMENTS					
P01	FIRST ISSUE EXAMPLE					
	J SCHOFIELD	01/06/23	E. GOLDSMITH	01/06/23		

Hydrock
Northern Assurance Building
9-21 Princess Street
Albert Square
Manchester
M2 4DN

CLIENT

CALA HOMES (COTSWOLD) LTD

PROJECT

HIMLEY VILLAGE

TITLE

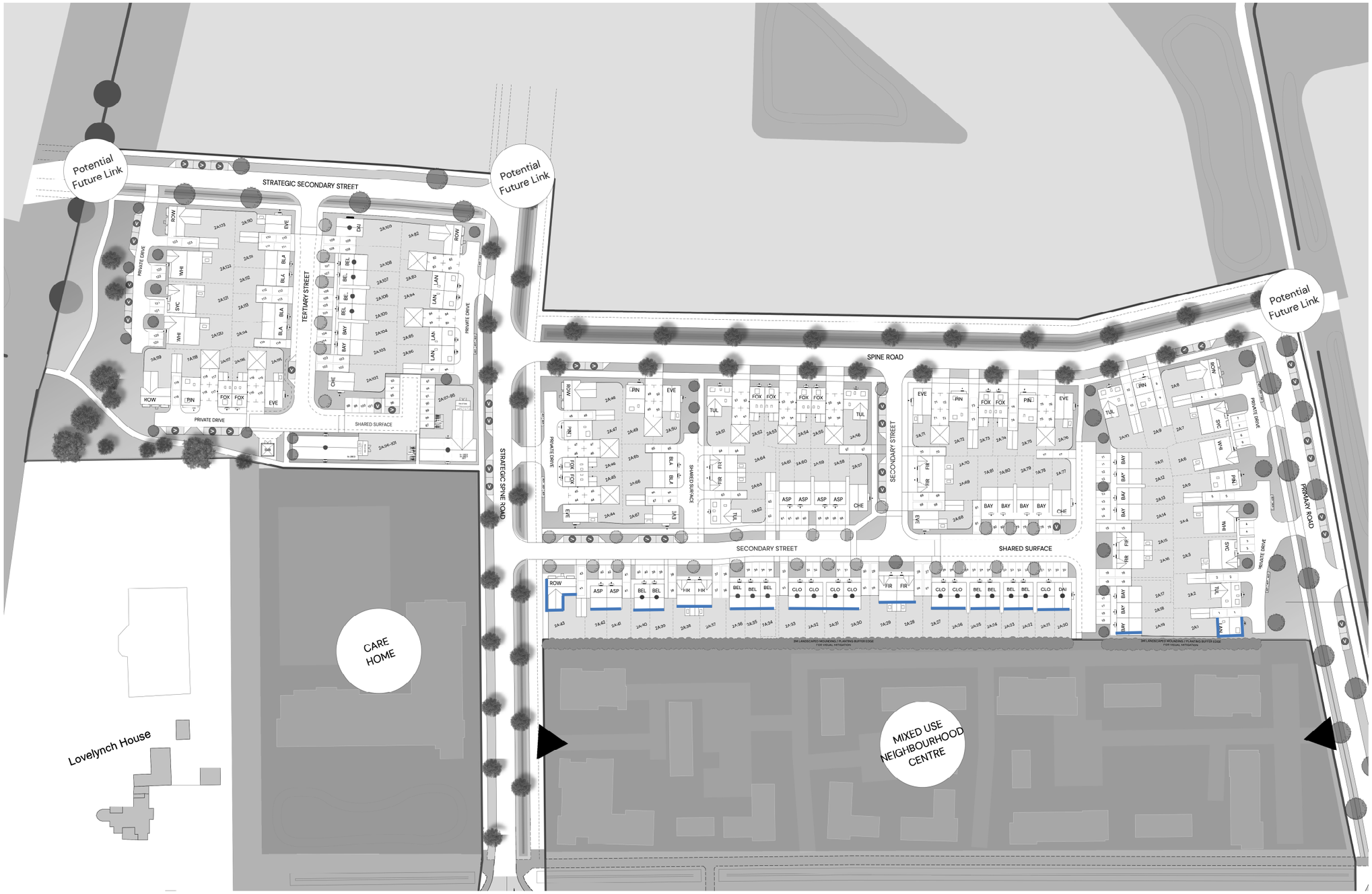
FIGURE 10

FACADE INSULATION REQUIREMENTS

HYDROCK PROJECT NO.	SCALE
27141	N/A

PURPOSE OF ISSUE	STATUS
FOR INFORMATION	S2

DRAWING NO.	
27141-HYD-XX-XX-DR-Y-1001	P01



KEY PLAN

ADO REQUIREMENT TO KEEP WINDOWS CLOSED

NOTES

WINDOWS OF MARKED FACADES WILL NEED TO REMAIN CLOSED TO ACHIEVE THE INTERNAL AMBIENT NOISE CRITERIA IN APPROVED DOCUMENT O DURING THE NIGHT-TIME.

WINDOWS SHOULD REMAIN OPEABLE FOR PURGE VENTILATION, WHEN REQUIRED.

DO NOT USE FOR TENDERING PURPOSES.

