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Highmoor Lane, Cleckheaton

Noise Impact Assessment

For Thirteen Group

Date 19 May 2025

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1. Introduction

1.1 Overview

Hydrock have been appointed to provide acoustic engineering services in support of a planning application for a proposed residential development in Hartshead Moorside, Cleckheaton, BD19 6LW (hereafter the 'Site'). This report has been prepared in support of a full planning application for the development.

The assessment considers the potential noise and impacts associated with the construction and operational phases of the development on existing and proposed noise sensitive receptors, in accordance with the relevant Planning Policies and British Standards. The assessment findings and acoustic mitigation are set out herein.

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

1.2 Site Context

The Site is located to the west of Cleckheaton in Hartshead Moorside. To the west, the Site is bordered by the M62, between junctions 25 and 26, with Willow Valley Golf Course beyond. To the northeast, the Site is bordered by Halifax Road (A649), with existing residential dwellings and open land beyond. To the southeast, the Site is bordered by Highmoor Lane (A643), with existing residential properties and fields beyond. To the southwest, the Site is bordered by Hartshead Moor Cricket Club, with residential properties, open land, and Welcome Break Hartshead Moor services beyond.

The application is for the development of 40 residential dwellings, comprising 34 houses, as well as three connected two-storey apartment buildings encompassing six flats (hereafter the 'Proposed Development').

2. Methodology

A summary of the key noise considerations for the assessment are as follows:

- » Existing road traffic noise from vehicle movements on M62, Halifax Road (A649), Highmoor Lane and the remainder of the local road network at sensitive areas of the Proposed Development;
- » Existing entertainment noise from the cricket club at the Proposed Development
- » Existing commercial/industrial noise at the Proposed Development;
- » Fixed plant noise emissions associated with the Proposed Development. at existing and proposed noise sensitive receptors.

2.1 Consultation with Local Authority

The proposed survey and assessment methodology were sent to Kirklees Council's (KC) Environmental Health team on 12th June 2024, to which Mr. Mohammed Nasim, Senior Technical Officer of Environmental Health replied on the same day. Mr. Nasim agreed with the survey and assessment methodology in principle.

Mr. Nasim suggested that library data would be acceptable to use predicted noise from Hartshead Moor Cricket Club, if for any reason noise from a game was not able to be captured during the survey.

A noise survey was subsequently undertaken during a cricket match at Hartshead Moor Cricket Club in order to ensure representative baseline noise levels were established. Noise from the cricket match was not audible at the Site, so it is considered that noise impacts from Hartshead Moor Cricket Club are negligible and do not require any detailed predictions.

2.2 Policy, Standards and Guidance

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

- » National Planning Policy Framework, 2023;
- » Noise Policy Statement for England, 2010.
- » Planning Practice Guidance – Noise, 2019 (PPG);
- » World Health Organisation (WHO) 1999: Guidelines for Community Noise
- » British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233);
- » BS 4142:2014 + A1:2019 - Methods for rating and assessing commercial and industrial sound (BS4142); and,
- » Department for Transport – Calculation of Road Traffic Noise, 1988 (CRTN).

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

2.3 Existing Sensitive Receptors

This assessment considers the potential noise impact at four Existing Sensitive Receptors (ESRs). The receptors are identified in **Table 1** below and are illustrated on **Figure 1**. Other receptors may be considered however the impact is likely to be equal to or less than at the receptors identified.

Table 1: Receptors for Assessment

Existing Receptor	Address	Coordinates		Bearing from Site
		X (Easting)	Y (Northing)	
ESR1	916 Halifax Road, A649, Hartshead Moor, Kirklees, West Yorkshire, England, BD19 6LR, United Kingdom	417081	424707	North
ESR2	1 Brier Hill Cl, Hartshead Moor, Kirklees, West Yorkshire, England, BD19 6ND, United Kingdom	417181	424649	East
ESR3	10 Highmoor Lane, Hartshead Moor, Kirklees, West Yorkshire, England, BD19 6LW, United Kingdom	417150	424598	South-east
ESR4	19 Highmoor Lane, Hartshead Moor, Kirklees, West Yorkshire, England, BD19 6LW, United Kingdom	417144	424533	South-east

2.4 Noise Survey

A noise survey has been carried out to characterise the existing noise environment at and in the vicinity of the Site. A combination of site observations and a review of audio recordings at each Monitoring Location (ML) allow an analysis of the existing noise environment to be undertaken.

MLs are shown in **Figure 1** and full details of the survey are set out in **Section 3** of this report.

2.5 Acoustic Modelling

Environmental noise modelling has been carried out using SoundPLAN V9.1. The software uses OS mapping and terrain data to create a 3D study area of the Site. Calculations are carried out in accordance with ISO9613-2 and CRTN. Details of the Proposed Development and associated sound sources have been integrated into the model to predict noise levels at receptor locations

Noise modelling and assessment assumptions are summarised in **Appendix C**.

3. Noise Survey

3.1 Survey Overview

A noise survey was undertaken at the Site between the 19th and 21st June 2024.

Noise measurements were carried out using Class 1, integrating sound level meters. Microphones were positioned vertically on a tripod approximately 1.5m above the ground and at least 3.5m from any other reflecting surfaces, unless otherwise stated below.

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 drift in calibration was noted during the survey (<0.5 dB).

3.2 Weather Conditions

All noise monitoring took place during dry and calm conditions, with wind speeds less than 5ms⁻¹ and no precipitation. Met Office data from the closest station, in conjunction with observations made during setup and decommissioning of the noise monitoring equipment, is summarised as follows:

- » Temperatures ranging between 10°C and 20°C;
- » Varied cloud cover;
- » No precipitation;
- » Wind speed varying between 2 and 4ms⁻¹; and,
- » Dry ground

3.3 Monitoring Locations

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

Table 2: Noise Monitoring Locations

ML	Description	Approximate Measurement Period
ML1	Adjacent to the western boundary of the Site, approximately 34m from the carriageway of the M62. This location was selected to measure noise levels from road traffic on the M62.	1400hrs, 19/06/24 to 0900hrs, 21/06/24
ML2	Adjacent to the eastern boundary of the Site, approximately 11m from the roadside of Halifax Road A649. This location was selected to capture typical ambient noise in the eastern part of the Site associated with road traffic on Halifax Road and any nearby businesses, together with typical background noise levels representative of nearby ESRs.	1415hrs, 19/06/24 to 0945hrs, 21/06/24
ML3	Adjacent to the southeastern boundary of the Site, approximately 2m from the roadside of Highmoor Lane. This location was selected to capture road traffic noise levels from Highmoor Lane using the shortened CRTN method.	1000hrs, 19/06/24 to 1300hrs, 19/06/24

ML	Description	Approximate Measurement Period
ML4	Adjacent to the central western boundary of the Site which borders Hartshead Moor Cricket Club, approximately 7m from the Cricket Ground. This location was selected to capture a representative sample of ambient average and maximum noise levels from Hartshead Moor Cricket Club during a typical evening match, as well as representative background noise levels for nearby ESRs on Highmoor Lane.	1330hrs, 19/06/24 to 0930hrs, 21/06/24

3.4 Summary of Baseline Acoustic Environment

Observations made during the survey and a review of audio recordings identified the following noise sources contributing to the noise climate at the Site:

Road Traffic: Road traffic noise from the M62 and Halifax Road (A649) was dominant across the Site for the majority of the daytime and night-time periods. Road traffic noise from Highmoor Lane was occasionally audible at the south of the Site.

Commercial/Industrial Noise: No commercial/industrial noise was audible at the Site during the survey.

Cricket Club: A cricket match was played at Hartshead Moor Cricket Club on 19th of June 2024, between 1800 and 2000. No noise associated with cricket activities was audible at the MLs during the survey.

Other Sources: Bird noise and noise from passing pedestrians walking dogs, were occasionally audible during the survey. Neighbourhood noise e.g. somebody sweeping their drive, was audible at ML3 during the attended portion of the survey.

3.5 Summary of Baseline Noise Levels

Measured noise levels have been separated into daytime (0700hrs to 2300hrs) and night-time (2300hrs to 0700hrs) categories, in accordance with current guidance, where appropriate. A summary of average measured noise levels has been provided in **Table 3** and set out in full in **Appendix D**.

Table 3: Summary of Daytime and Night Time Noise Levels

Monitoring Location	Time Period	Measured Noise Level, $L_{Aeq,T}$ dB
ML1	0700 – 2300	70
	2300 – 0700	66
ML2	0700 – 2300	61
	2300 – 0700	57
ML3	0700 – 2300	*54
	2300 – 0700	*46

Monitoring Location	Time Period	Measured Noise Level, $L_{Aeq,T}$ dB
ML4	0700 – 2300	57
	2300 – 0700	54

*Calculated level based on CRTN shortened measurement method and TRL conversion from $L_{A10,18hour}$ to $L_{Aeq,day/night}$.

The measured night-time L_{AFmax} noise levels are summarised in **Table 4**. Measured night-time maxima which are not considered representative of the typical noise environment have been eliminated in accordance with BS8233 and WHO guidance. No night-time measurements were measured at ML3 due to using the shortened CRTN method at this location.

Table 4: Summary of Maximum Night Time Noise Levels

Monitoring Location	Night-time $L_{AFmax, 1min}$, dB
ML1	73
ML2	69
ML4	71

4. Noise Impact Assessment

4.1 Transportation Noise Assessment

4.1.1 Noise Sources

Road traffic noise levels across the Proposed Development have been calculated using SoundPLAN v8.2. Noise sources are defined and calibrated in the model based on measured noise survey data. The following roads have been included as noise sources within the model:

- » M62;
- » Halifax Road; and,
- » Highmoor Lane.

4.1.2 Daytime Noise in Outdoor Living Areas

The lower and upper recommended guideline noise levels for outdoor living areas is 50 dB(A) and 55 dB(A), respectively, in accordance with BS8233 and WHO. Average daytime noise levels across the Site are shown in **Figure 2**.

The orientation of dwellings in order to reduce noise levels in outdoor living areas i.e. positioning private gardens on the screened side of buildings, has been explored in collaboration with the wider design team, on balance with other design factors, prior to this assessment.

