



ENVIRONMENTAL NOISE ASSESSMENT

on behalf of

Lidl Great Britain Ltd

for development at

Telegraph Way, Kirkby, Liverpool L32

8US

Report Number NA103320_v2

Date of Report 24 February 2026

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Summary

A noise assessment has been undertaken to predict the potential impact of noise from the fixed plant and deliveries associated with a proposed Lidl store at Telegraph Way, Kirkby, Liverpool L32 8US.

An environmental sound survey was completed to characterise the existing sound climate at the nearest residential receptors during periods representative of plant operation and delivery activity.

A baseline computer noise model of the proposed development and the surrounding area has been assembled based on the proposed site layout, Lidl's indicative BBS23 schedule plant specifications and previous measurements of delivery noise. The likely noise levels at the nearest noise-sensitive receptors due to noise from the site have been predicted and are presented within this report.

Overall, the assessment indicates a low operational noise impact. Fixed plant performance can be secured through an appropriately worded plant noise condition (with verification as necessary), and delivery activity can be managed through restricted hours to avoid the night-time period.

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Date:	15/10/2025	Date:	15/10/2025

Revision Number	Date	Updated by	Checked by	Changes made
1	24/02/2026	WW	LWT	-EHO comments have been addressed -HGV Refrigeration plant modelled height change from 4 m to 2.5 m to better reflect known dimensions.

Advisory Note

The suitability of any recommended noise mitigation measures within this report should be approved by the relevant architects, structural engineers, building contractors, fire consultants and material manufacturers constituting the wider design team, prior to procurement and field application. This should ensure that when the recommended noise control measures are implemented on site, they will satisfy the requirements of all disciplines, therefore, should not cause any health and safety issues.

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1 Introduction

- 1.1 Miller Goodall Ltd has undertaken a noise assessment to accompany a planning application for a proposed Lidl store at Telegraph Way, Kirkby, Liverpool L32 8US. The scope of this report is to assess the potential impact of operational noise from the deliveries and fixed plant associated with the development on nearby noise-sensitive receptors (NSRs).

2 Policy, Standards and Guidance

- 2.1 The following planning policy and acoustic standards, and guidance have been considered in this assessment.
- Noise Policy Statement for England (NPSE).
 - National Planning Policy Framework (NPPF).
 - BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS 4142).
- 2.2 Further detail is provided in **Appendix 1: Policy, Standards and Guidance**.

3 Assessment Methodology

- 3.1 A BS 4142 assessment has been undertaken in relation to noise from the development. Environmental sound monitoring was undertaken to establish background noise levels at NSRs close to the development. Noise associated with the development has been modelled using CadnaA software and a rating level has been established following the methodology within BS 4142.
- 3.2 The assessment has been completed for the night-time period when the background sound levels are typically lowest to present a worst-case assessment at positions most representative of nearby NSRs.

4 Site Description

- 4.1 The site is located at Telegraph Way, Kirkby, Liverpool L32 8US. The site location is indicated in the figure presented in **Appendix 2: Site Location, Monitoring and NSR Locations**.

- 4.2 The site is in a suburban location on the northwest edge of Kirkby town centre, surrounded by commercial and residential developments. The A506 Hall Lane runs along the northern boundary of the site. Beyond Hall Lane, directly north of the site, is Kirkby Primary School. The nearest NSRs are located across Hall Lane to the north-east. To the south and east lies the rest of Kirkby town centre and its accompanying car parks.
- 4.3 The site is currently occupied by a car park, which, at the time of writing, was still in operation.

5 Proposed Development

- 5.1 The proposed development is a Lidl store. The layout is presented in **Appendix 3: Site Layout**.
- 5.2 Plant for the proposed Lidl supermarket will be provided within the development and will, potentially, operate 24 hours a day, seven days a week. There is, therefore, potential for noise from this to impact NSRs.
- 5.3 Lidl Ltd. has provided Miller Goodall Ltd. with their most up-to-date typical schedule of plant *ref BBS23*. The proposed plant includes:
- 2No. dry coolers, each with an associated pumping station serving food refrigeration.
 - 2No. VRVs serving the sales area;
 - 1No. VRV serving the Warehouse; and,
 - 1No. VRV serving back of house
- 5.4 Noise from deliveries to the store may also impact on nearby NSRs. Lidl typically seeks operational flexibility; however, for this location, it is anticipated that deliveries would be controlled through the planning process. For the purposes of this assessment, a conservative delivery scenario has been considered, and it is proposed that deliveries would be restricted such that no deliveries occur during the night-time period (typically 23:00–07:00). We are seeking agreement to allow deliveries up to 23:00, subject to Environmental Health's acceptance.

6 Local Authority Consultation

- 6.1 Helen Bradshawe, a Senior Environmental Protection Officer at Knowsley Council was contacted by email in respect of the methodology used in this assessment¹. It was agreed that the methodology and assessment were acceptable. Ms Bradshawe advised that levels from any fixed plant are encouraged to be 5 dB below background levels, and that the assessment should include a review of L_{Amax} levels and open windows at sensitive receptor sites.

