

Project name	Himley Village		
Design note title	Reserved Matters - Conditions 14 & 15		
Document reference	16153		
Author	Leah Farrar		
Revision	1		
Date	30 April 2021	Approved	✓

1. INTRODUCTION

Hydrock has been appointed to provide acoustic engineering services to support the reserved matters application for Himley Village, Bicester.

The following noise-related planning conditions have been attached to the planning permission for the development:

14. Each reserved matters application for a phase 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.

Condition 14 requires the production of a mitigation strategy to protect residential uses against road traffic noise. An environmental noise survey was carried out by Hyder Consulting in 2010, however a new noise survey was required due to the elapsed time. The environmental noise survey was carried out on site 13th and 14th of April 2021.

With regards to condition 15, the energy centre is not located in this parcel. It is understood that an alternative strategy will be employed in this area, and therefore condition 15 does not require consideration during reserved matters for this parcel.

Consultation has been undertaken with Cherwell District Council to agree a suitable methodology to address planning condition 14, it was noted that it will be discharged at a later date due to current lockdown restrictions. This survey to address planning conditions has now been carried out due to the easing of lockdown restrictions.

This note details the proposed methodologies and conclusions for:

- Environmental noise surveying;
- Noise modelling;
- Control of noise to external amenity areas; and
- Control of noise to habitable rooms.

2. SITE DESCRIPTION & PROPOSED DEVELOPMENT

At present, the site consists of open land. The development site is located near Bicester, in a rural area. To the north of the site is open farmland with a railway line beyond. To the east is Howes Lane, with residential dwellings beyond. To the south the site is the B4030, with open land beyond. To the west is open land with the M40 beyond.

The proposed development parcel comprises 500 dwellings with associated gardens and parking. Vehicular access will be via the B4030.

The red line boundary is shown in the context of the site and surroundings on the attached **Figure 1**.

3. CONSULTATION WITH CHERWELL DISTRICT COUNCIL (CDC)

The proposed noise survey and assessment methodology was sent to Cherwell District Council; however, no response has been received at the time of writing. This assessment is based on our experience with similar sites.

The assessment considers the following potential impacts:

- The effect of existing road traffic noise, together with any existing commercial noise sources at proposed sensitive receptors; and,
- The effect of any proposed ancillary equipment at existing sensitive receptors.

4. NOISE SURVEY

4.1 Survey Overview

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).

All noise monitoring took place during conducive conditions, with wind speeds less than 5ms^{-1} and no significant precipitation.

4.2 Survey Procedure

Unattended noise monitoring was undertaken at two Monitoring Locations (MLs) considered to be representative of local noise climate. Attended monitoring was undertaken at a third ML off-site, in the vicinity of the nearby road network.

Monitoring Locations are summarised as follows:

- **ML1** - 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, together with the remainder of the local road network. Measurements were carried out over a 24hour period.
- **ML2** - Unattended monitoring was undertaken adjacent to the southern boundary of the site, approximately 9m from the B4030. This location is representative of road traffic noise generated by the B4030. Measurements were carried out over a 24hour period.
- **ML3** - Attended monitoring was undertaken to the east of the site, adjacent to Howes Lane. This location is representative of the road traffic noise generated by 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).

Noise monitoring locations are shown on the attached **Figure 1**.

4.3 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 dominant source on the site, at ML1 and ML3, during both the daytime and the night-time periods. Howes Lane (A4095) and B4030 contribute to the majority of the existing noise climate at the site. At ML3 regular HGV movements were observed during the daytime associated with nearby residential construction site.

Air Traffic: At ML1 and ML2 aircraft moment is audible from the nearby RAF bases. Occasionally, low flying aircrafts dominate the noise climate within this area.

Other Sources: Bird song and wildlife noise were regularly audible and occasionally dominant across the site during the daytime and night time period.

4.4 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.

Measured daytime and night time levels captured the full 24-hour period at ML1 and ML2 and therefore no adjustments were made to obtain the $L_{Aeq, 16hour}$ Or $L_{Aeq, 8hour}$.