Noise levels in private gardens are predicted to be below the upper 55 dB(A) guideline level in the southeastern part of the Site, where they are screened from road traffic noise emissions on Halifax Road and the M62 by the proposed development itself.

Noise levels in private gardens are predicted to be above the upper 55 dB(A) guideline level in the western and northern part of the Site, with one of these plots exceeding 60 dB(A), in the southwest corner of the site, closest to the M62. Therefore, mitigation measures are required to reduce noise levels in outdoor living areas.

4.1.3 Daytime Noise in Outdoor Living Areas with Mitigation

In order to reduce noise levels in private gardens across the Site, mitigation in the form of acoustic barriers and heightened garden fences has been explored. Compromises on barrier height and location have been made during this process, in order to balance other design factors/impacts. The mitigation strategy is shown in **Figure 3** and detailed in **Section 5**.

Average daytime noise levels across the Site, with the inclusion of the proposed scheme of mitigation, are shown in **Figure 4**.

Noise levels are predicted to be below 55 dB(A) within the majority of private gardens across the Proposed Development, with the exception of a single plot in the southwestern corner of the site (Plot 40), where noise levels are between 55dB(A) and 60dB(A).

Furthermore, noise levels exceed 55 dB(A) in small proportion of private gardens in the northern part of the site, closest to Halifax Road. However, given that the majority of garden areas of the affected plots provide noise levels below the BS8233 and WHO health-based guidance level of 55dB(A), it is considered that these gardens provide good habitable and usable space for residents.

With regards to noise levels in outdoor living areas, BS8233 states:

"In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience

of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

Given the proximity of the Site to the M62 and Halifax Road, it is not practical to reduce noise levels in all private gardens to a level below 55 dB(A) across 100% of the private garden areas, as mitigation measures would result in adverse effects on other planning and/or engineering considerations. Furthermore, the Proposed Development benefits from strategic transport links.

In conclusion, as a specific mitigation strategy has been provided and good acoustic design principles have been implemented where possible, the noise impacts are considered to be acceptable in accordance with BS8233 and WHO guidance, as well as national policy. Therefore, it is considered that no additional mitigation is required.

4.1.4 Internal Noise Levels within Habitable Rooms

BS8233 and WHO health-based guidance set out recommended internal ambient noise levels for residential dwellings during the daytime and night-time periods.

Average internal noise levels in bedrooms should not exceed 35 dB $L_{Aeq,T}$ and 30 dB $L_{Aeq,T}$ during the daytime and night-time respectively, in accordance with BS8233 guidance. A maximum noise level of 45 dB L_{AFmax} should not be exceeded more than 10 times through the night-time period, in accordance with WHO health-based guidance.

Internal noise levels within habitable rooms are a function of noise incident upon the façades of the Proposed Development and the building envelope, glazing and ventilation.

Calculated façade noise levels are presented on the following figures:

- » **Figures 5** – Average daytime façade levels;
- » **Figures 6** – Average night-time façade levels; and,
- » **Figures 7** – Night-time maximum façade levels.

Figure 5 to **Figure 7** indicate that a suitable scheme of glazing and ventilation is required to secure suitable internal ambient noise levels recommended by BS8233 and WHO. A detailed scheme of glazing and ventilation is provided in **Section 5** of this report.

4.2 Industrial/commercial Noise Assessment

4.2.1 Noise from Existing Industrial/commercial sources

Hartshead Moor Cricket Club borders the Site. Audio from ML4, during a cricket match played on the 19th June 2024, was listened to and it has been determined that noise from the cricket match was not significant in comparison to the prevailing road traffic noise at the Site. It is therefore not considered necessary to carry out a full assessment of noise from Hartshead Moor Cricket Club as any impacts from the cricket club are likely to be suitably mitigated by the mitigation measures required for road traffic noise at the Site.

No other existing industrial/commercial sources were identified to be audible at the Site and therefore no assessment is required.

4.2.2 Noise from Proposed Fixed Plant

It is not known at this stage whether the dwellings or apartment building will have fixed plant. Therefore, in the absence of this information, plant rating level limits have been determined to avoid the potential for adverse impacts.

The plant rating levels, as defined in accordance with BS4124, should be controlled such that they do not exceed the average background sound level less 5 dB, at any nearby proposed or existing sensitive receptor. The level limits are shown in **Table 5**.

Table 5: Fixed Plant Level Limits

Time Period	Existing Average Background Noise Level, L_{A90} dB	Rating Level Limit, dB
Daytime	54	49
Night-time	49	44

The above noise limits, would indicate a low impact in accordance with BS4142, depending on context and are subject to the final approval of KC. The responsibility to achieve the above would be with those undertaking the building works and proposals should be reviewed by a suitably qualified acoustician during Technical Design.

In advance of this information, consideration should be given to the location of external and/or externally terminating fixed plant, utilising inherent screening of the buildings to minimise the need for specific mitigation. It is also recommended that provisions be made for the selection of low noise equipment, silencers, screens and other attenuation measures where necessary.

4.3 Internal Noise Levels During Overheating Conditions

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, according to requirement O1(2A) (Noise), which specifies internal night-time noise level requirements for bedrooms.

In determining the potential for exceedance of the ADO internal night-time noise level requirements, external noise levels can be compared to recommended external levels provided in ANC and IOA Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O, 2022, which provides an approximate level difference between external and internal noise levels, based on the required open area of a window to purge heat and geo-graphical context, which, for this development is 9 dB. This assumes fully open windows.

A summary of internal night-time noise levels prescribed by ADO is provided in **Table 6**, together with the corresponding external façade noise level.

Table 6: ADO Internal Noise Level Criteria and Corresponding External level

Description	Required Internal Level, dB(A)	Corresponding External Level, dB(A)
Average Night-time Noise Level, $L_{Aeq, T}$	40	49

Description	Required Internal Level, dB(A)	Corresponding External Level, dB(A)
Night-time Maximum Level, L_{AFmax}	55	64

[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)

Night-time façade noise levels from transportation noise sources have been calculated and compared to the corresponding external noise level criterion from **Table 6**. The facades which exceed the criteria due to either average or maximum night-time noise levels are shown in **Figure 8**.

Figure 8 shows that an alternative to open windows as the primary means of overheating mitigation requires consideration, depending on the likelihood of overheating. Overheating, and potential mitigation measures should therefore be investigated by a suitably qualified building services engineer.

It should be noted that the eastern facades of ground floor apartments associated with plots 16-21 do not require any specific overheating consideration, as a result of noise.

Additional information on overheating mitigation is provided in **Section 5**.

5. Noise Mitigation Scheme

5.1 External Mitigation Requirements

The external mitigation requirements are illustrated in **Figure 3**. The requirements comprise:

- A 4.0m high acoustic barrier along the western and part of the northern boundary of the Site; and,
- Fence heights have been increased to 3.0m around the perimeter of some private gardens. All fences should include no perforations and have a minimum surface density of 15kgm⁻².

5.2 Facade Insulation Requirements

This assessment indicates that a suitable glazing and ventilation scheme is required to secure appropriate internal noise conditions, in accordance with BS8233 and WHO guidance, which would allow windows to be closed while maintaining sufficient background ventilation.

In all cases, reliance upon open windows, as a form of background ventilation, would result in the guideline internal noise levels for living room and bedrooms, as recommended in BS8233, to be exceeded in proposed habitable rooms. An alternative form of background ventilation should therefore be implemented to ensure internal noise levels do not exceed the recommended values.

It is considered that windows should remain openable to facilitate purge ventilation (i.e., removal of fumes/odours) and provide additional controls to residents.

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 BS8233, using the level of noise and spectrum at proposed façades.

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

- » Windows are closed;
- » A reverberation time of 0.5 seconds in habitable rooms;
- » A ceiling height of 2.5m.
- » External walls will provide a sound reduction performance that is at least 10 dB better than the specified glazing; and,
- » One acoustic trickle vent per room.

Glazing and ventilation attenuation requirements have been determined, based on example configurations, and are summarised in **Table 7**.

Table 7: Example Glazing and Ventilation Specifications

Key / Specification No.	Preliminary Minimum Sound Reduction Performance (dB)		Example Configuration
	Glazing (R _w + C _{tr})	Ventilation (D _{n,e,w} + C _{tr})	
1	27	35	6/12/6 double glazing, Greenwood 1600DN

Key / Specification No.	Preliminary Minimum Sound Reduction Performance (dB)		Example Configuration
	Glazing (R _w + C _{tr})	Ventilation (D _{n,e,w} + C _{tr})	
2	30	39	10/12/4 double glazing, Renson AK38 vents
3	33	43	10/12/6 double glazing, Renson AK43 vents

A façade mark-up of the layout has been provided corresponding the required degree of attenuation for the daytime, night-time and night-time maximum assessment criteria, **Figure 8**.

The above specification is for planning purposes and should not be used for tendering. Alternative glazing and ventilation may be used providing they achieve the R_w and D_{n,e,w} specifications, but these should be checked by a suitably qualified engineer at the technical design stage.

5.3 Overheating

Noise levels have been assessed at the facades of the proposed dwellings based on the ADO internal ambient noise levels requirements for bedrooms. The assessment indicates that the Proposed Development includes bedrooms which require consideration of alternative means of ventilation to open windows, depending on likelihood of overheating.

ADO recommends that the strategy to reduce overheating risk should be selected according to the location of the new residential buildings and whether it has cross-ventilation.

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

- » 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 requirement O1(2B), mechanical cooling should only be used where insufficient heat is capable of being removed from the indoor environment without it. Regarding this ADO quotes the following:

"It should be demonstrated to the building control body that all practicable passive means of limiting unwanted solar gain and removing excess heat have been used first before adopting mechanical cooling. Any mechanical cooling (air conditioning) is expected to be used only where requirements O1 cannot be met using openings."

It is considered that, in the case of this development where there is semi-detached housing with single occupancy, residents have control over all windows/ventilation, on two or more aspects

(facades) of their home, providing cross-ventilation. This provides significant controls to residents, where windows can be opened within less sensitive rooms, such as kitchens, bathrooms, hallways and landings to allow for ventilation cooling while keeping windows closed within occupied habitable rooms to maintain suitable internal noise levels.

Where required, overheating mitigation measures should be specified by a suitably qualified thermal modelling engineer.