7 Environmental Sound Survey

7.1 Measurements Procedure

- 7.1.1 Attended environmental sound monitoring was undertaken at one position, located north of the site, across the A506. This monitoring position is considered representative of the existing sound climate at the nearest NSRs to the site. The monitoring was undertaken at times when NSRs would be subject to the lowest level of noise. The monitoring position is indicated in the figure presented in **Appendix 2: Site Location, Monitoring and NSR Locations**.
- 7.1.2 Measurements were undertaken over two periods, from 07:00 hrs on Sunday, 11th May to 09:00 hrs on Sunday, 11th May (Survey 1) and from 03:00 hrs on Monday, 12th May 2025 to 04:00 hrs on Monday, 12th May (Survey 2).
- 7.1.3 The microphone was mounted in the free-field at a height of 1.5 m above local ground level.
- 7.1.4 Measurements were undertaken in accordance with BS 7445-1: 2003².
- 7.1.5 The calibration of the sound level meter was checked before and after the measurements, with negligible deviation (≤ 0.1 dB) recorded.

¹ Email to Helen Bradshawe dated 22/05/2025. Response dated 27/05/2025

² BS 7445-1: 2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

7.1.6 Both positions were monitored with the same equipment. Details of the equipment used are set out in **Table 1**.

Table 1: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1 ^{[4], [5]} Integrating Real Time 1/3 Octave Sound Analyser	NTi XL2-TA	NTi Audio	A2A-11111-E0	16/10/2023	05451/1
Microphone	Nti MA220	NTi Audio	6908	16/10/2023	05451/1
Pre-amplifier	NTi MC230A	NTi Audio	A14423	16/10/2023	05451/1
Class 1 Field Calibrator	CAL 200	Larson Davies	14154	22/08/2024	06881/2
Outdoor Microphone Housing	NTi WP30	NTi Audio	N/A	N/A	N/A

7.1.7 The data has been downloaded using NTi Data Explorer software and analysed using an in-house Excel processing sheet to analytically determine representative L_{Aeq} , L_{A90} and $L_{AF,max}$ sound levels.

7.2 Environmental Sound Climate

7.2.1 During the attended monitoring during Survey 1, at MP1, the residual sound climate was noted to consist primarily of road noise from the A506. When road noise from the A506 was low, distant road noise, thought to be from the M57, and birdsong was audible.

7.2.2 During survey 2, the residual sound climate was similar to the previous survey at both points, but with significantly less road noise from the A506.

7.3 Weather Conditions

7.3.1 Weather forecasts provided by the Met Office ([Weather and climate change - Met Office](#)) and WUnderground ([Local Weather Forecast, News and Conditions | Weather Underground](#)) were reviewed before attending the site to confirm the weather forecast was appropriate for noise monitoring (i.e. dry, windspeed ≤ 5 m/s and no extreme temperatures) over the proposed monitoring period.

7.3.2 Weather conditions were observed during both surveys. A summary of the conditions at the beginning and end of the surveys is provided in **Table 2** and **Table 3**.

Table 2: Dates, times and weather conditions during Survey 1

Measurement Locations	Date/Time	Weather conditions		
		Description	At Start of Survey	On Completion
MP1	11/05/2025, 07:00 to 11/05/2025, 09:00	Temperature:	10 °C	15 °C
		Precipitation:	None	None
		Cloud cover (oktas – see opposite):	6	7
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	No	No
		Wind speed:	2m/s	2m/s
		Wind direction:	Southeast	
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No

Cloud Cover		
Symbol	Scale in oktas (eighths)	
	0	Sky completely clear
	1	
	2	
	3	
	4	Sky half cloudy
	5	
	6	
	7	
	8	Sky completely cloudy

Table 3: Dates, times and weather conditions during Survey 2

Measurement Locations	Date/Time	Weather conditions		
		Description	At Start of Survey	On Completion
MP1	12/05/2025, 03:00 to 12/05/2025, 04:00	Temperature:	13 °C	14 °C
		Precipitation:	None	None
		Cloud cover (oktas – see opposite):	8	6
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	No	No
		Wind speed:	2m/s	2m/s
		Wind direction:	East	
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No

Cloud Cover		
Symbol	Scale in oktas (eighths)	
	0	Sky completely clear
	1	
	2	
	3	
	4	Sky half cloudy
	5	
	6	
	7	
	8	Sky completely cloudy
	(9)	Sky obstructed from view

8 Monitoring Results

8.1 The broadband measurement data for the attended monitoring at MP1 during survey 1 is presented in **Table 4**. All data are sound pressure levels in dB re 20 µPa.