Noise levels measured at ML3 captured road traffic noise at source (Howes Lane) in accordance with CRTN. This attended measurement captured 3 consecutive hours of road traffic to allow conversion to $L_{Aeq, 16hour}$ daytime and $L_{Aeq, 8hour}$ night-time.

A summary of measured noise levels is provided in Table 1.

Table 1: Average measured noise levels

Monitoring Location	Time Period	Measured Ambient Noise Level, $L_{Aeq,T}$ dB	Measured Background Noise Level, $L_{A90,T}$ dB
ML1	07:00 - 23:00	46	42
	23:00 - 07:00	47	42
ML2	07:00 - 23:00	69	45
	23:00 - 07:00	62	40
ML3	07:00 - 23:00	70*	-
	23:00 - 07:00	62*	-

*Denotes average daytime and night time noise levels derived from the shortened CRTN measurement.

The typical measured night-time L_{AFmax} noise levels measured during the survey are summarised in Table 2. Measured night time maxima which are not considered representative of the typical noise environment have been eliminated from this assessment.

Table 2: Summary of typical maximum night-time noise levels

Monitoring Location	Typical Night-time L_{AFmax} dB
ML1	64
ML2	81

5. NOISE ASSESSMENT

5.1 Overview

At this stage, detailed layouts of the proposed development are not known. For the purposes of this assessment, it has been assumed that the glazing to noise sensitive rooms would typically comprise 25% of the façade area. The overall attenuation provided by this percentage of glazing in a brick or block façade, has been considered.

5.2 Noise Modelling

In order to predict noise levels across the Site, an acoustic model has been generated using SoundPlan modelling software.

The model allows the significant sound sources in the vicinity of the Site to be calibrated according to the noise levels measured on-site; in this case the M40, B4030 and Howes Lane have been included.

Acoustic noise modelling of the proposed site can be found within Appendix C, **Figures 5, 6 and 7**.

5.3 Noise Assessment

The noise assessment has been based on the Proposed Site Plans (dated 18.12.20), provided by Countryside Properties.

5.3.1 Noise Levels in Outdoor Living Areas

The Proposed Masterplan indicates multiple ground level gardens and shared open spaces. Table 3 shows the guideline outdoor daytime noise levels, in accordance with BS8233.

Table 3: Noise Levels at the Proposed Development within Garden Areas

Proposed Receptors	Guideline values for Outdoor Levels, $L_{Aeq, T}$ dB
Dwellings within the Development Parcel	50-55

Figure 5 shows that daytime noise levels in proposed outdoor living areas in adjacent to the southern boundary of the site, closest to and with direct line of sight to the B4030, exceed the upper guideline level of 55dB $L_{Aeq, T}$, therefore mitigation is required in accordance with BS8233.

However, across the remainder of the Site daytime average noise levels are below the upper guideline value of 55dB $L_{Aeq, T}$ recommended by BS8233. Therefore, no specific mitigation is required in these areas.

5.3.2 Daytime Noise Levels in Living Rooms and Bedrooms

The minimum composite sound reduction required of facades, in order to achieve appropriate internal daytime noise levels, in accordance with BS8233, is summarised in Table 4 below.

Table 4: Daytime Façade Noise Levels at the Proposed Development and Required Attenuation

Proposed Receptors	Daytime Façade Level, $L_{Aeq,T}$ dB	Minimum Composite Sound Reduction of Façade, D_w , dB
Proposed dwellings in the Northern part of the Site closest to Monitoring Location 1	49	14
Proposed dwellings in the southern part of the Site closest to Monitoring Location 2	60	25

Proposed habitable rooms facing in to the Site, away from B4030 will be screened from off-site noise sources by the buildings themselves. Therefore, the level of attenuation required at these facades will be less than that detailed in Table 4.

5.3.3 Night-time Noise Levels in Habitable Rooms

The level of façade noise attenuation required to achieve appropriate internal night-time noise levels, in accordance with BS8233, is summarised in Table 5 below.