6. Conclusion

Hydrock have been appointed to provide acoustic engineering services in support of a planning application for a proposed residential development in Hartshead Moorside, Cleckheaton, BD19 6LW. This report has been prepared in support of a full planning application for the development.

The application is for the development of 40 residential dwellings, comprising 34 houses, as well as three connected two-storey apartment buildings encompassing six flats.

This noise impact assessment considers the following potential impacts:

- » Existing road traffic noise from vehicle movements on M62, Halifax Road (A649), Highmoor Lane and the remainder of the local road network at sensitive areas of the Proposed Development;
- » Existing entertainment noise from the cricket club at the Proposed Development
- » Existing commercial/industrial noise at the Proposed Development;
- » Fixed plant noise emissions associated with the Proposed Development. at existing and proposed noise sensitive receptors.

A noise survey has been carried out in order to establish the existing noise environment at the Site, during the daytime and night-time periods, in accordance with current guidance.

Road traffic noise from the M62, together with road traffic from Halifax Road (A649), was dominant for the majority of the daytime and night-time periods across the Site. The survey was undertaken during a cricket match at Hartshead Moor Cricket Club, which was not identified to be audible at the Site.

With the inclusion of the specific mitigation strategy provided in this report, the noise impacts are considered to be acceptable in accordance with BS8233 and WHO guidance, as well as national policy.

The existing typical background noise level measured at the Site has been used to establish recommended plant noise limits at Existing Sensitive Receptors. The daytime and night-time plant noise rating limits will ensure a low impact, in accordance with BS4142, depending on context.

The majority of proposed dwellings will require consideration of an alternative ventilation strategy to open windows, as a result of existing noise levels. Overheating mitigation measures should be confirmed acceptable by a suitably qualified building services engineer.

This assessment demonstrates that, with the inclusion of mitigation measures, acceptable acoustic conditions can be achieved within sensitive areas of the proposed development, in accordance with current policy and guidance. Therefore, it's considered that there is no reason for refusal of the application on noise grounds.

Figures



Key

- ▬ Approximate Site Boundary
- Monitoring Location
- Existing Sensitive Receptor

Notes

Revisions

First Issue

CREATED 13/08/2024	CHECKED 13/08/2024
B. LEE	E. GOLDSMITH

now

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

Client

Thirteen Group

Project

29177

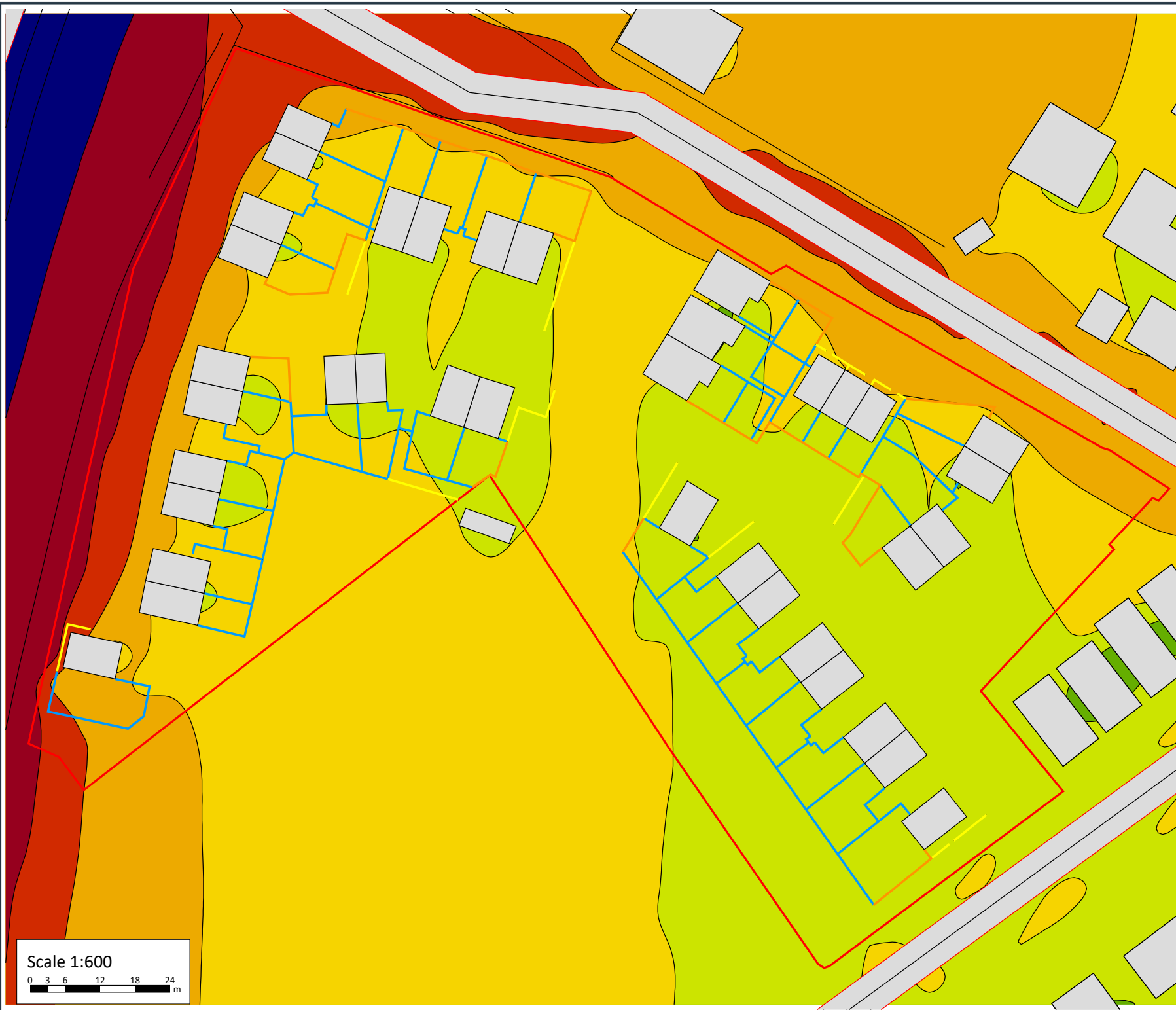
Title

Monitoring Locations and Existing Sensitive Receptors

Hydrock Project Number	Scale
29177	N/A

Purpose	Status
For Information	S2

Figure	
1	P01



Legend

Signs and symbols

- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence

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

	< 45.0
	< 50.0
	< 55.0
	< 60.0
	< 65.0
	< 70.0
	< 75.0
	>= 75.0

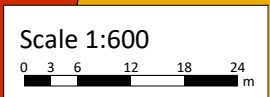
Client
Thirteen Group

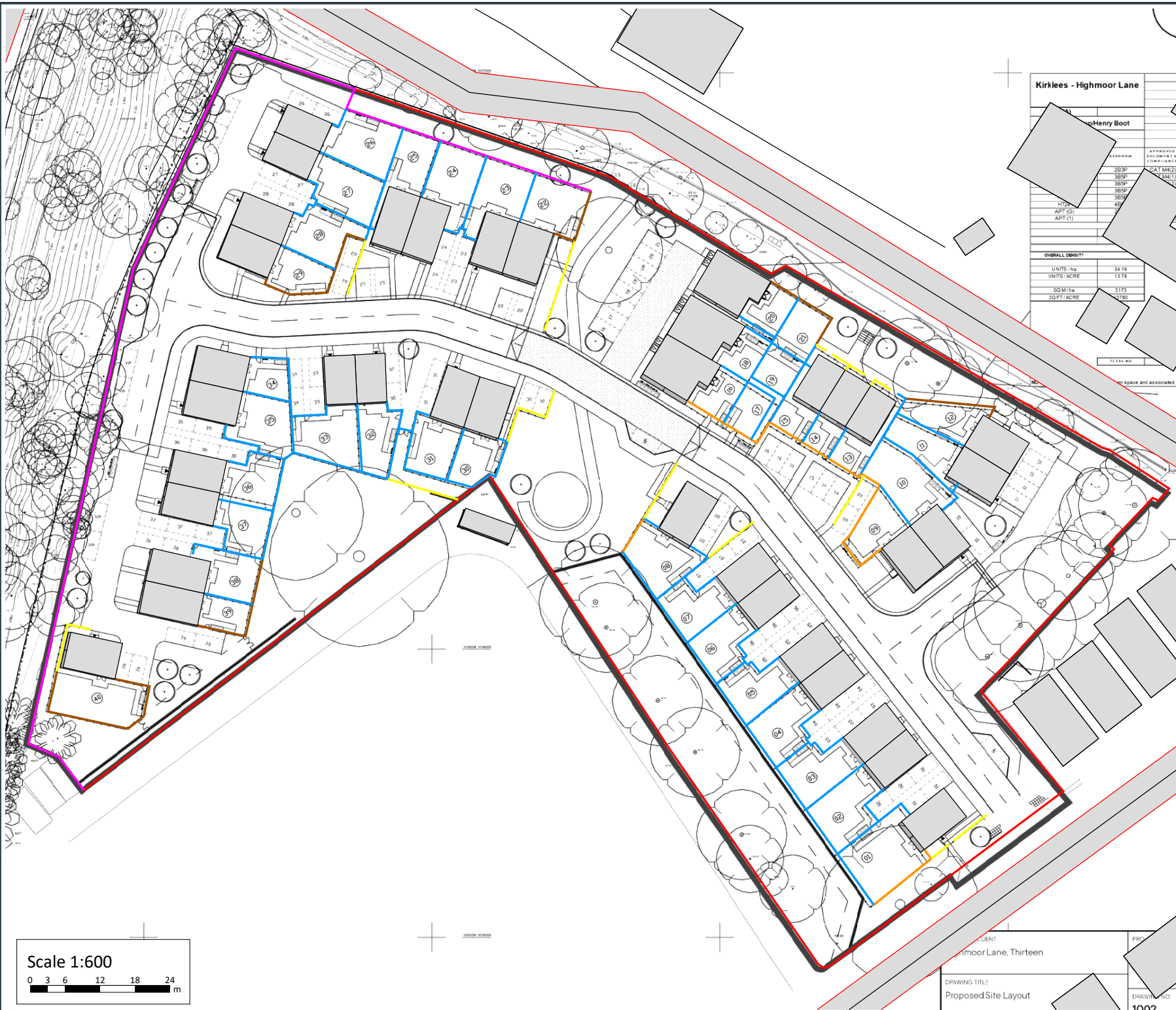
Project
Highmoor Lane, Cleckheaton

Title
**Average External Daytime Levels
 1.5m Above Ground**

Figure **Figure 2** Date **19/05/2025**

Revision P01	Scale 1:600	Drawn BL	Approved EG
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Kirklees - Highmoor Lane