Table 4: Summary of attended sound monitoring results on Sunday, 11th May 2025

Monitoring Position	Period	Start Time hh:mm	Elapsed Time, T hh:mm:ss	$L_{Aeq,T}$ dB	$L_{AF,max}$ dB	$L_{A90,T}$ dB
MP1	Daytime	07:00	00:15:00	64.1	78.6	43.8
	Daytime	07:15	00:15:00	65.2	89.0	43.4
	Daytime	07:30	00:15:00	64.9	81.3	46.7
	Daytime	07:45	00:15:00	65.6	90.5	46.3
	Daytime	08:00	00:15:00	64.4	78.3	44.6

Monitoring Position	Period	Start Time hh:mm	Elapsed Time, T hh:mm:ss	$L_{Aeq,T}$ dB	$L_{AF,max}$ dB	$L_{A90,T}$ dB
	Daytime	08:15	00:15:00	65.4	79.1	45.6
	Daytime	08:30	00:15:00	65.5	77.7	45.3
	Daytime	08:45	00:15:00	65.6	90.0	45.8

8.2 The broadband measurement data for the attended monitoring at MPI during survey 2 is presented in **Table 5**.

Table 5: Summary of attended sound monitoring results on Monday, 12th May 2025

Monitoring Position	Period	Start Time hh:mm	Elapsed Time, T hh:mm:ss	$L_{Aeq,T}$ dB	$L_{AF,max}$ dB	$L_{A90,T}$ dB
MPI	Nighttime	03:00	00:15:00	57.7	77.2	39.1
	Nighttime	03:15	00:15:00	57.8	76.5	40.9
	Nighttime	03:30	00:15:00	53.8	77.1	41.3
	Nighttime	03:45	00:15:00	56.2	77.3	42.5

9 Background Sound Level

9.1 As shortened attended surveys were necessary, it is appropriate to select the lowest measured $L_{A90,1hour}$ and $L_{A90,15min}$ background sound levels for use in the BS 4142 assessment.

9.2 The background sound levels used in the BS 4142 assessments are considered to be;

- **45 dB $L_{A90,1hour}$** in the daytime, this being the modal value of those measured; and
- **39 dB $L_{A90,15min}$** in the night-time, this being the lowest value measured.

10 Noise Modelling Methodology

10.1 A baseline noise model of noise from the proposed development has been assembled using CadnaA noise modelling software.

- 10.2 The general horizontal plan information of the area surrounding and including the proposed development site was imported from Google Earth. This was used to determine road positions, building footprint areas and relative locations and is considered accurate to within 5%.
- 10.3 Topography was imported from the DEFRA LIDAR dataset, and existing building height information was input based on site observations.
- 10.4 The following parameters were assigned to the model:
- Propagation of noise using algorithms within ISO 9613:2024 *Acoustics – Attenuation of sound during propagation outdoors*.
 - Default ground absorption $G = 0.21$. Representing mostly hard ground surrounding the site.
 - No adverse meteorological effects.
 - Two orders of reflection.
 - Buildings are reflecting with smooth non-structured facades.
 - Receiver heights of 4 m for first floor receivers.
 - Grid height for noise contour plots of 4 m, to be representative of the worst-case night-time scenario at the NSRs.
- 10.5 Details of the proposed site layout and associated plant have been obtained from drawings, CAD files and data sheets provided by the client. **Table 6** summarises the documents provided and the information obtained.

Table 6: Technical documentation

Document Title	Document Author	Information obtained
2963 F407E Proposed Site Plan Type1300 – opt5 'Redirect'	HTC Architects	Proposed site layout and Plant Deck Location
BBS 2023 Lidl Corporate Specification, External Plant Layout and Buildersworks	Lidl	Indicative plant layout
374800 – BSE 100kW_Basetec Data Sheet	Bastec	Dry cooler and pumping station noise levels and dimensions
VRV IV S-series heat pump Air Conditioning Technical Data RXYSQ-TY1	Daikin	Noise levels of VRV serving the Warehouse

VRV IV S-series heat pump Air Conditioning Technical Data RXYSQ-TV9	Daikin	Noise levels of VRV serving Back of House
Heating Technical Data RXMLQ-T, RXYLQ-T	Daikin	Noise levels of VRV serving Sales Area
Advancer Spectrum Mastering Multi-temp brochure	Thermo King	Attenuation for HGV Refrigeration Plant on electrical standby

- 10.6 Additional data used in the assessment has been taken from Miller Goodall's library. This includes noise data for HGV movements, HGV refrigeration plant and HGV delivery activities measured at operational Lidl stores.
- 10.7 Sound power levels associated with the fixed plant, HGV movements and delivery activity sources are provided in **Appendix 5: Noise Modelling Parameters**.
- 10.8 All plant is assumed to operate in a steady state with one hundred per cent on-times, during the respective daytime and night-time periods.
- 10.9 The duration of a Lidl delivery is approximately 45 minutes from arrival to departure, including approximately 40 minutes of unloading activity.
- 10.10 A solid barrier of height 1.8 m is proposed around the service yard with sliding gate access for HGVs. This has been modelled as an effective acoustic barrier, and the results of the model rely on this barrier being installed.
- 10.11 **Table 7** summarises the modelling methodology for the plant associated with the proposed development.