REVISIONS

P01	FIRST ISSUE EXAMPLE					
	J SCHOFIELD	01/06/23	E. GOLDSMITH	01/06/23		
REV.	REVISION NOTES/COMMENTS					

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CLIENT
CALA HOMES (COTSWOLD) LTD

PROJECT
HIMLEY VILLAGE

TITLE
FIGURE 11

ADO REQUIREMENTS TO KEEP WINDOWS CLOSED

HYDROCK PROJECT NO.	SCALE
27141	N/A

PURPOSE OF ISSUE	STATUS
FOR INFORMATION	S2

DRAWING NO.
27141-HYD-XX-XX-DR-Y-1002 P01

Appendix A Glossary of Acoustic Terminology

Term	Description
dB (decibel)	The scale on which sound pressure level is expressed. Sound pressure level is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10-5Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' - weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$L_{Aeq,T}$	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L_{10} and L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time, and the L_{90} is the level exceeded for 90% of the time.
R_w	Rw is the single-number quantity which characterizes the sound insulating properties of a given material over a range of frequencies. This is typically measured in a laboratory in accordance with BS EN ISO 717-1.
$D_{n,e,w}$	$D_{n,e}$,w is the single number quantity which characterizes the airborne sound insulation performance across a given 'element' and is typically used to describe the acoustic performance of trickle ventilators etc.
C_{tr}	C_{tr} is a correction term applied to single-number sound insulation values (Rw, $D_{n,e,w}$ etc.) to afford additional weighting against low frequency performance.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, it is measured outside and at least 3m from buildings.

Appendix B Policy, Standards & Guidance

National Planning Policy Framework (NPPF)

Published in 2021, this document sets out the Government's planning policies for England and supersedes the previous version of the NPPF published in 2019. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

> *"174. Planning policies and decisions should contribute to and enhance the natural and local environment by*
>
> *[...]*
>
> *e) Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."*

It also makes the following references to noise in the Section entitled Ground conditions and pollution:

> *"185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *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(60);*
>
> *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*
>
> *60 See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."*

And

> *"187. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."*

Noise Policy Statement for England (NPSE)

Published in March 2010, the Noise Policy Statement for England (NPSE) sets out the long-term vision of Government noise policy as follows:

"Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development."

The NPSE identifies three observed effect levels, names "No Observed Effect Level" (NOEL), "Lowest Observed Adverse Effect Level" (LOAEL) and "Significant Observed Adverse Effect Level" (SOAEL).

The NPSE contains little detail on assessment methodologies and specific parameters at which the varying observed effect levels would occur in the context of a residential development.

BS 8233:2014 - Guidance on sound insulation and noise reduction for buildings

As discussed above, there is no specific guidance contained within the Planning Condition and the NPSE. In lieu of this, the approach that is generally adopted when assessing environmental noise sources on residential developments is to undertake an assessment in accordance with BS 8233: 2014.

BS 8233 provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building. The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings for steady external noise sources. It is stated that it is desirable that the internal ambient noise level does not exceed the following criteria set out in the table below:

Activity	Location	Period	
		Daytime (07:00 to 23:00 hrs)	Night-time (23:00 to 07:00 hrs)
Resting	Living room	$L_{Aeq,16hrs}$ 35 dB	-
Dining	Dining room/area	$L_{Aeq,16hrs}$ 40 dB	-
Sleeping (daytime resting)	Bedroom	$L_{Aeq,16hrs}$ 35 dB	$L_{Aeq,8hrs}$ 30 dB

Whilst BS 8233:2014 recognises that a guideline value may be set in terms of SEL or L_{AFmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: Guidelines for Community Noise below.

With respect to external amenity space such as gardens and patios it is stated that it is desirable that the noise level does not exceed 50 dB $L_{Aeq,T,}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

World Health Organisation (WHO) 1999: Guidelines for Community Noise

As with the 'good' and 'reasonable' criteria in BS 8233, the L_{AFmax} criterion in BS8233 is largely concordant with the World Health Organisation (WHO) guidance 1999: Guidelines for community noise. This document draws upon guidance from Vallet and Vernay, which states:

"For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night"

BS 4142:2014 - Methods for rating and assessing commercial and industrial sound

BS 4142 describes methods for rating and assessing sound from industrial and manufacturing processes, fixed installations which comprise mechanical and electrical plant and equipment, the loading and unloading of goods and materials at industrial and/or commercial premises and mobile plant and vehicles that are an intrinsic part of the overall sound emanating from premises or processes.

The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

If appropriate, the specific sound level of the source (LAeq,T) is corrected, by the application of one or more corrections for acoustic features to give a 'rating' level (LAr,Tr). The Standard effectively compares and rates the difference between the rating level of the sound and the prevailing background sound level (LA90,T). Comparing the rating level with the background sound level, BS 4142 states:

"Typically, the greater this difference, the greater the magnitude of impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