Table 5: Night-time Façade Noise Levels at the Proposed Development and Required Attenuation

Proposed Receptors	Night-time Façade Level, $L_{Aeq,T}$ dB	Maximum Night-time Façade Noise Level, $L_{Aeq,T}$ dB	Required Composite Sound Reduction of Façades, D_w , dB
Proposed dwellings in the Northern part of the Site closest to Monitoring Location 1	40	60	15
Proposed dwellings in the southern part of the Site closest to Monitoring Location 2	53	70	25

Proposed habitable rooms facing in to the Site, away from B4030 will be screened from off-site noise sources by the buildings themselves. Therefore, the level of attenuation required at these facades will be less than that detailed in Table 5.

5.3.4 Noise from Proposed Fixed Plant

At this stage, detailed information relating to any proposed fixed plant and/or building services is unavailable, guideline noise limits have been formulated based on the existing noise environment, in accordance with current guidance.

With reference to BS4142, the atmospheric noise emissions limits have been determined for any proposed fixed building services plant (with the exception of emergency plant i.e. back-up generators).

Noise associated with the development shall be controlled to the guideline levels outlined in Table 6, where possible, when assessed in accordance with BS4142, at the nearest noise sensitive receptor. The limits correspond to the 5 dB below the average background noise levels measured at ML2.

Table 6: Guideline Atmospheric Plant Noise Emission Limits

Period	Atmospheric Plant Noise Emission Limit (dB, L _{Ar,t})
Daytime (07:00 to 23:00 hrs)	40
Night-time (23:00 to 07:00 hrs)	35

6. NOISE MITIGATION MEASURES

6.1 Outdoor Living Areas

Noise limits for outdoors living areas, such as gardens have been set out in Table 3. After carrying out some distance attenuation calculations, it is likely that the noise levels within the outdoor living spaces will exceed the limit set out in BS8233 on the southern border of the site only.

For the southern edge of the site that runs parallel to the B4030, mitigation is required. Barriers should be considered that are at least 1.8m in height with a surface density of 10kg/m².

Properties into the site and further away from the B4030 will be screened by intervening buildings, and the noise levels within these garden areas will achieve guideline levels recommended by BS8233 and therefore mitigation will not be required.

6.2 Living Rooms and Bedrooms

For the majority of the Site, open windows as a primary form of background ventilation would allow recommended internal noise levels to be achieved within living rooms and bedrooms. Therefore, no specific facade mitigation is required.

However, proposed living rooms and bedrooms in the southern part of the Site, closest to the B4030 will require the implementation of an alternative means of ventilation, to allow windows to remain closed, while retaining sufficient background ventilation and appropriate internal noise levels. However, it's recommended that openable windows should be included to facilitate purge ventilation (i.e. removal of fumes/odours).

At this stage of the project, detailed information has not yet been developed regarding façade construction, ventilation strategy etc. The preliminary acoustic specifications contained herein are therefore subject to development during technical design, and should not be used for tender purposes.

The preliminary ventilation guidance outlined below is based on the understanding that the preferred approach, would be to include trickle ventilators and constant Mechanical Extract Ventilation (MEV) (Building Regulations Approved Document F - System 3).

When carrying out internal noise level predictions, the following assumptions have been made:

- Windows are closed, but trickle ventilators are operational i.e. open;
- A reverberation time of 0.5 seconds in habitable rooms;
- Size of windows/percentage of glazed façade area based on drawings provided;
- External walls will provide a sound reduction performance that is at least 5 dB higher than the specified glazing; and
- A single trickle ventilator (circa 2,500 mm²) per habitable room, where trickle ventilators are feasible.

Preliminary sound reduction performances for glazing and ventilators to habitable rooms, and example configurations are outlined in Table 7.

Table 7: Preliminary acoustic specification for glazing and ventilators

Site Area	Preliminary minimum sound reduction performance (dB)		Example configuration
	Glazing ($R_w + C_{tr}$)	Ventilator ($D_{n,e,w} + C_{tr}$)	
Southern Part of the Site	34	38	<ul style="list-style-type: none"> • 6mm / 12mm / 4mm standard thermal double glazing; and • Acoustic trickle ventilator or mechanical ventilation (MVHR).