Table 7: Summary of baseline CadnaA modelling methodology for proposed plant

Proposed Plant	Methodology
2 No. Food Refrigeration Dry Coolers Bastec, 374800 BSE 100kW	- Modelled as 2 No. respective point sources, each at a height of 1.8 m at a location within the plant area based on indicative External Plant Layout drawing. - Broadband sound power taken from manufacturer's data sheet. - Indicative spectrum shape taken from manufacturer's data sheet for similar pump. - Vertical directivity assigned to represent the fans pointing vertically upwards as indicated on the manufacturer's drawings.

Proposed Plant	Methodology
	Height of unit taken from manufacturer's data sheet.
2 No. Food Refrigeration Pumping Stations Bastec, 374800 BSE 100kW	- Modelled as respective point sources, each at a height of 1 m at a location within the plant area based on indicative External Plant Layout drawing. - Broadband sound pressure at 1 m into spherical radiation taken from manufacturer's data sheet. - Indicative spectrum shape taken from manufacturer's data sheet for similar pump. - Height of unit taken from manufacturer's data sheet.
1 No. VRV serving Warehouse Daikin, RXYSQ12TY1	- Modelled as a point source at a height of 1.6 m at a location within the plant area based on indicative External Plant Layout drawing. - Octave band sound power levels for modelling of daytime operation taken directly from manufacturer's data sheet, assuming maximum duty operation as worst case. - The height of the unit is taken from the manufacturer's data sheet.
1 No. VRV serving Back of House Daikin RXYSQ4TV9	- Modelled as a point source at a height of 1.3 m at a location within the plant area based on indicative External Plant Layout drawing. - Octave band sound power levels for modelling of daytime operation taken directly from manufacturer's data sheet, assuming maximum duty operation as worst case. - The height of the unit is taken from the manufacturer's data sheet.
2 No. VRVs serving Sales Area Daikin RXYLQ12T	- Modelled as a point source at a height of 1.7 m at a location within the plant area based on indicative External Plant Layout drawing. - Octave band sound power levels for modelling of daytime operation taken directly from manufacturer's data sheet, assuming maximum duty operation as worst case. - Vertical directivity assigned to represent the fans pointing vertically upwards as indicated on the manufacturer's data sheet drawings. - The height of the unit is taken from the manufacturer's data sheet.

10.12 **Table 8** summarises the modelling methodology for the delivery activities associated with the proposed development.

Table 8: Summary of baseline CadnaA modelling methodology for delivery activities

Activity	Methodology
HGV Arriving – Engine	- Modelled as a moving point source on a line moving at 8 kmh^{-1} at a height of 1 m. Path of travel corresponding with HGV track indicated on site layout plan, arriving from the east, turning within the yard and then reversing into the loading bay. The source data for HGV deliveries includes tonal reverse alarms; however, white-noise reverse alarms are recommended. - Octave band sound pressure level spectrum at 10 m with hemispherical radiation converted to octave sound power spectrum. 1 event per hour representing a 1-hour daytime assessment period, or 4 events per hour representing a 15 minute night-time assessment period*¹. as a worst case. - The height of the source is based on observations when source measurements were undertaken.
HGV Arriving – Refrigeration Plant	- Modelled as a moving point source on a line moving at 8 kmh^{-1} at a height of 2.5 m, representing the height of the top of the refrigeration plant behind the drivers cab. Path of travel corresponding with HGV Arriving – Engine path noted above. - Octave band sound pressure level spectrum at 11.5 m with hemispherical radiation converted to octave band sound power spectrum. 1 event per hour representing a 1-hour daytime assessment period, or 4 events per hour representing a 15-minute night-time assessment period*¹. as a worst case. - The height of the source is based on observations when source measurements were undertaken, corresponding with the top of the refrigeration plant behind the driver's cab.
HGV Departing – Engine	- Modelled as a moving point source on a line moving at 8 kmh^{-1} at a height of 1 m. Path of travel corresponding with HGV track indicated on site layout plan, moving forwards out of the bay to the western site boundary. - Octave band sound pressure level spectrum at 10 m with hemispherical radiation converted to octave sound power spectrum. 1 event per hour representing a 1-hour daytime assessment period, or 0 events per hour representing a 15-minute night-time assessment period*¹. as the arrival is used as worst case. - The height of the source is based on observations when source measurements were undertaken.
HGV Departing – Refrigeration Plant	Modelled as a moving point source on a line moving at 8 kmh^{-1} at a height of 2.5 m. representing the height of the top of the refrigeration plant behind the driver's cab. Path of travel corresponding with HGV Departing – Engine path noted above.