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

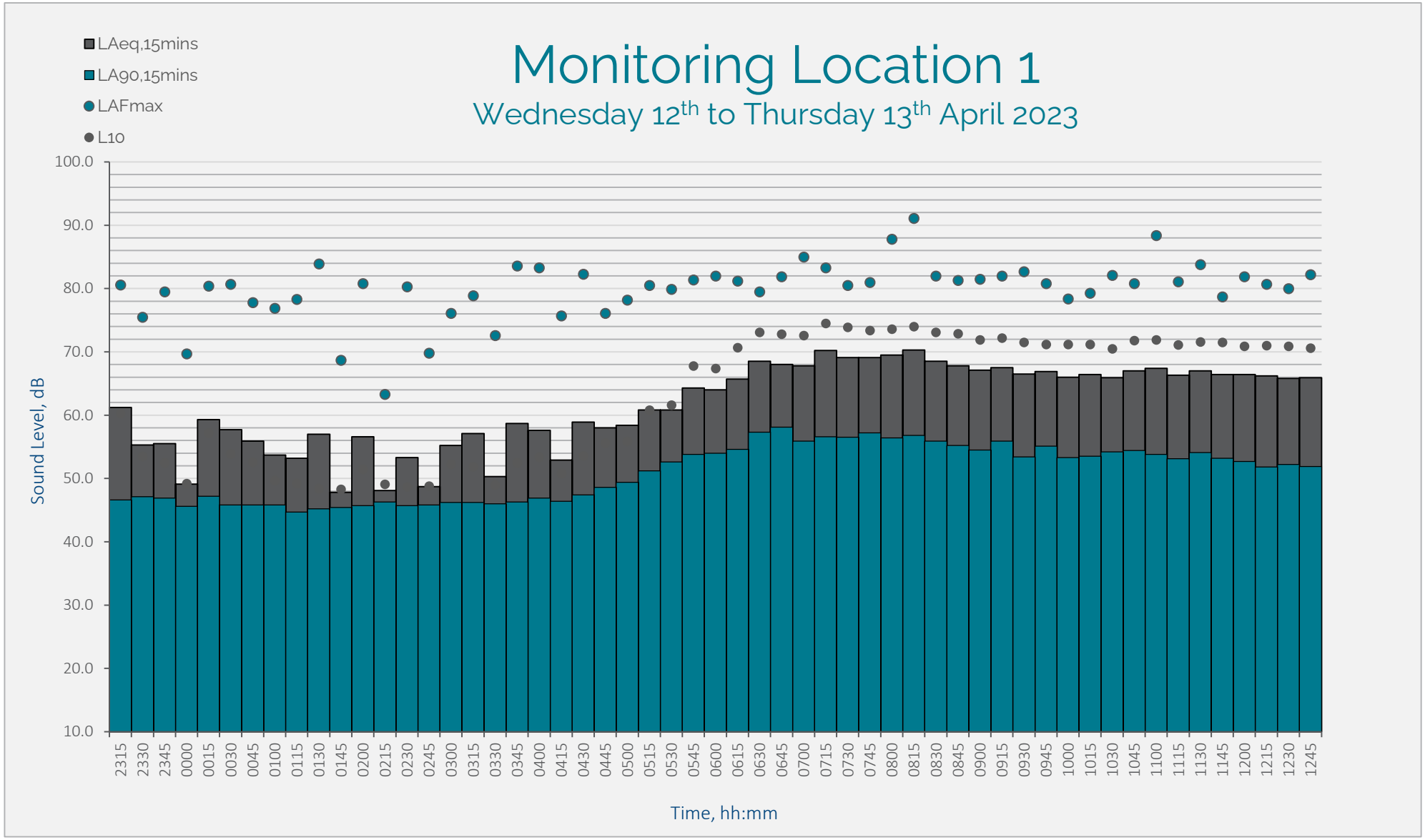
The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound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