APPROVED BUILDING PLAN COMPLIANCE	
20SP	
30SP	
30SP	
30SP	
30SP	
45SP	
ADPT (G)	
ADPT (L)	
OVERALL DENSITY	
UNITS / ha	34.19
UNITS / ACRE	13.76
SD M/ha	3175
SD FT/ACRE	12780
TOTAL NO	
space and associated	

Legend

Signs and symbols

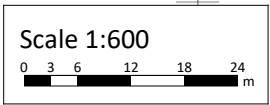
- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence
- 3.0m Fence
- 4.0m Acoustic Barrier

Client
Thirteen Group

Project
Highmoor Lane, Cleckheaton

Title
Acoustic Barrier and Fence Mitigation Strategy

Figure	Figure 3		Date	19/05/2025
Revision	Scale	Drawn	Approved	
P01	1:600	BL	EG	

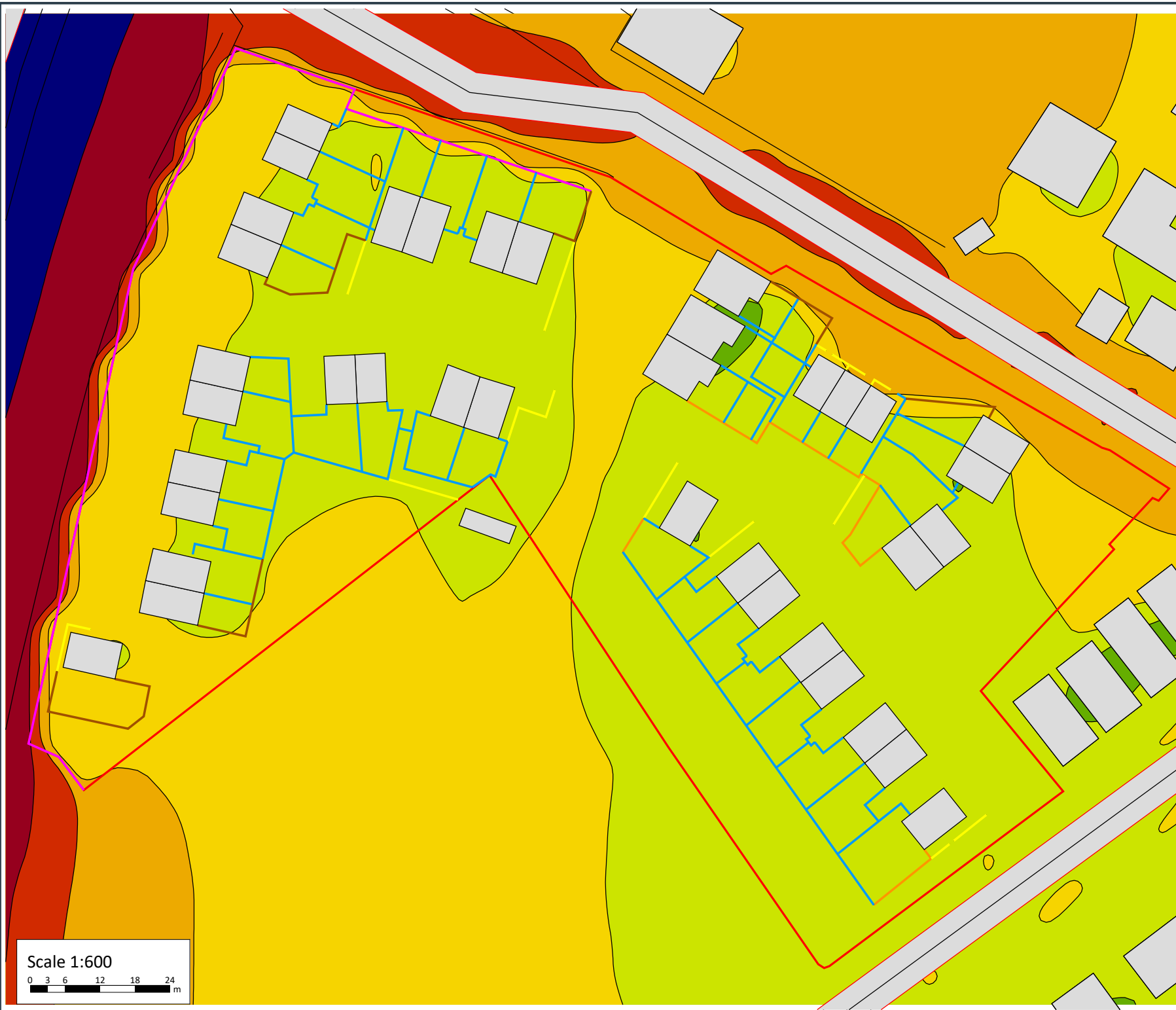


CLIENT
Highmoor Lane, Thirteen

DRAWING TITLE
Proposed Site Layout

DRAWING NO
1002





Legend

Signs and symbols

- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence
- 3.0m Fence
- 4.0m Acoustic Barrier

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

	< 45.0
	< 50.0
	< 55.0
	< 60.0
	< 65.0
	< 70.0
	< 75.0
	>= 75.0

Client
Thirteen Group

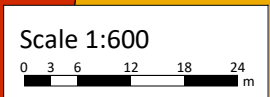
Project
Highmoor Lane, Cleckheaton

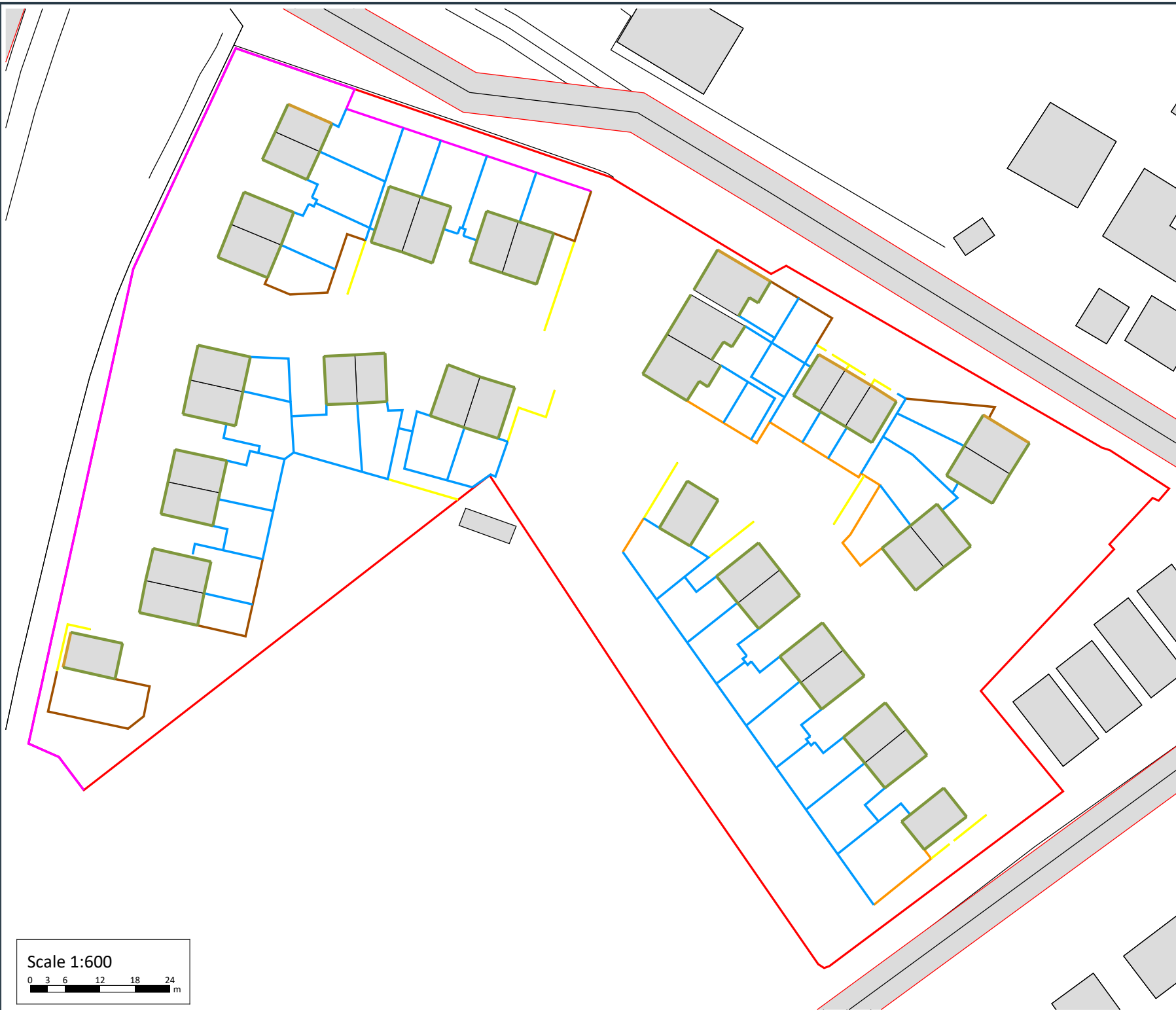
Title
Average External Daytime Levels with Mitigation 1.5m Above Ground

Figure **Figure 4** Date **19/05/2025**

Revision P01	Scale 1:600	Drawn BL	Approved EG
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Hydrock
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Legend

Signs and symbols

- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence
- 3.0m Fence
- 4.0m Acoustic Barrier