Activity	Methodology
	• Octave band sound pressure level spectrum at 10 m with hemispherical radiation converted to octave band sound power spectrum. • 1 event per hour representing a 1-hour daytime assessment period, or 0 events per hour representing a 15-minute night-time assessment period*¹. as the arrival is used as worst case. • The height of the source is based on observations when source measurements were undertaken, corresponding with the top of the refrigeration plant behind the driver's cab.
HGV Unloading	• Modelled as a line source at a height of 2 m above the loading bay ramp. representing the maximum likely height of the unloading activities. • Octave band sound pressure level spectrum at 10 m with hemispherical radiation converted to octave band sound power spectrum. • 40 minutes per hour on-time representing a 1-hour daytime assessment period, or 60 minutes per hour representing a 15-minute night-time assessment period*¹. • Height of source based on observations when source measurements were undertaken, corresponding with a distance of approximately 0.5 m above the floor of the container.
HGV Refrigeration Plant – Stationary	• Modelled as a point source at a height of 2.5 m, representing the height of the top of the refrigeration plant at a location behind the driver's cab. • Octave band sound pressure level spectrum at 11.5 m with hemispherical radiation converted to octave band sound power spectrum. • 40 minutes per hour on-time representing a 1-hour daytime assessment period, or 60 minutes per hour representing a 15-minute night-time assessment period*¹.
HGV Unloading <i>L_{AFmax}</i> levels	• A point source has been attributed with sound levels derived from historically measured <i>L_{AFmax}</i> levels of a Lidl delivery at a height of 2 m above the loading bay.

*¹. The software allows a 1-hour assessment period only. As such, parameters are adjusted to achieve an equivalent 15-minute specific *L_{Aeq}* noise level.

11 Noise Sensitive Receptors and Modelled Noise Levels

11.1 **Table 9** sets out the noise levels predicted at the worst affected NSRs that have been considered within the assessment and included within the noise model. These NSR locations are indicated in the figure presented in **Appendix 2: Site Location, Monitoring and NSR Locations**.

Table 9: Modelled noise levels and noise sensitive receptors

Noise Sensitive Receptor (NSR)		Modelled Specific Noise Level dB $L_{Aeq,Tr}$		Modelled L_{AFmax} Level dB
Reference	Description	Cumulative Plant & Delivery,	Plant Only,	Delivery only
NSR1	Kirkby C of E School, Hall Lane	41	40	58
NSR2	1 Hall Lane	37	36	45
NSR3	3 Milbrook Drive	35	34	39

11.2 Figures showing the output from the baseline noise model for the assessment scenarios are presented in **Appendix 6: Noise Model Output**. The figures show the predicted noise levels at receiver locations and corresponding noise contours.

12 Initial BS 4142 Assessment

12.1 Overall Delivery Noise and Plant Noise Assessment

12.1.1 An assessment of delivery noise and plant noise has been undertaken for the daytime and the night-time periods for the worst-affected receptors.

12.1.2 Acoustic feature corrections have been considered for the various noise sources associated with delivery noise and plant noise.

12.1.3 Analysis of modelled contributions from individual delivery noise sources indicates that the hourly averaged noise level is likely to be driven by the refrigeration plant and HGV engine

whilst the HGV is arriving and departing. The residual sound level at NSR1 is relatively high due to traffic noise from the A506 during the day. However, this noise decreases during the night period and, as these noise events are transient, the short-term 'real-time' noise level would be greater. On this basis, a 3 dB acoustic feature correction has been applied for the potentially perceptible impulsivity of unloading activities during the night-time scenario, based on the likelihood of the noise being readily distinctive.

- 12.1.4 Reversing manoeuvres are part of the delivery scenario, and the adopted delivery source data includes tonal reversing alarms as a worst case. However, as a good practice measure, and to minimise nuisance risk, it is recommended that site deliveries utilise broadband (white-noise) reversing alarms where practicable and under Lidl's control. .
- 12.1.5 In terms of acoustic characteristics for the mechanical plant, the proposed plant utilises modern fan and motor technology (for example, EC motors and or variable-speed drives) and is selected such that no readily distinguishable tones arise at noise-sensitive receptors. On this basis, no tonal acoustic feature correction has been applied within the assessment.
- 12.1.6 BS 4142 impulsive character relates to short-duration, high rate-of-change events. The proposed cooling and ventilation plant does not involve impact mechanisms or impulsive operations in normal use. Plant operation is expected to be mostly continuous with controlled modulation, rather than comprising impulsive events. Accordingly, no impulsivity correction has been applied.
- 12.1.7 BS 4142 intermittent character relates to sound that switches on and off, or otherwise varies in a manner that is readily distinguishable and attracts attention. The proposed cooling and ventilation plant is expected to be controlled to modulate gradually in response to demand, with slow ramping up / down of fan and compressor speeds. This operational mode therefore typically produces a relatively steady acoustic output with gentle level changes, rather than distinct on/off cycling.
- 12.1.8 On this basis, no intermittency correction has been applied. As with tonality, the operational character can be confirmed during commissioning. It is recommended that the final plant control strategy is configured to avoid rapid cycling where practicable, and that post-installation verification measurements confirm the rating level and any applicable acoustic feature corrections at the nearest noise-sensitive receptors.

12.1.9 On the basis of the manufacturer sound power data adopted, no specific tonal or impulsive features are predicted at the NSRs. Notwithstanding this, BS 4142 character corrections are ultimately determined by on-site subjective audibility, and therefore these aspects should be confirmed during post-installation verification.

12.1.10 The BS 4142 assessment of noise impact at the most affected NSRs is presented in **Table 10**.

12.1.11 The row for NSR1 during the night-time period has been removed, as it is a school and so will not be occupied during the night-time periods.