7. CONCLUSIONS & SUMMARY

Hydrock is appointed to provide acoustic engineering services to support the reserved planning matters application for Himley Village, Bicester.

Two noise-related planning conditions have been imposed upon the development.

Condition 14 requires the production of a mitigation strategy to protect residential uses against road traffic noise. An environmental noise survey was carried out by Hyder Consulting in 2010, however a new noise survey has been carried out due to the elapsed time.

With regards to condition 15, the energy centre is not located in this parcel. It is understood that an alternative strategy will be employed in this area, and therefore condition 15 does not require consideration during reserved matters for this parcel.

The proposed noise survey and assessment methodology was sent to Cherwell District Council; however, no response has been received at the time of writing.

A noise survey has been carried out in order to establish the existing noise environment at the proposed development site, during the daytime and night time periods, in accordance with current guidance. This survey took place as lockdown restrictions eased and allowed an representative baseline noise climate to be obtained.

Road traffic noise from Howes Lane (A4095) and B4030 together was found to be dominant throughout the daytime and night-time periods.

Calculations indicate that standard thermal double glazing and acoustic trickle ventilators or MVHR should provide sufficient attenuation of existing noise sources, during the daytime and night-time periods, to ensure that guideline internal noise levels are achieved within habitable rooms, in accordance with BS8233.

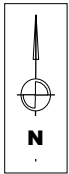
Atmospheric plant noise emission limits have been established based on the results of the noise survey. These are likely to be achieved with appropriate consideration for selection of low-noise plant and proprietary attenuation measures as appropriate during technical design.

This report demonstrates that appropriate living conditions in accordance with BS8233 and WHO guidance can be achieved within proposed external living areas and habitable rooms across the majority of the site without any specific mitigation.

However, dwellings in the southern part of the site, closest to and with direct line of sight to the B4030 will require relatively standard mitigation measures to achieve suitable living conditions. Close boarded fencing between proposed gardens and the B4030 are required, together with acoustic façade ventilation allowing windows to remain closed while maintaining sufficient background ventilation and internal noise levels.

Therefore, it is considered that there is no reason for refusal of planning permission, on acoustic grounds.

Appendix A Monitoring Locations



- Approximate Site Boundary
- Approximate Monitoring Locations



Project Title	Himley Village, Bicester
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Drawing Title	Site Location and Monitoring Locations (MLs)
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Job Number	16153	By	SE
Date	20.01.21	Checked	EG
Scale	NTS	Status	A1

Rev	Description	Date	By
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Drawing No.	Figure 1
Issue	01