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

- < 64.0
- 64.0 <= < 68.0
- 68.0 <=

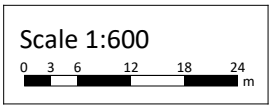
Client
Thirteen Group

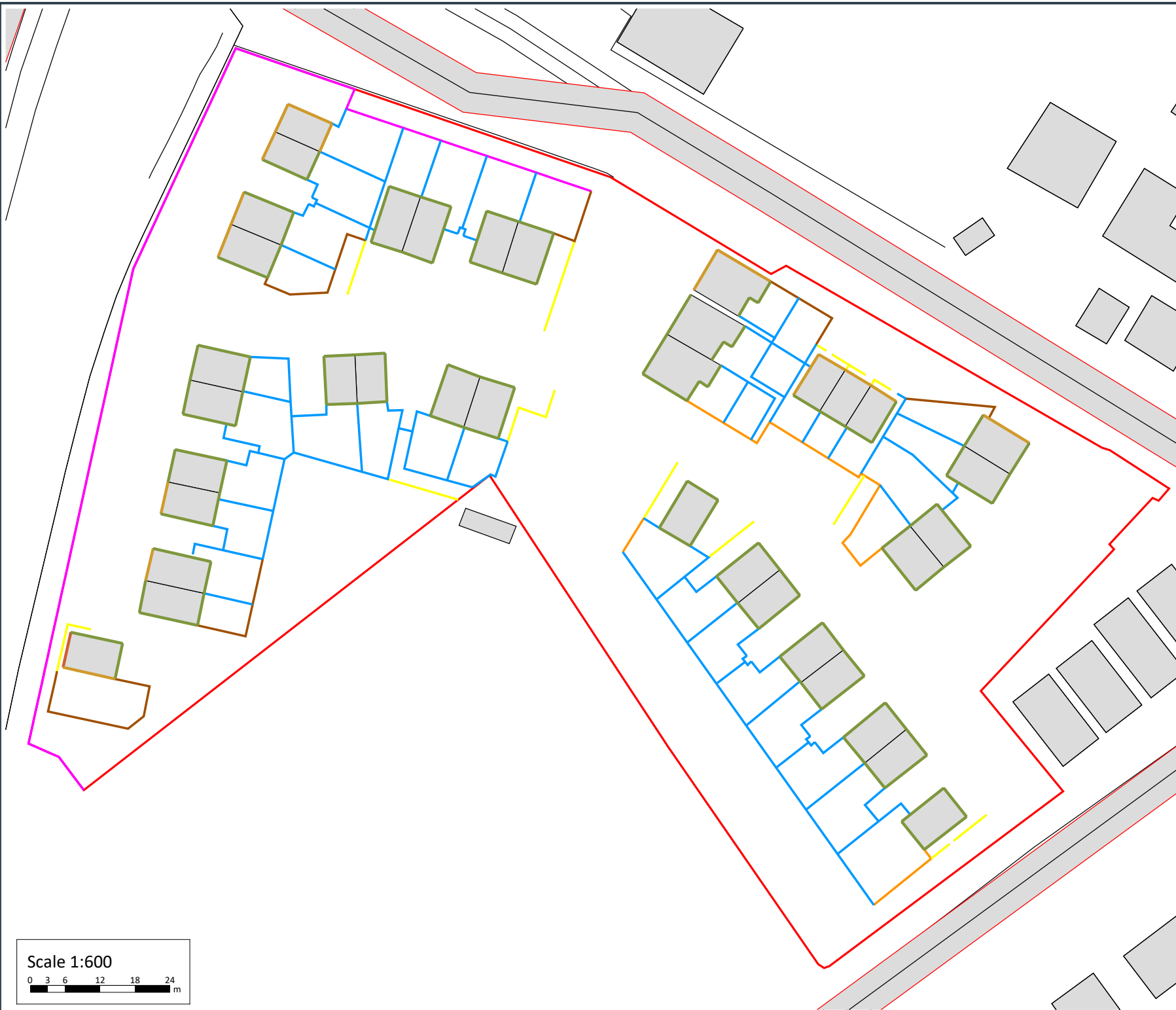
Project
Highmoor Lane, Cleckheaton

Title
Average Daytime Facade Levels

Figure **Figure 5** Date **19/05/2025**

Revision P01	Scale 1:600	Drawn BL	Approved EG
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Legend

Signs and symbols

- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence
- 3.0m Fence
- 4.0m Acoustic Barrier

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

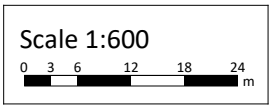
- < 59.0
- 59.0 <= < 63.0
- 63.0 <=

Client
Thirteen Group

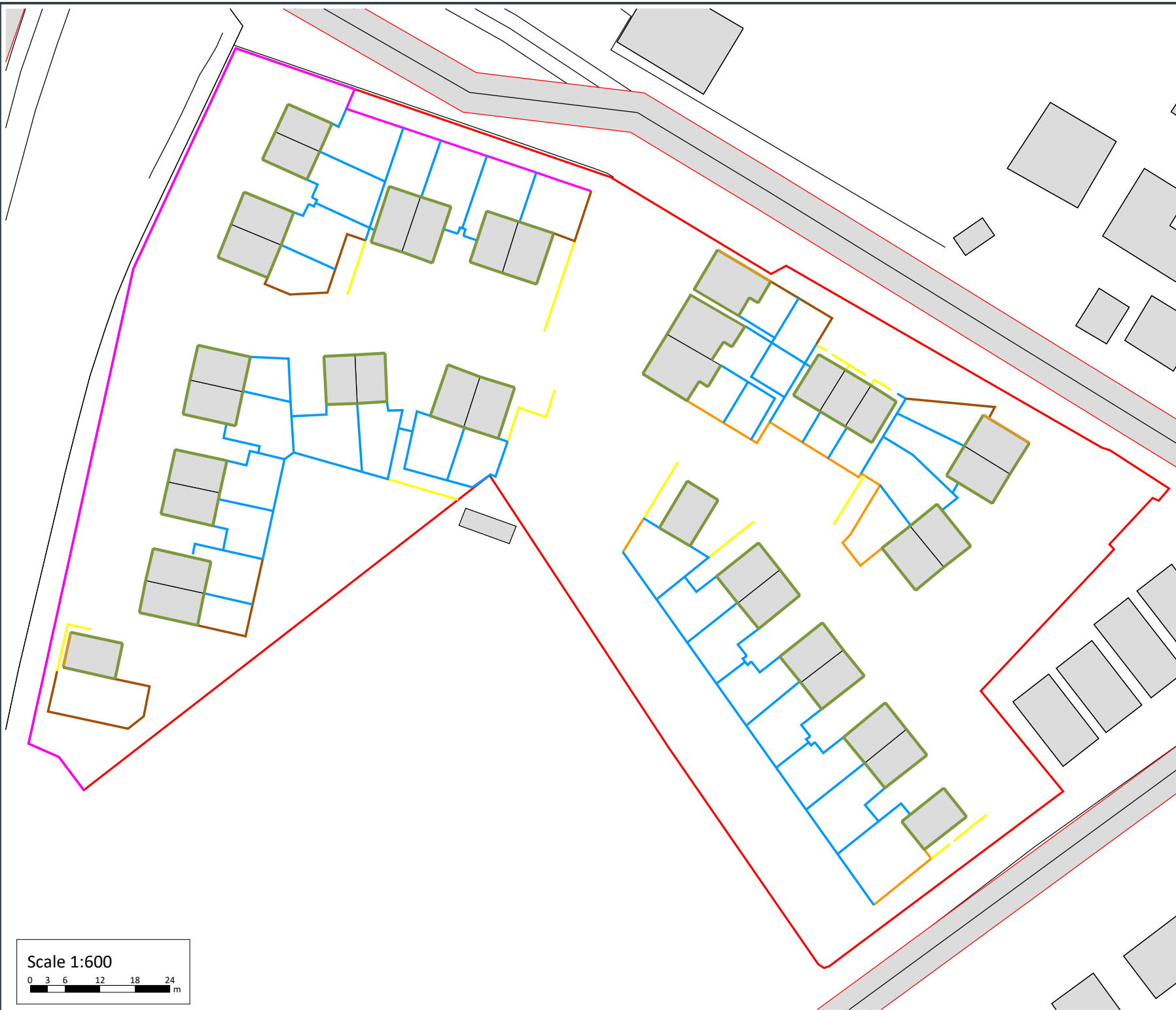
Project
Highmoor Lane, Cleckheaton

Title
Average Night-time Facade Levels

Figure	Figure 6		Date	19/05/2025
Revision	Scale	Drawn	Approved	
P01	1:600	BL	EG	



Hydrock
 now



Legend

Signs and symbols

- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence
- 3.0m Fence
- 4.0m Acoustic Barrier