Table 10: BS 4142 Assessment of cumulative delivery noise and plant noise

Assessment Period	Receptor	Background Sound Level, dB $L_{A90,T}$	Specific Noise Level ^{*1} , dB $L_{Aeq,Tr}$	Acoustic Feature Correction dB	Rating Level ^{*1} , dB $L_{Ar,Tr}$	Excess of Rating level over Background Sound level dB	Initial Estimate of Impact, Depending on Context
Daytime	NSR1	45	41	0	41	-4	Low Impact
Daytime	NSR2	45	37	0	37	-8	Negligible to Low Impact
Daytime	NSR3	45	35	0	35	-10	Negligible Impact
Night-time	NSR2	39	37	+ 3	40	+ 1	Low to Adverse Impact
Night-time	NSR3	39	35	+3	38	-1	Low Impact

*1. For daytime scenarios, the assessment periods T and Tr is 1 hour. For the night-time scenario, the assessment period Tr is 15 minutes.

12.1.12 NSR1 has not been considered in the night-time assessment as it will not be operational during the night-time period. The outcome of the initial BS 4142 assessment indicates a negligible to low impact for the daytime scenarios and low to adverse impact for the night-time scenarios, depending on the context.

12.1.13 The biggest contributions to the cumulative sound levels predicted at the NSRs are from the Idle HGV refrigeration plant at the loading bay, and the Sales Area VRVs, with HGV movements close behind.

12.2 Plant Noise Assessment

12.2.1 In order to determine whether the plant noise fits with the Local Authority's guidance, a second BS 4142 assessment has been done with only the plant noise modelled. **Table 11** shows the noise levels in this scenario.

Table 11: BS 4142 Assessment of plant noise

Assessment Period	Receptor	Background Sound Level, dB $L_{A90,T}$	Specific Noise Level ¹ , dB $L_{Aeq,Tr}$	Acoustic Feature Correction dB	Rating Level ¹ , dB $L_{Ar,Tr}$	Excess of Rating level over Background Sound level dB	Initial Estimate of Impact, Depending on Context
Daytime	NSR1	45	40	0	40	-5	Negligible to Low Impact
Daytime	NSR2	45	36	0	36	-9	Negligible Impact
Daytime	NSR3	45	34	0	34	-11	Negligible Impact
Night-time	NSR2	39	36	0	36	-3	Low Impact
Night-time	NSR3	39	34	0	34	-5	Negligible to Low Impact

Context

- 12.2.2 The assessments presented in **Table 10** and **Table 11** detail the results of the initial numerical assessment of noise levels at the most affected NSRs. The numerical assessment of impact is influenced by the context of the proposals, including the surrounding environment and the operating characteristics. The surrounding environment is a suburban area with relatively high background sound levels and an environmental sound climate dominated by road traffic noise from the A506. Residents nearby are therefore likely accustomed to noise from vehicles in both the daytime and night-time periods.
- 12.2.3 The exceedances of the background sound level from cumulative operations during the night-time are minor and are driven by delivery noise. These low impacts also arise only when background noise levels are at their lowest.
- 12.2.4 An assessment of the $L_{A\text{Fmax}}$ levels resulting from deliveries has been undertaken and is presented in **Section 13** of this report to provide further context.

Outcome

- 12.2.5 Based on the BS 4142 assessment presented in **Table 10** and **Table 11**, and with consideration of the context described above, it is considered that the overall impact of cumulative delivery noise and plant noise is likely to be low during both the daytime and low to adverse night-time periods.
- 12.2.6 During the night-time period, fixed plant noise is at least 5 dB below background at NSR3 and is not applicable at NSR1 for that period. At NSR2, the predicted plant rating level does not achieve the requested criterion of 5 dB below background during the night-time period.
- 12.2.7 Given that cumulative daytime operations are predicted to result in negligible to low impact, we recommend that HGV deliveries are conditioned to occur within 07:00 to 23:00, consistent with standard daytime and night-time definitions.
- 12.2.8 In addition to the service yard barrier, it should be noted that the final mitigation package can only be confirmed once final plant selection, locations and duty are fixed at detailed design stage. The assessment is based on the proposed service yard barrier as shown on the submitted layout; further increases in barrier height were considered as part of internal option testing and were not found to provide a material improvement at the nearest

receptors, with barrier reflections limiting the net benefit. In practice, the most effective control of delivery noise is the proposed restriction of HGV deliveries to 07:00–23:00

12.2.9 Lidl has confirmed that the plant noise data used in this assessment is indicative, with final plant selection to be confirmed at the detailed design stage. Final plant selection should therefore take due regard of the requirement to achieve the requested criterion at the worst-affected receptor, including selection of lower-noise plant options while still meeting the required thermal loads. Where required, mitigation could comprise local screening/barriers, acoustic louvres, enclosures, and attenuation measures as appropriate, with the final scheme to be confirmed and verified following plant selection

12.2.10 To ensure the final plant selection achieves the required 5 dB below background at the worst-affected receptor, it is recommended that a planning condition secures submission of the final plant specification, any required mitigation, and pre-completion verification testing. The following wording has been used previously for a Lidl store:

"Prior to the installation of any external plant, the specification of plant and an acoustic report, together with details of any mitigation measures required, shall be submitted to and approved in writing by the Local Planning Authority. Any external plant shall thereafter be installed and maintained in accordance with the approved information"

12.2.11 Further context for delivery noise is provided in the assessment of delivery L_{Amax} levels below. In Version 2 of this report, this discussion is not relied upon to justify night-time operation, as deliveries are recommended to be restricted to 07:00 to 23:00.