Appendix B Noise Survey Results

Figure 2: Noise levels at monitoring location 1

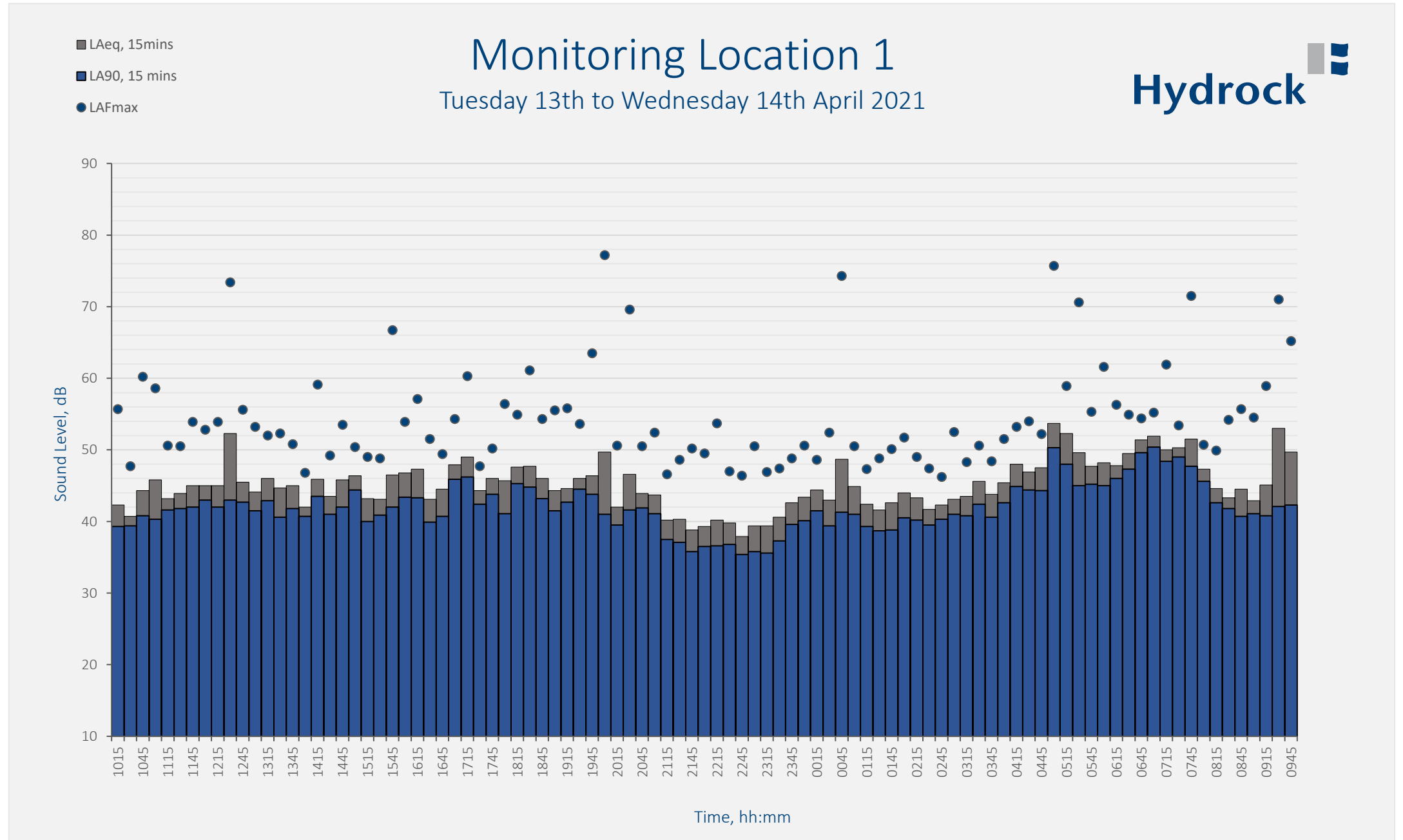


Figure 3: Noise levels at monitoring location 2