Night-time L_{AFmax} , dB

- < 70.0
- 70.0 <= < 74.0
- 74.0 <=

Client
Thirteen Group

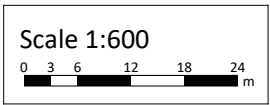
Project
Highmoor Lane, Cleckheaton

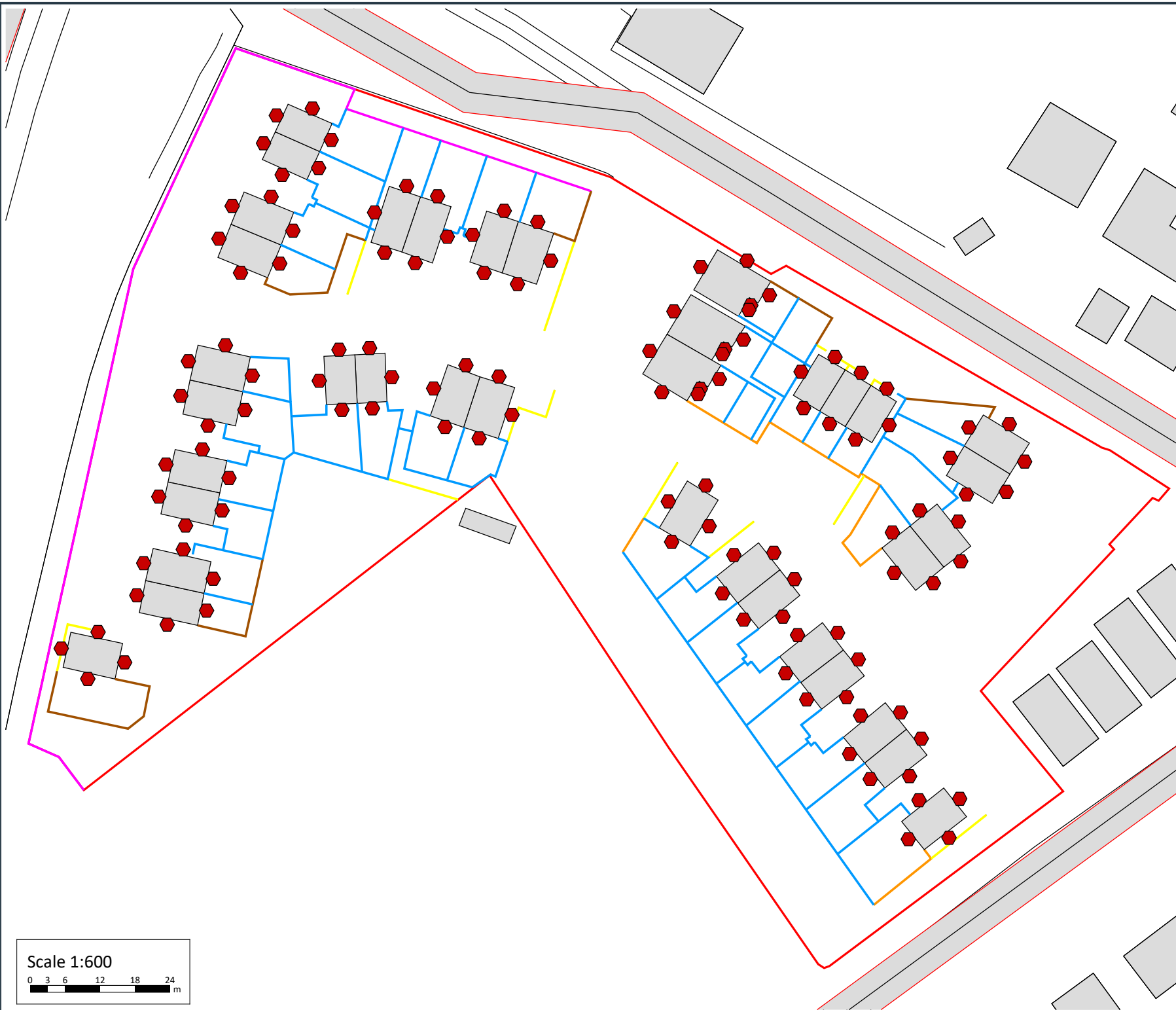
Title
Night-time Maximum Facade Levels

Figure **Figure 7** Date **19/05/2025**

Revision P01	Scale 1:600	Drawn BL	Approved EG
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Hydrock
 now





Legend

Signs and symbols

- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence
- 3.0m Fence
- 4.0m Acoustic Barrier
- Facade point

Overheating Strategy

- Open Windows
- Alternative Strategy

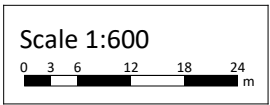
Client
Thirteen Group

Project
Highmoor Lane, Cleckheaton

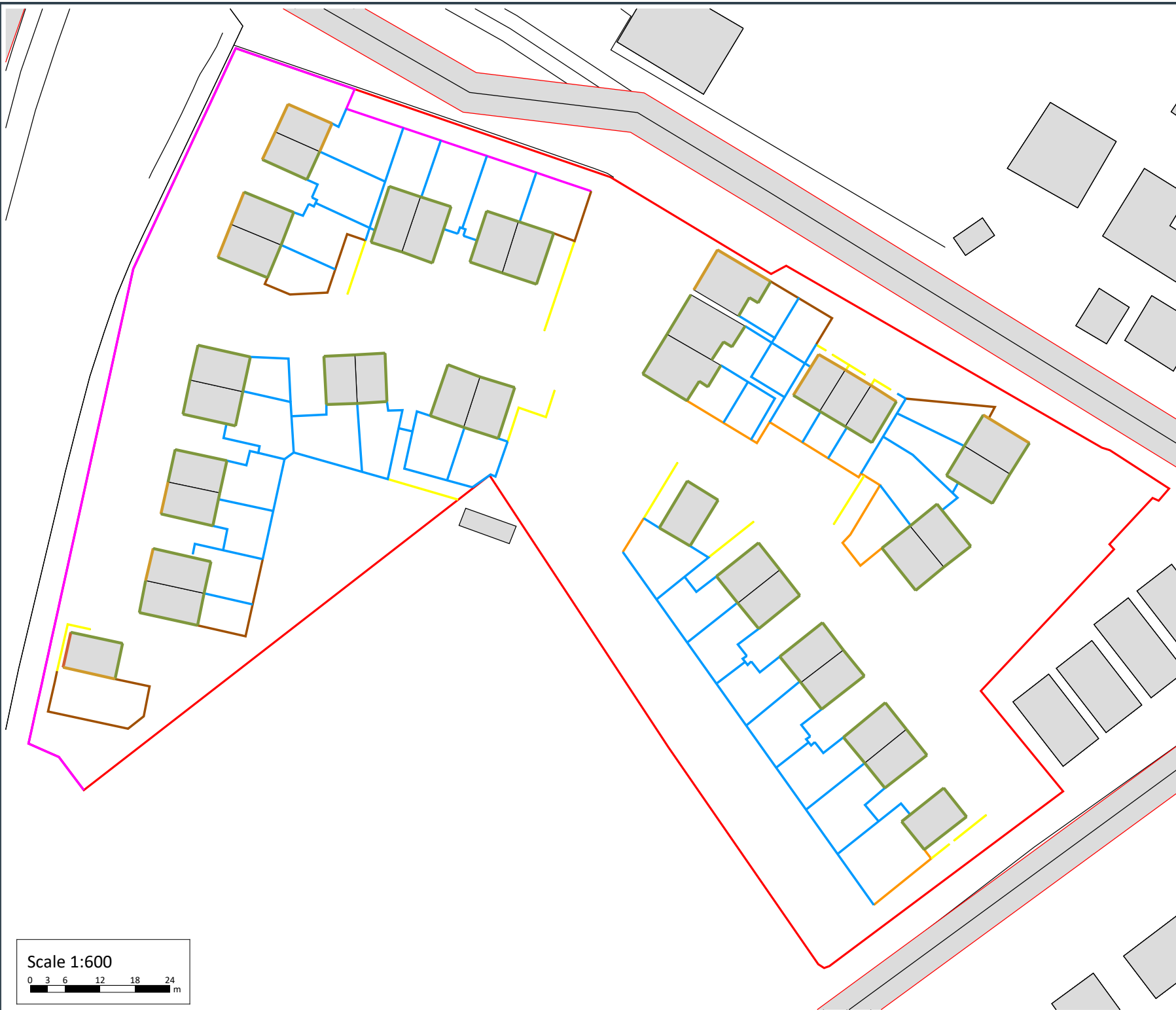
Title
Overheating Strategy Requirements

Figure **Figure 8** Date **19/05/2025**

Revision P01	Scale 1:600	Drawn BL	Approved EG
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Hydrock
 now



Legend

Signs and symbols

- Building
- Road
- Red Line Boundary
- 1.1m Fence
- 1.7m Fence
- 1.8m Fence
- 3.0m Fence
- 4.0m Acoustic Barrier

Glazing and Ventilation Specification

- 1
- 2
- 3

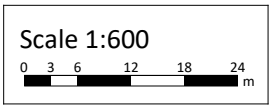
Client
Thirteen Group

Project
Highmoor Lane, Cleckheaton

Title
Night-time Maximum Facade Levels

Figure **Figure 9** Date **19/05/2025**

Revision P01	Scale 1:600	Drawn BL	Approved EG
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Hydrock
 now

Appendix A Glossary

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 (2×10^{-5} Pa).
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 L_{Aeq} 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 L_n 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	R_w 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 (R_w , $D_{n,e,w}$ 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, as measured outside and at least 3m from buildings.

Appendix B Policy, Standards & Guidance

National Planning Policy Framework (NPPF)

Published in December 2023, this document sets out the Government's planning policies for England and supersedes the previous version of the NPPF published in 2021. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

"180. 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:

"191. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the Site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁹;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

69 See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."

And

"193. 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

The recommend noise level for hotel rooms (lodges) is outlined in Section 7.7.5 in BS8233, which refers to Table 4, for domestic buildings, which recommends:

- » Living rooms achieve 35 dB L_{Aeq} during the daytime; and
- » Bedrooms achieve 30 dB L_{Aeq} during the daytime and night-time periods.

Furthermore, Annex H recommends:

- » Bedrooms achieve 30-40 dB L_{Aeq} during the daytime;
- » Bedrooms achieve 25-35 dB L_{Aeq} during the night-time; and,
- » Bedrooms achieve 45-55 dB $L_{AMax,F}$ during the night-time.

The guidance offers a range of target criteria during the day and night-time period, but for the purposes of this assessment the target criteria should be 35 dB $L_{Aeq,16hour}$, 30 dB $L_{Aeq,8hour}$ and 45 dB $L_{AMax,F}$, which accord with the recommended noise levels for permanent residence in BS8233 and The World Health Organisation's Guidelines to Community Noise, 1999.

British Standard 5228: 2014 - Code of Practice for noise and vibration control on construction and open sites

Noise from Construction Plant and Vehicles

Guidance on the assessment of noise from development sites is given in British Standard 5228-1:2009+A1:2014 "Code of Practice for noise and vibration control on construction and open Sites – Part 1: Noise" (BS5228-1), and BRE Controlling particles, vapour and noise pollution from construction Sites, Parts 1 to 5, 2003.

In addition to the guidance from the local authority, the Control of Pollution Act 1974 (COPA 1974) gives the local authority power to serve a notice under Section 60 imposing requirements as to the way in which works are to be carried out. This could specify times of operation, maximum levels of noise which may be emitted and the type of plant which should or should not be used.

However, it might be preferable for the chosen contractor to obtain prior consent under Section 61 of COPA 1974. Section 61 enables anyone who intends to carry out works to apply to the local authority for consent. Under Section 61 the local authorities and those responsible for construction work, have an opportunity to settle any problems, relating to the potential noise, before work starts.

The threshold of potential significant effect at a nearby noise sensitive receptor in accordance with BS5228-1, Appendix E, is set out in the table below. The level is based on the ambient noise level at the Site, when rounded to the nearest 5 dB. The limit value is then compared to the Site noise level to determine the potential for effect.