13 Delivery L_{AFmax} Level Analysis

13.1 The EHO previously requested an analysis of L_{AFmax} levels resulting from delivery activity, noting that the greatest potential for disturbance would arise during the night-time period. Following the EHO's comments, night-time deliveries are no longer being pursued, and deliveries are proposed to be restricted to 07:00–23:00. The L_{Amax} analysis is retained for context and to provide reassurance in relation to the proposed daytime delivery period.

13.2 Historical measurement data from delivery operations at an existing Lidl in Wigan have been input into a point source in the CadnaA 3D noise model. The HGV delivery L_{AFmax} measured at the Wigan Lidl was 85 dB(A) measured at 10 m from the source. The resulting

sound power of the point source is presented in **Appendix 5: Noise Modelling Parameters**. The point source is located at the delivery bay and no screening from the HGV itself is assumed.

- 13.3 The worst-case predicted L_{AFmax} level at a noise-sensitive receptor is predicted to be 58 dB at NSR 1, and 45 dB at NSR 2. These results are presented in **Appendix 6: Noise Model Output**.
- 13.4 Assuming a worst-case scenario where the occupant of the dwelling/school has their window open, an assumption regarding the sound reduction through an open window is required to determine the resulting internal L_{AFmax} level.
- 13.5 The generally accepted rule of thumb is that a window left open for ventilation provides 10 – 15 dB attenuation from external noise sources with the WHO Guidelines for Community Noise suggesting 15 dB. The DEFRA report NANR116: Open/Closed Window Research³ suggests the figure to be between 12 and 18 dB. Given these ranges, a conservative estimation of 13 dB reduction through an open window is an appropriate figure to apply in this instance.
- 13.6 Applying 13 dB attenuation to the predicted 58 dB L_{AFmax} gives an estimated internal maximum level of 45 dB(A) within the school. For context, the WHO Guidelines for Community Noise reference 45 dB L_{AFmax} as a benchmark related to avoidance of sleep disturbance; while the school is a daytime receptor, this provides useful reassurance that short-duration maximum events of this magnitude are unlikely to result in an adverse effect during daytime use. Likewise, a predicted external level of 45 dB L_{AFmax} at NSR2 would reduce to approximately 32 dB internally with windows open.
- 13.7 L_{AFmax} levels resulting from proposed delivery operations are, therefore, predicted to be within suitable levels at the nearest receptors during the daytime delivery period (07:00 – 23:00).

³ NANR116: 'Open/closed window research' Sound Insulation through ventilated open windows, Defra April 2007

14 Summary and Conclusion

- 14.1 A noise assessment has been undertaken to predict the potential impact of noise from a proposed Lidl store at Telegraph Way, Kirkby, Liverpool L32 8US on nearby noise-sensitive receptors (NSRs).
- 14.2 An environmental sound survey has been undertaken at the site to establish the existing sound climate at the nearby residential NSRs.
- 14.3 A computer noise model of the development and surrounding site has been produced based on the proposed site layout.
- 14.4 BS 4142 assessments have been undertaken based on the measured background sound levels and the modelled noise levels due to emissions associated with the development proposals.
- 14.5 An analysis of L_{AFmax} levels resulting from delivery activity indicates that internal maximum noise levels would be suitable at the nearest receptors during the proposed daytime delivery period. At NSR1 (Kirkby C of E School), a predicted external L_{Amax} level of 58 dB at the façade corresponds to an estimated internal level of approximately 45 dB with windows partially open. For context, the WHO Guidelines for Community Noise refer to 45 dB L_{Amax} as a benchmark related to avoidance of sleep disturbance; while the school is a daytime receptor, this provides reassurance that short-duration maximum events of this magnitude are unlikely to cause disturbance or interfere with normal daytime use.
- 14.6 Based on the assessments undertaken, noise emissions from the proposed development are predicted to have a low impact overall, subject to appropriate operational controls. In light of the EHO's comments regarding night-time background sound level exceedances, it is recommended that HGV delivery hours are controlled by condition such that deliveries are restricted to 07:00–23:00, with fixed plant to be controlled via a plant noise condition and verification where required to achieve the requested night-time criterion at the worst-affected receptor. On this basis, there is no reason for the development to be refused planning permission on noise grounds.

APPENDICES

Appendix 1: Policy, Standards and Guidance

1 Noise Policy Statement for England

- 1.1 The Noise Policy Statement for England (NPSE⁴) sets out the long-term vision of noise policy. The Noise Policy aims, as presented in this document, are:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse effects on health and quality of life;*
- *mitigate and minimise adverse effects on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

- 1.2 The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.