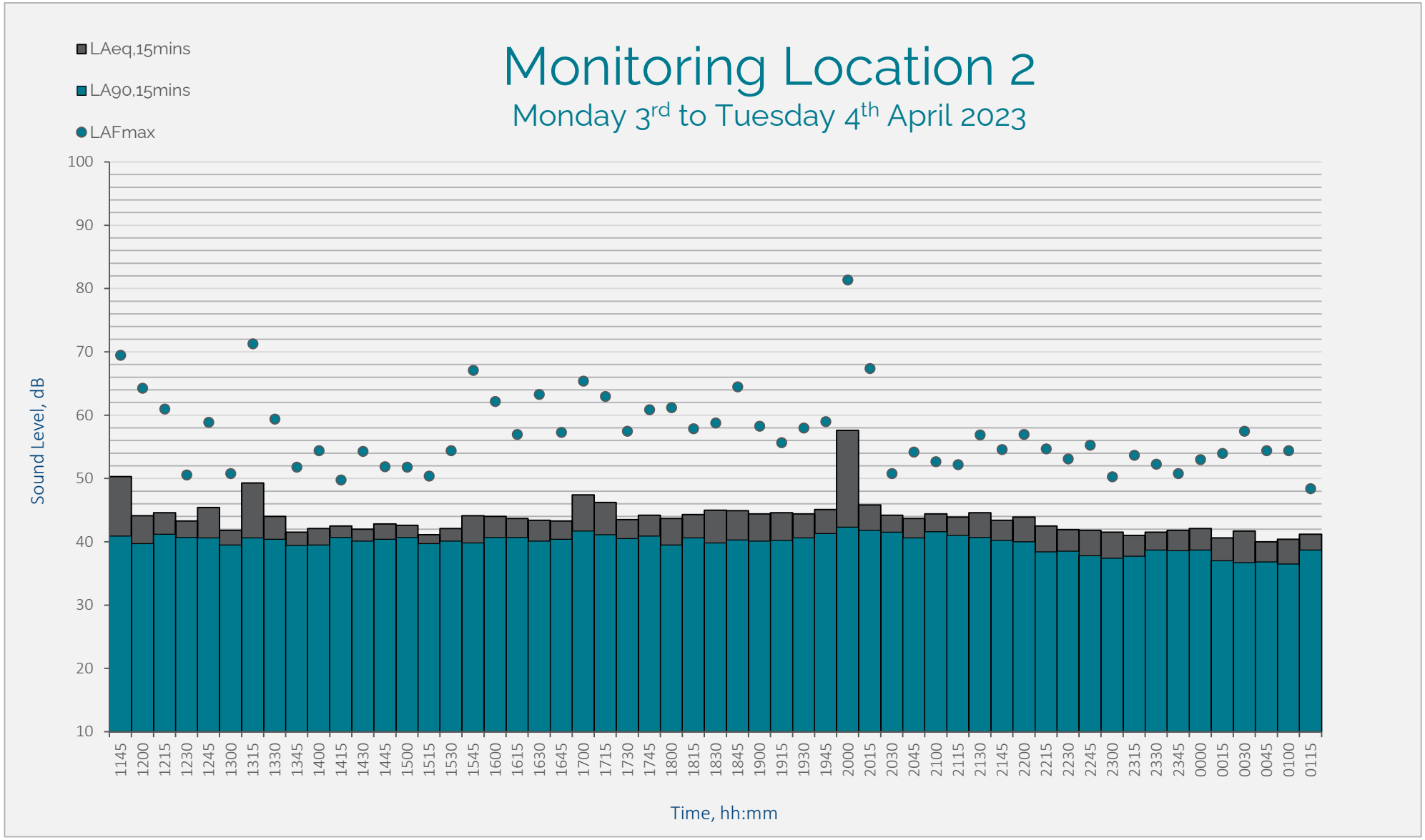
Appendix C Assumptions

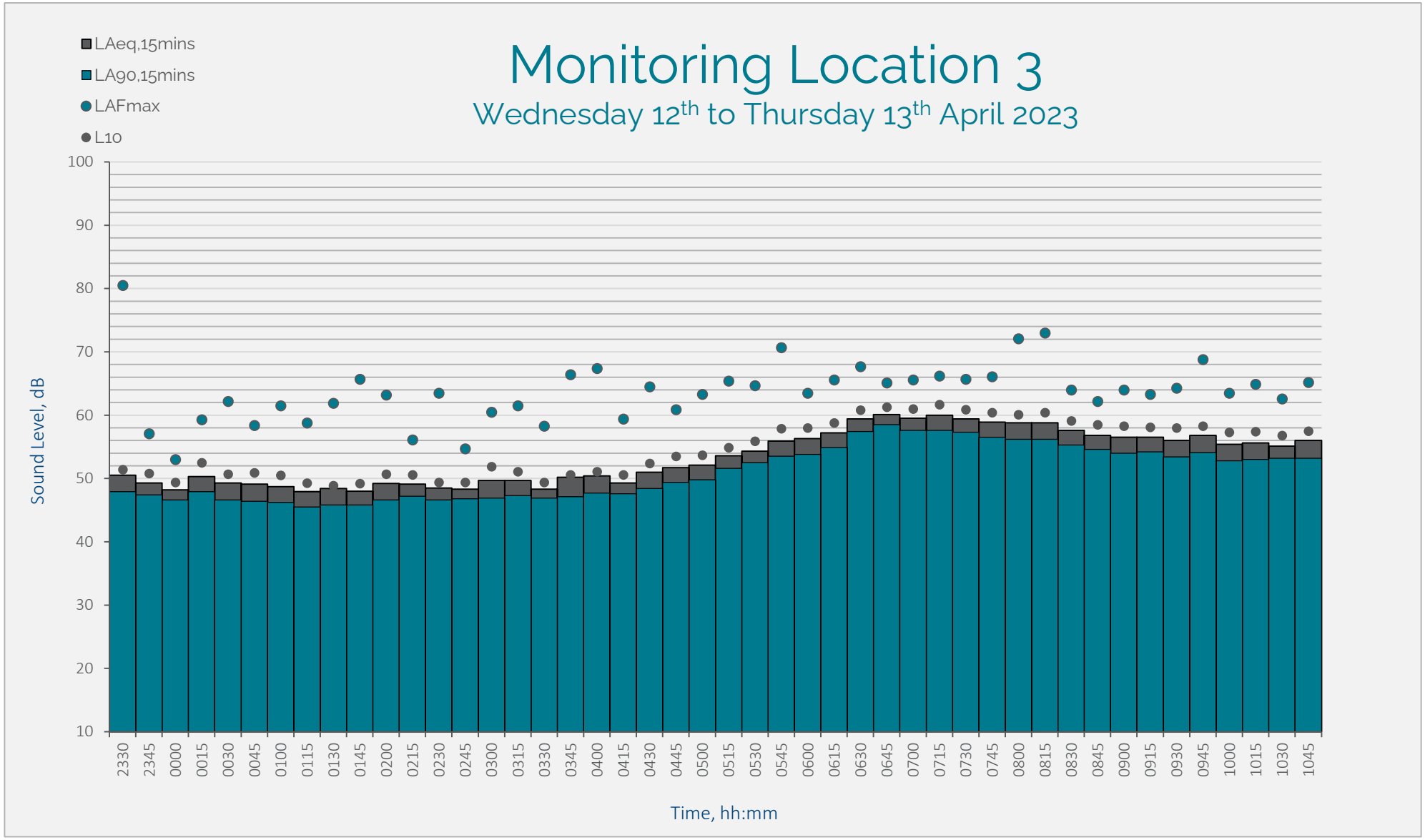
Assumptions:

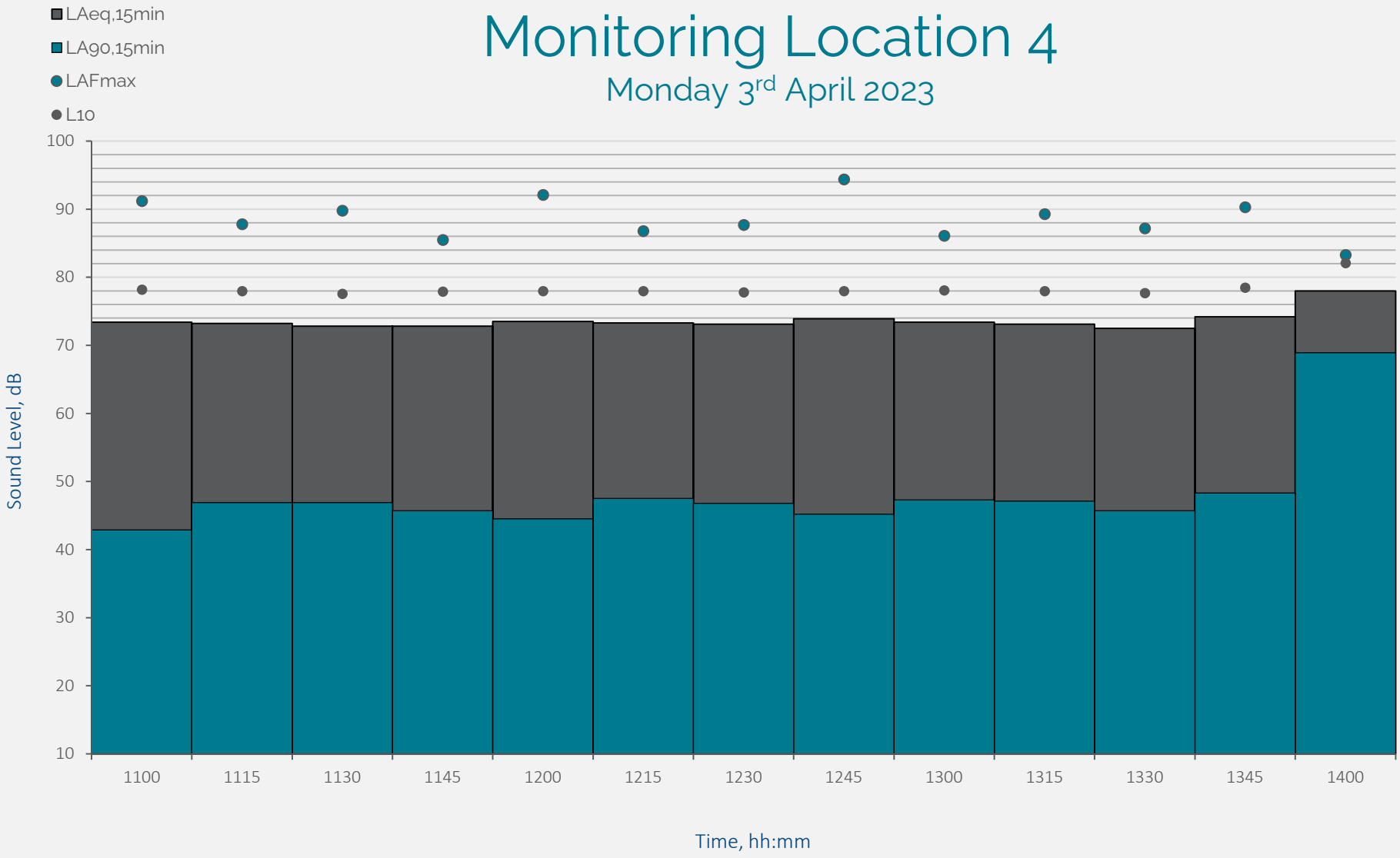
- Mapping of the Site and the surrounding area was calibrated in the noise model based on known Ordinance Survey grid reference points;
- A digital terrain model was created using OS Terrain data with a resolution of 5m;
- The model allows for second order reflections;
- Ground absorption was set to G = 0.5 for mixed ground (50% acoustically absorptive ground);
- Source emissions of the roads and vehicle movements and loading events are set at 0.5m high;
- The on-time and events of the sources are considered to be reasonably accurate;
- The background noise measurements were selected to be sufficiently representative and suitable to support the assessment.

Appendix D Measured Noise Levels


Monitoring Location 1
Wednesday 12th to Thursday 13th April 2023
LAeq,15mins
LA90,15mins
LAFmax
L10
Sound Level, dB
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
2315
2330
2345
0000
0015
0030
0045
0100
0115
0130
0145
0200
0215
0230
0245
0300
0315
0330
0345
0400
0415
0430
0445
0500
0515
0530
0545
0600
0615
0630
0645
0700
0715
0730
0745
0800
0815
0830
0845
0900
0915
0930
0945
1000
1015
1030
1045
1100
1115
1130
1145
1200
1215
1230
1245
Time, hh:mm


LAeq,15mins
LA90,15mins
LAFmax
Monitoring Location 2
Monday 3rd to Tuesday 4th April 2023
Sound Level, dB
100
90
80
70
60
50
40
30
20
10
1145
1200
1215
1230
1245
1300
1315
1330
1345
1400
1415
1430
1445
1500
1515
1530
1545
1600
1615
1630
1645
1700
1715
1730
1745
1800
1815
1830
1845
1900
1915
1930
1945
2000
2015
2030
2045
2100
2115
2130
2145
2200
2215
2230
2245
2300
2315
2330
2345
0000
0015
0030
0045
0100
0115
Time, hh:mm


Monitoring Location 3
Wednesday 12th to Thursday 13th April 2023
LAeq,15mins
LA90,15mins
LAFmax
L10
Sound Level, dB
100
90
80
70
60
50
40
30
20
10
2330
2345
0000
0015
0030
0045
0100
0115
0130
0145
0200
0215
0230
0245
0300
0315
0330
0345
0400
0415
0430
0445
0500
0515
0530
0545
0600
0615
0630
0645
0700
0715
0730
0745
0800
0815
0830
0845
0900
0915
0930
0945
1000
1015
1030
1045
Time, hh:mm


Monitoring Location 4
Monday 3rd April 2023
LAeq,15min
LA90,15min
LAFmax
L10
Sound Level, dB
100
90
80
70
60
50
40
30
20
10
1100
1115
1130
1145
1200
1215
1230
1245
1300
1315
1330
1345
1400
Time, hh:mm

Appendix E Schedule of Commercial & Industrial Use & Operations

Schedule of Commercial & Industrial Use & Operations

Units the east of the site are permitted to operate under B2, B8 and E(g) planning class use. A summary of the units has been provided below together with information on associated sound sources.

Unit 1 – Name Unknown

No significant noise was observed from this premises. The unit appeared to be vacant however some cars were located within the car parking area. Six loading bays were located to the rear of the building with waste in its external service area, however no deliveries were observed throughout the duration of the survey. No externally located plant was identified with this unit. This unit is believed to be used for storage and office purposes. It's believed that this owner also occupies Unit 13.

Unit 2 & 3 – Origin Doors & Windows

Premises understood to distribute doors and windows. Some noise was observed from this premises. Seven loading bays were identified with no externally located plant. The company informed that they would take approximately 2-3 deliveries per week during the daytime period only i.e. between 0700 and 1700hrs.

Unit 4 & 5 – Vacant

Unit 6 – React Industrial Solutions

Mechanics. One loading bay through the main entrance. No significant noise observed during the survey. Premises informed they would open at 0800hrs and close by 1700hrs. Up to 7 deliveries could occur at this premises during an hour period. However, these deliveries are expected to be from smaller 3.5t vehicles and not HGVs.