Example threshold of potential significant effect at dwellings			
Assessment Category and Threshold Value Period ($L_{Aeq,T}$)	Threshold Value, in decibels (dB)		
	Category A *1	Category B *2	Category C *3
Night-time (23:00- 07:00)	45	50	55
Evening and weekends ^{D)}	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Note 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the Site exceeds the threshold level for the category appropriate to the ambient noise levels.

Note 2: if the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

Note 3: Applied to residential receptors only.

*1 Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than this value.

*2 Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

*3 Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are more than this value.

Vibration from Construction Plant and Vehicles

Human Response to Vibration

Guidance on the assessment of vibration from development sites is given in British Standard 5228-2:2009+A1:2014 "Code of Practice for noise and vibration control on construction and open sites – Part 2: Vibration" (BS5228-2).

Human beings are known to be very sensitive to vibration, the threshold of perception being typically in the peak particle velocity (PPV) range of 0.14 mm.s⁻¹ to 0.3 mm.s⁻¹. As vibration increases above these values, they can disturb, startle, cause annoyance or interfere with work activities.

BS6472 provides guidance on human response to vibration in buildings. However, BS6472 is based on BDV and weighted acceleration. For construction, it is considered more appropriate to provide guidance in terms of the PPV, since this parameter is likely to be more routinely measured based on the concern for potential building damage. Furthermore, since many of the empirical vibrations predicted yield a result in terms of PPV, it is necessary to understand what the consequences might be of any predicted levels in

terms of human perception and disturbance. The BS5228-2 guideline construction PPV values, as measured at receptor locations, are set out in the table below.

Vibration Level A),B),C)	Effect
0.14 mms⁻¹	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mms⁻¹	Vibration might be just perceptible in residential environments.
1.0 mms⁻¹	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mms⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

A) The magnitude of the values presented apply to a measurement position that is representative of the point of entry into the recipient.

B) A transfer function (which relates to an external level to an internal level) needs to be applied if only external measurements are available.

C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

Structure Response to Vibration

Cases where damage to a building has been attributed to the effects of vibration alone are extremely rare; even when vibration has been considered to be intolerable by the occupants. People can detect and be annoyed by vibration before there is any risk of structural damage.

Guidance on the assessment of groundborne vibration on building structures is set out in BS7385-2 and BS ISO 4866:201.

The likelihood of vibration induced damage or nuisance will depend upon the nature of the source, the characteristics of the intervening solid and drift geology and the response pattern of the structures around the Site.

Limits for transient vibration, above which cosmetic damage could occur, are given in terms of PPV, in the table below.

Transient vibration guide values for cosmetic damage

Line (see Figure B.1)	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4Hz to 15Hz	15Hz and above
1	Reinforced or framed structures Industrial and heavy commercial building	50mm/s at 4Hz and above	50mm/s at 4Hz and above
2	Unreinforced or light framed structures Residential or light commercial buildings	15mm/s at 4Hz increasing to 20 mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

Note 1: Values referred to are at the base of the building
 Note 2: For line 2, at frequencies below 4Hz, a maximum displacement of 0.6mm (zero to peak) is not to be exceeded.

Minor damage is possible at vibration magnitudes which are greater than twice those in the table, and major damage can to a building structure can occur at values greater than four times the values.

The values in the table are for transient vibration which does not give rise to resonant response in structures. Where the dynamic loading caused by continuous vibration gives rise to dynamic magnification due to resonance, especially in the lower frequencies, then the guideline values may be reduced by up to 50%.

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 ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features to give a 'rating' level ($L_{Ar,Tf}$). The Standard effectively compares and rates the difference between the rating level of the sound and the prevailing background sound level ($L_{A90,T}$). 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."

Design Manual for Roads and Bridges, LA111, Noise and Vibration – Revision 2, 2020 (DMRB)

DMRB provides guidance on defining the magnitude of noise impacts associated with changes in road traffic flows, related to the Proposed Development.

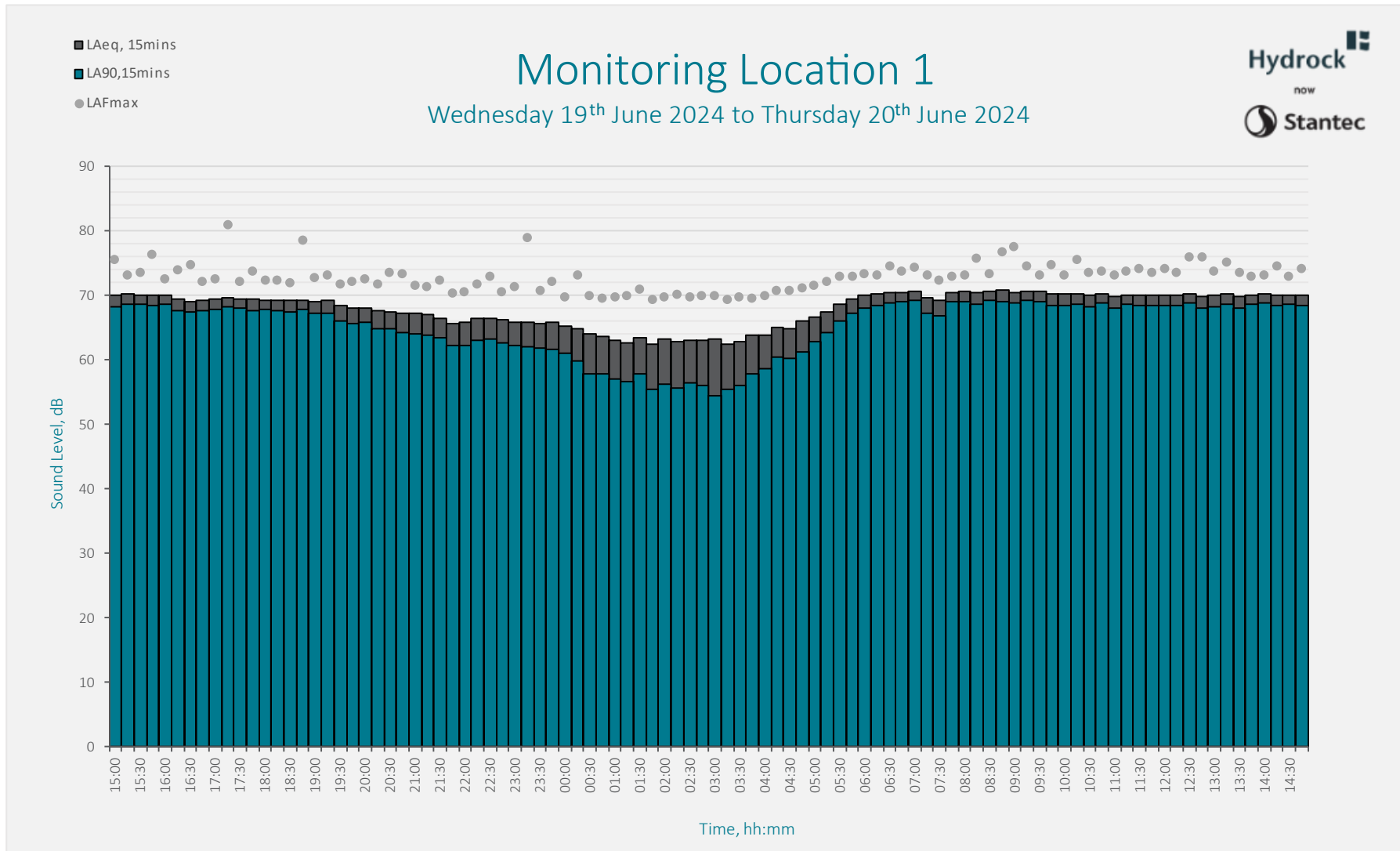
The magnitude of effect can be determined on the basis of a change in road traffic noise level, in terms of $L_{A10,18hour}$, as detailed in Table B1. However, it is considered that the absolute level of road traffic noise is also relevant in the determining of noise impacts.

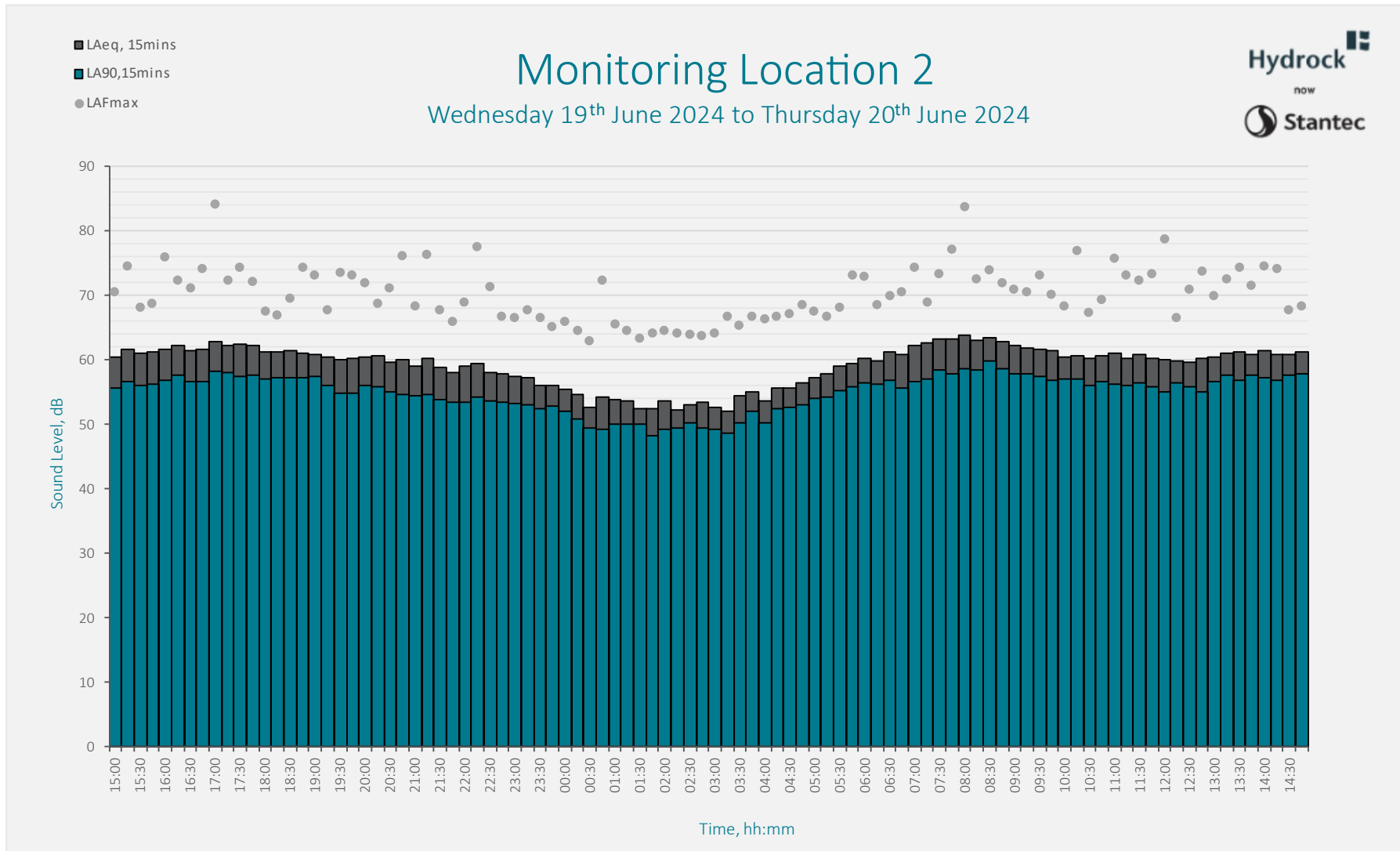
Magnitude	Short Term Change in Noise Level $L_{A10,18hour}$ dB	Long Term Change in Noise Level $L_{A10,18hour}$ dB	Significance of Impact – as described in DMRB
High	≥5.0	≥10.0	Major
Moderate	3.0-4.9	5.0-9.9	Moderate
Low	1.0-2.9	3.0-4.9	Minor
Negligible	0.1-0.9	0.1-2.9	Negligible
	0.0	0.0	No Change