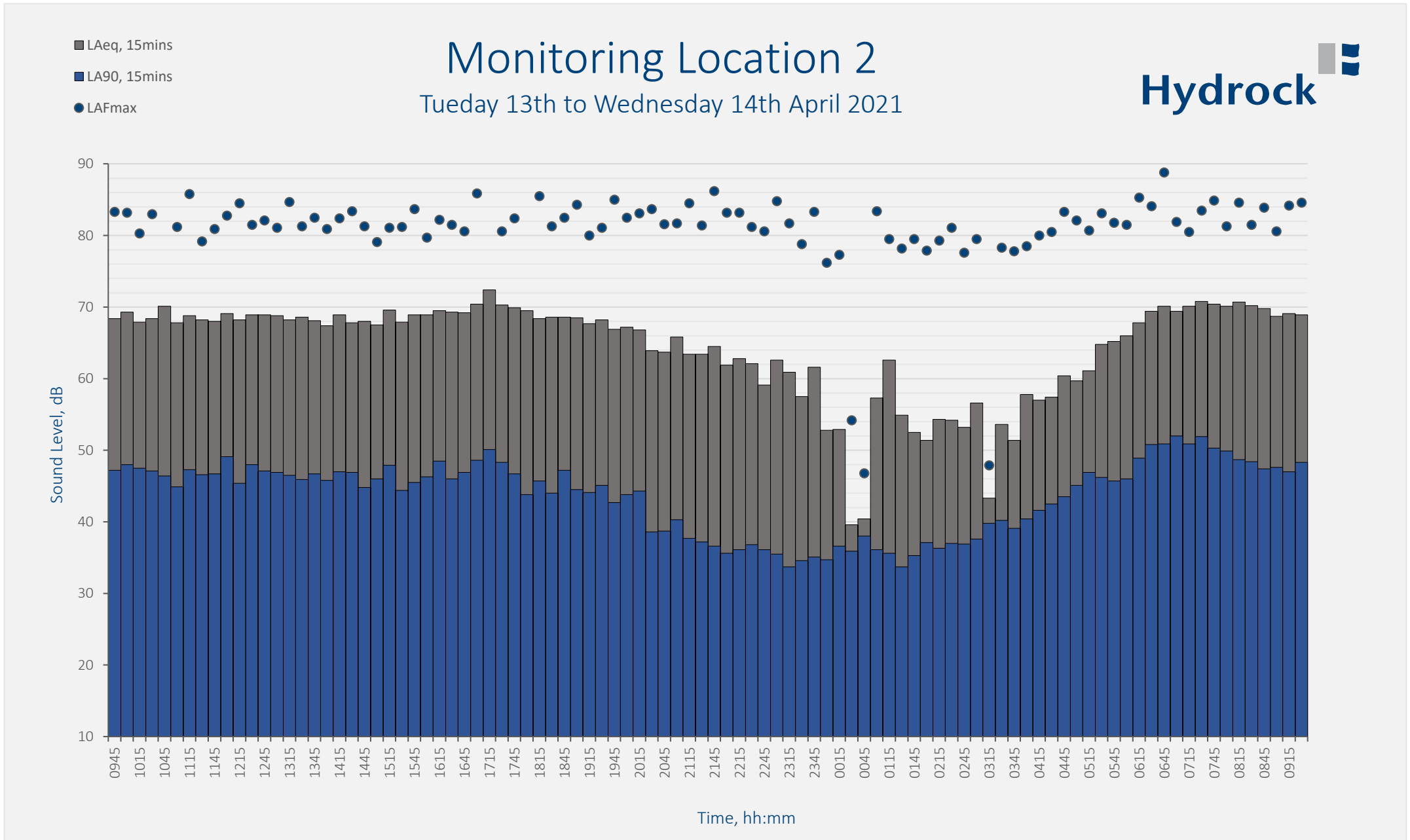
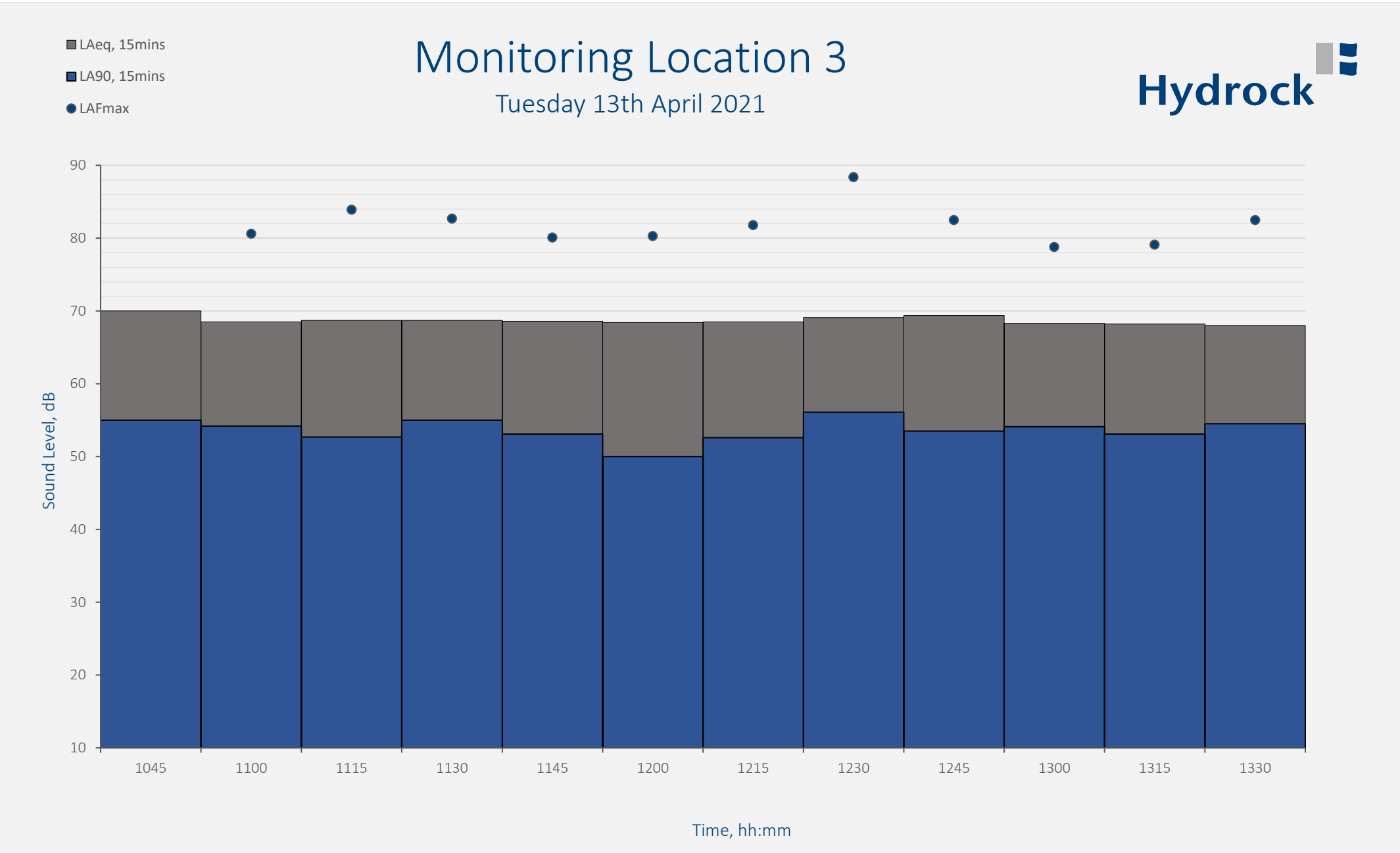