Unit 7 & 8 – Vacant

These units appeared to be vacant however whilst on site Hydrock were informed these premises were occupied by H2H (see Unit 11). Unit 7 and 8 had one loading bay each. It's understood this business operates only during the daytime period.

Unit 9 & 10 – Pursuit Racing

Car testing and storage facility. No significant noise observed throughout the period of the survey. Business owner informed that they might take one delivery per week (i.e. infrequent and not significant), when a car would go out to an owner, or when a car would be returned. Repair and other mechanical works occur at the premises. These tests would occur intermittently within the unit prior to a vehicle being shipped. This premises is understood to operate only during the daytime period i.e. 0700-1700hrs.

Noise from this unit may need to be considered in more detail at the latter phases of the wider development but isn't considered significant for Phase 2A parcel.

Unit 11 – House 2 Home Removals

Storage facility. No observed noise or operations throughout the duration of the survey. This premises is understood only to operate during the daytime period i.e. 0700-1700hrs. This unit also has one loading bay.

Unit 12 – Fabal

Aluminium manufacturing and distribution company. Unit appeared vacant on site. Research online showed that this unit is the distribution centre for the company. This premises is understood only to operate during the daytime period i.e. 0700-1700hrs. This unit also has one loading bay.

Unit 13 – Name Unknown

Unit appeared vacant with no observed noise from the building. From consultation with other companies on Site we believe this Unit is also owned by the same company occupying Unit 1. This unit has 16 loading bays.

Unit 14 – The Menu

Food preparation and distribution centre. Noise from this unit was most significant on the estate. The unit operates 24h Monday to Saturday, closing approx. 1900-2000hrs Saturday evening and re-opening Sunday morning at approximately 0600hrs. In total the unit has 11 loading bays.

Import

The premises can receive up to 40 deliveries between 0600 and 1600hrs, which can be up to 44t. On average, therefore the unit can receive 4 delivers in a one-hour period.

Export

The premises also has up to 12 (18t) HGVs and 22 vans leave the premises between 0400hrs and 0600hrs.

These vehicles return intermittently throughout the daytime period up to 1800hrs.

HGVs that return are loaded on the delivery bays and wait on the eastern boundary of the premises' service area with the internal chiller running to keep produce cold. These HGVs then make another delivery between 1930 and 2000hrs.

Vans that return from the first trip and not loaded and sent on another trip. These vehicles are loaded between approximately 2200 and 0400hrs and wait on the eastern boundary with the chiller running prior to leaving again at approx. 0400-0600hrs.

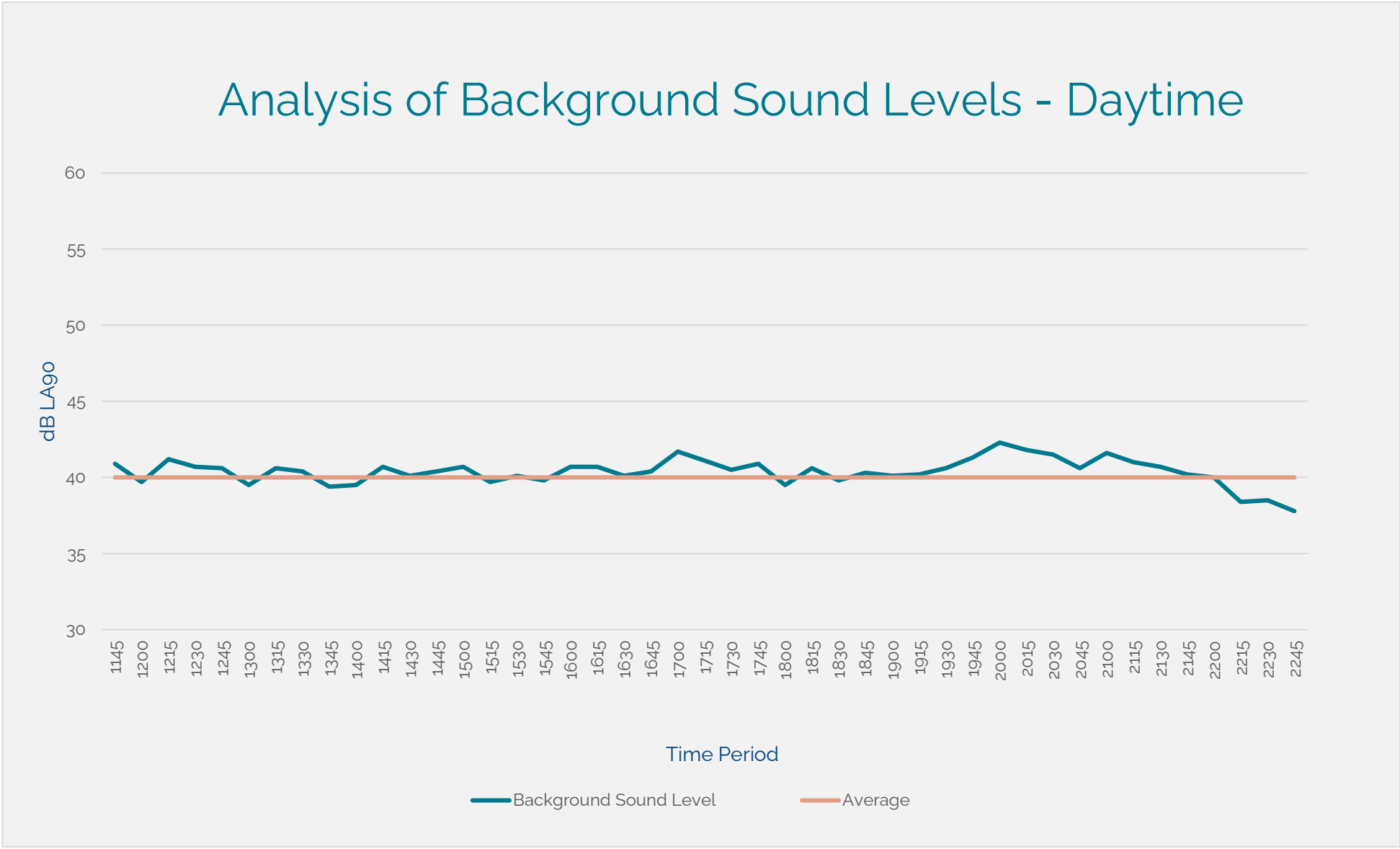
HGVs that return from the second trip are then re-loaded and wait again on the eastern boundary with the chiller running, prior to leaving again at approx. 0400-0600hrs.