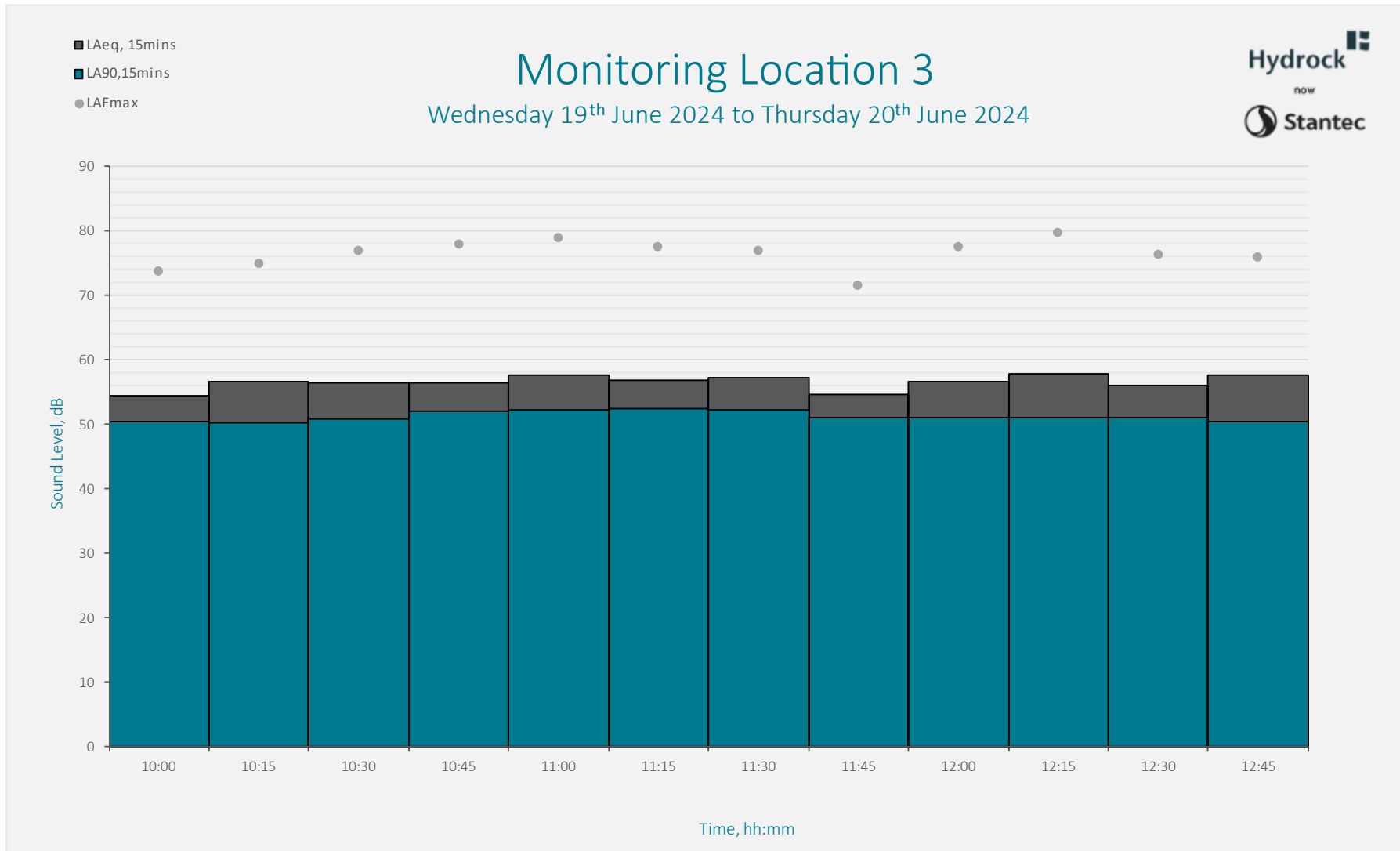
Appendix C Assumptions

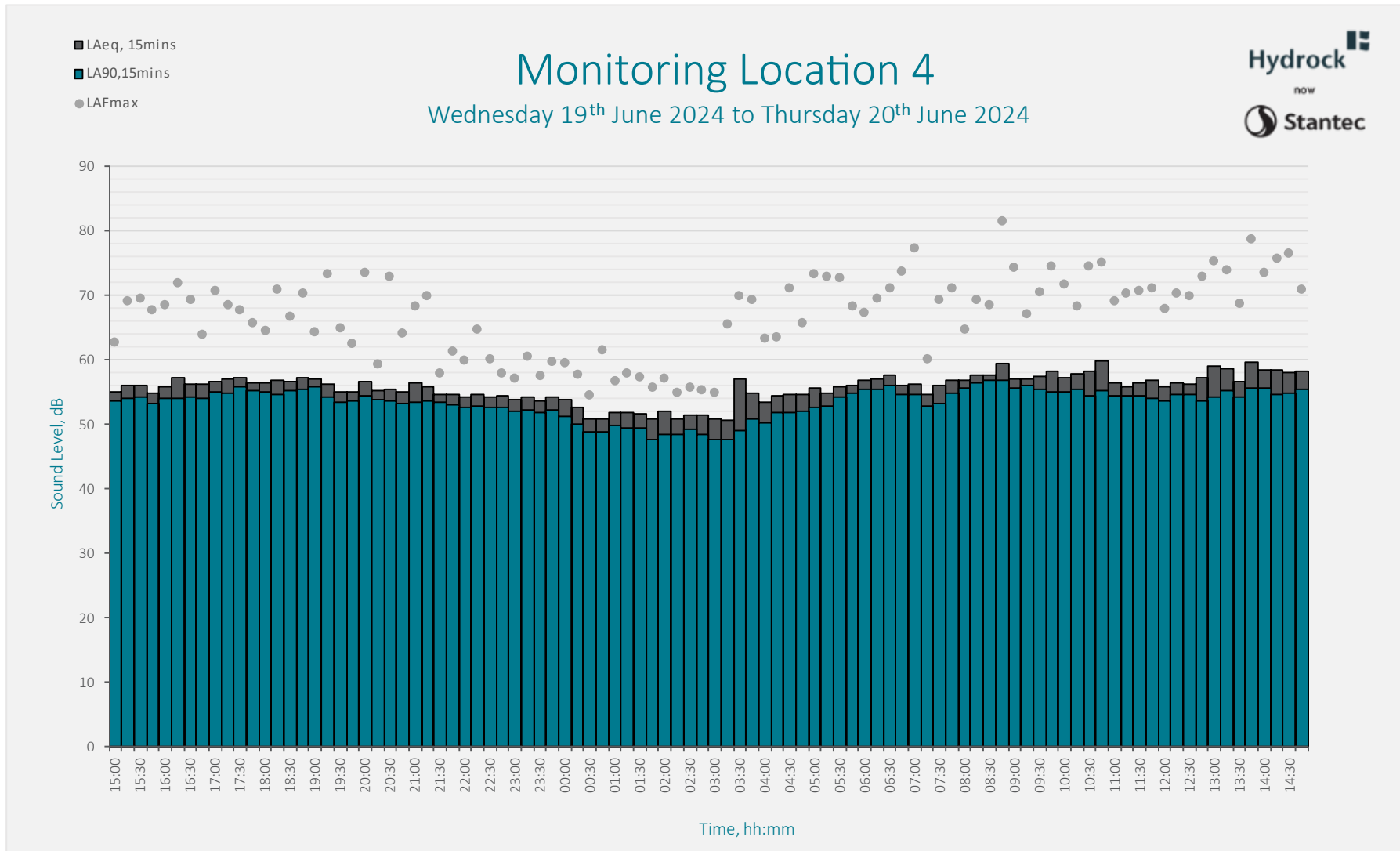
- » Mapping of the Site and the surrounding area was calibrated into the noise model based on known Ordnance Survey grid reference points;
- » A digital terrain model was created using OS Terrain data with a resolution of 5m;
- » The model allows for second order reflections;
- » Ground absorption was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

Appendix D Measured Noise Levels









Appendix E Identification of Background Sound Levels

ML4 - Daytime

Wednesday 19th June 2024

— LA90,1hour
— Chosen L90