Figure 4: Noise levels at monitoring location 3











Appendix C Acoustic Noise Modelling



Legend

-  Existing Buildings
-  Road
-  Red Line Boundary

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

	\leq	50.0
	\leq	55.0
	\leq	60.0
	\leq	65.0
	\leq	70.0
	\leq	75.0
	\leq	80.0
	\leq	85.0

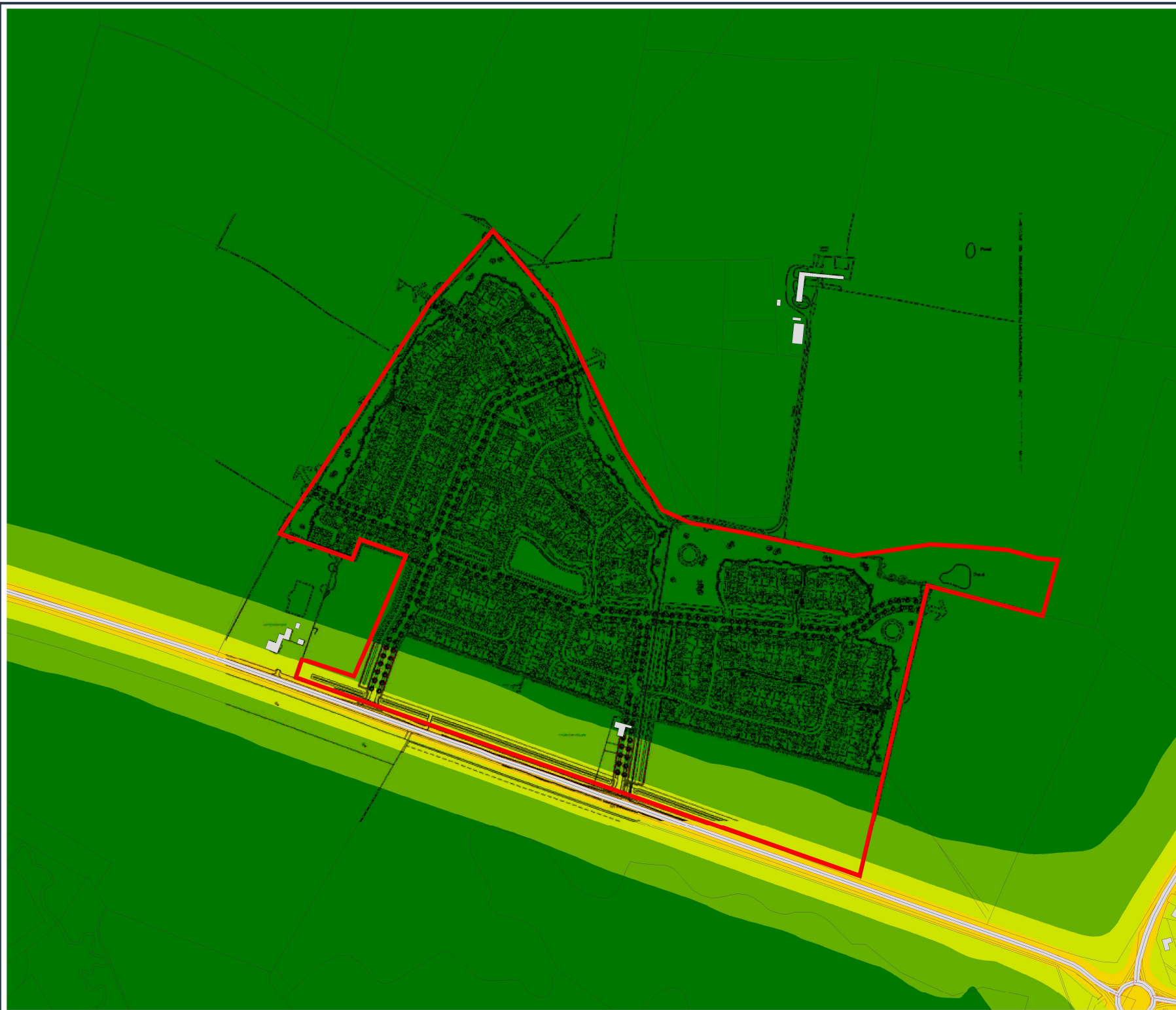
Client
Countryside Properties

Project
Himley Village

Title
Daytime Road Traffic
Noise Levels - $L_{Aeq,16hour}$

Figure FIGURE 5		Date 27/04/2021	
Revision REV 1	Scale 1:4000	Drawn LRF	Approved EG





Legend

- Existing Buildings
- Road
- Red Line Boundary

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

<=	50.0
50.0 <	55.0
55.0 <	60.0
60.0 <	65.0
65.0 <	70.0
70.0 <	75.0
75.0 <	80.0
80.0 <	

Client
Countryside Properties

Project
Himley Village




Title
Night-time Road Traffic
Noise Levels - $L_{Aeq,8hour}$

Figure FIGURE 6		Date 27/04/2021	
Revision REV 1	Scale 1:4000	Drawn LRF	Approved EG













Legend

-  Existing Buildings
-  Road
-  Red Line Boundary

Night-time $L_{Amax,15mins}$, dB

	\leq	50.0
	$50.0 <$	\leq 55.0
	$55.0 <$	\leq 60.0
	$60.0 <$	\leq 65.0
	$65.0 <$	\leq 70.0
	$70.0 <$	\leq 75.0
	$75.0 <$	\leq 80.0
	$80.0 <$	

Client
Countryside Properties

Project
Himley Village

Title
Maximum Night-time Road
Traffic Noise Levels -
 $L_{Amax,15mins}$

Figure FIGURE 7		Date 27/04/2021	
Revision REV 1	Scale 1:4000	Drawn LRF	Approved EG