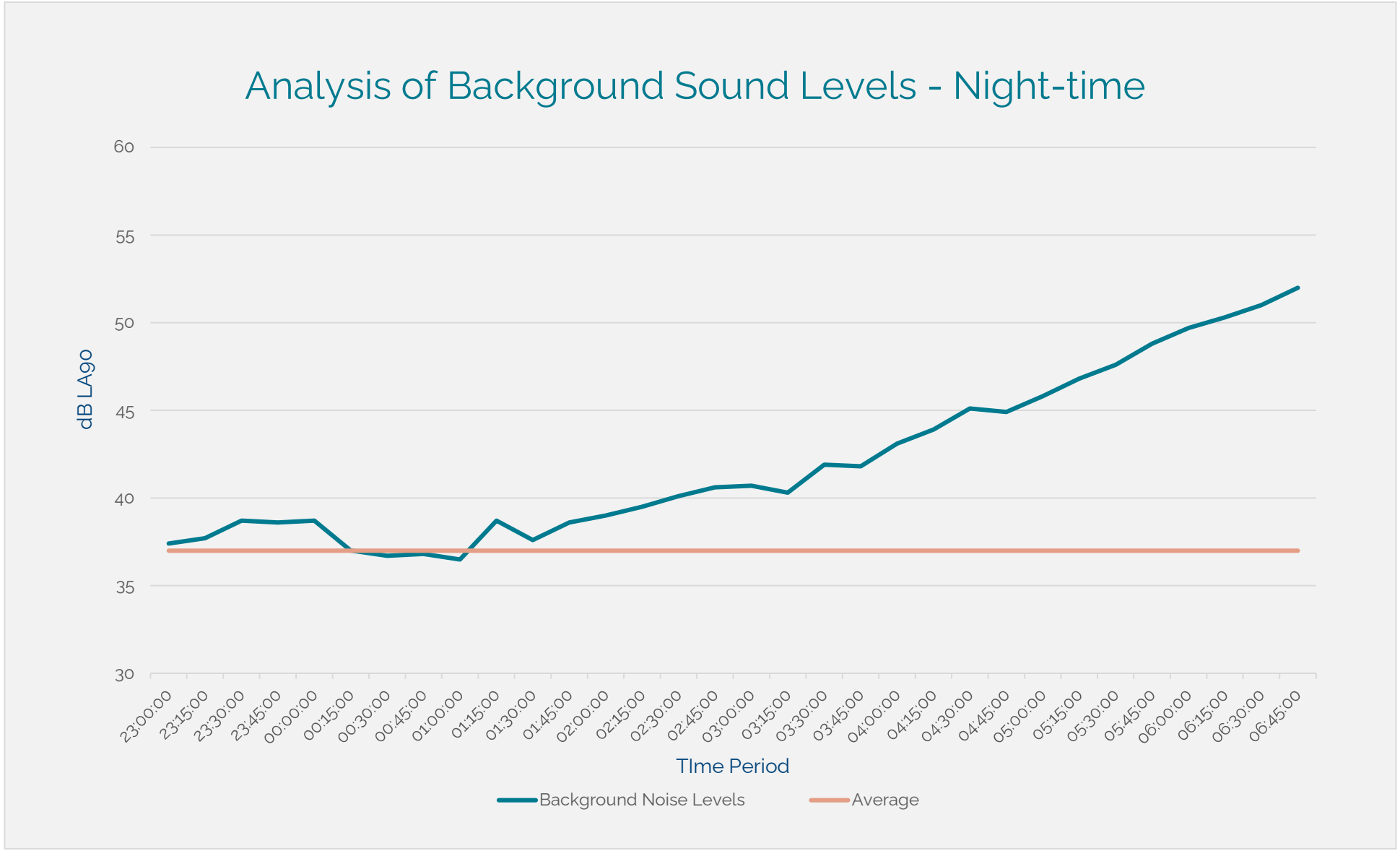
Other

All small vans and 18t vehicles are cleaned intermittently throughout the daytime period with a jet wash. They informed this is a frequent activity, and most vehicles need to be cleaned on a daily basis due to the nature of the business.

The premises also has externally located chillers (HVAC) located abut the southern faced of the building, comprising 10 condenser fans and associated compressor units.

Appendix F Analysis of Background Sound Levels


Analysis of Background Sound Levels - Daytime
dB LA90
60
55
50
45
40
35
30
1145
1200
1215
1230
1245
1300
1315
1330
1345
1400
1415
1430
1445
1500
1515
1530
1545
1600
1615
1630
1645
1700
1715
1730
1745
1800
1815
1830
1845
1900
1915
1930
1945
2000
2015
2030
2045
2100
2115
2130
2145
2200
2215
2230
2245
Time Period
Background Sound Level
Average

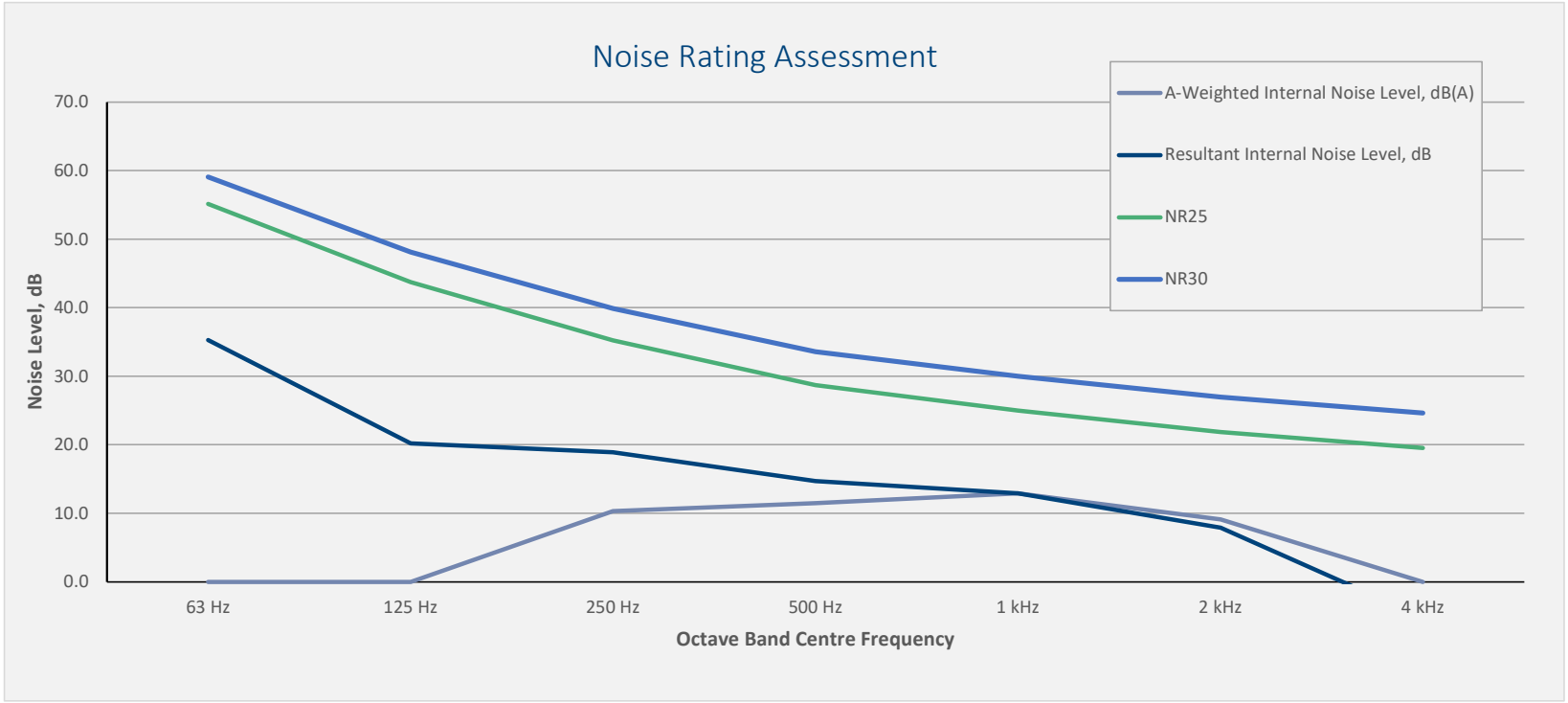

Analysis of Background Sound Levels - Night-time
60
55
50
45
40
35
30
dB LA90
23:00:00
23:15:00
23:30:00
23:45:00
00:00:00
00:15:00
00:30:00
00:45:00
01:00:00
01:15:00
01:30:00
01:45:00
02:00:00
02:15:00
02:30:00
02:45:00
03:00:00
03:15:00
03:30:00
03:45:00
04:00:00
04:15:00
04:30:00
04:45:00
05:00:00
05:15:00
05:30:00
05:45:00
06:00:00
06:15:00
06:30:00
06:45:00
TIme Period
Background Noise Levels
Average

Appendix G Noise Rating Curve Assessment

Noise Rating Curve Assessment

Assessment of Industrial Noise in Habitable Rooms with an Open Window

Frequency, Hz	Resultant Internal Noise Level, dB	NR25	NR30	NR40	A weighting	A-Weighted Internal Noise Level, dB(A)
63 Hz	35.3	55.2	59.1	67.0	-26.2	0.0
125 Hz	20.2	43.8	48.1	56.8	-16.1	0.0
250 Hz	18.9	35.3	39.9	49.2	-8.6	10.3
500 Hz	14.7	28.7	33.6	43.4	-3.2	11.5
1 kHz	12.9	25.0	30.0	40.0	0.0	12.9
2 kHz	7.9	21.9	27.0	37.1	1.2	9.1
4 kHz	-5.2	19.5	24.7	34.9	1.0	0.0
				Overall Internal Noise Level, $L_{Aeq,T}$		17.4



Noise Rating Curve Assessment

Assessment of Industrial Noise in Habitable Rooms with 10/(6-16)/4 Glazing and Alternative Ventilation

Frequency, Hz	Resultant Internal Noise Level, dB	NR25	NR30	NR40	A weighting	A-Weighted Internal Noise Level, dB(A)
63 Hz	17.2	55.2	59.1	67.0	-26.2	0.0
125 Hz	22.2	43.8	48.1	56.8	-16.1	0.0
250 Hz	7.1	35.3	39.9	49.2	-8.6	-1.5
500 Hz	4.8	28.7	33.6	43.4	-3.2	1.6
1 kHz	-10.5	25.0	30.0	40.0	0.0	-10.5
2 kHz	-13.7	21.9	27.0	37.1	1.2	-12.5
4 kHz	-21.5	19.5	24.7	34.9	1.0	0.0
Overall Internal Noise Level, $L_{Aeq,T}$						7.2