- 1.3 The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

“...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development”.

- 1.4 Importantly, the NPSE goes on to state:

“This does not mean that such adverse effects cannot occur”.

⁴ Noise Policy Statement for England, Defra, March 2010

- 1.5 The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available"

- 1.6 It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

2 National Planning Policy Framework

- 2.1 The National Planning Policy Framework (NPPF⁵) was updated most recently in December 2024. The NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

- 2.2 At par. 187 NPPF advises that:

"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..."

⁵ National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2023

2.3 Par. 198 goes on to state:

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

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

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

2.4 Par. 200 seeks to ensure that any development does not prejudice the legally permitted operations and activities of other, existing non-residential uses, stating:

“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.”

3 BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’

3.1 BS 4142:2014+A1:2019⁶ provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the

⁶ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

3.2 The Specific Noise Level – the noise level produced by the source in question at the assessment location – is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

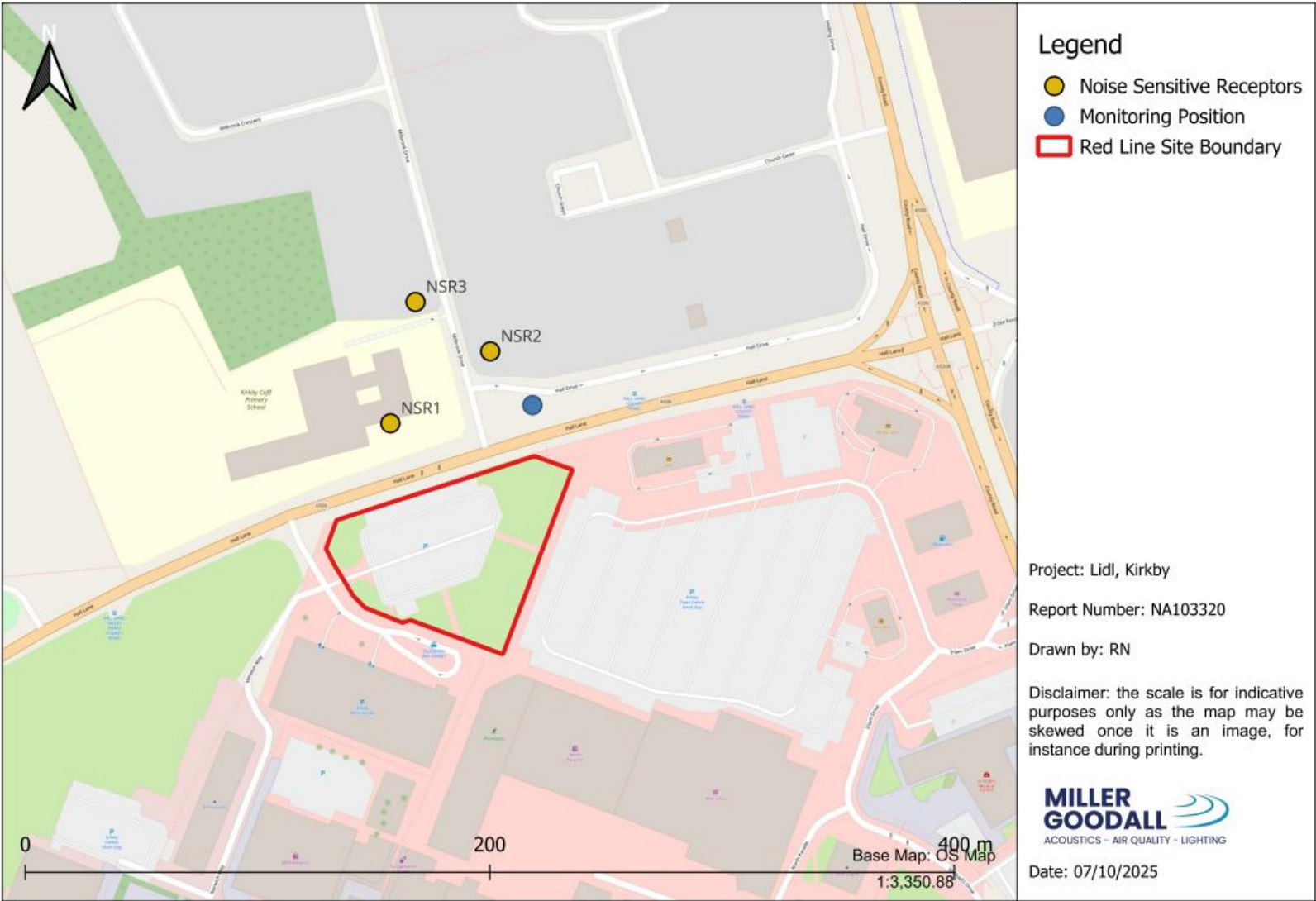
3.3 In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- *Typically, the greater this difference, the greater the magnitude of the 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.*

3.4 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

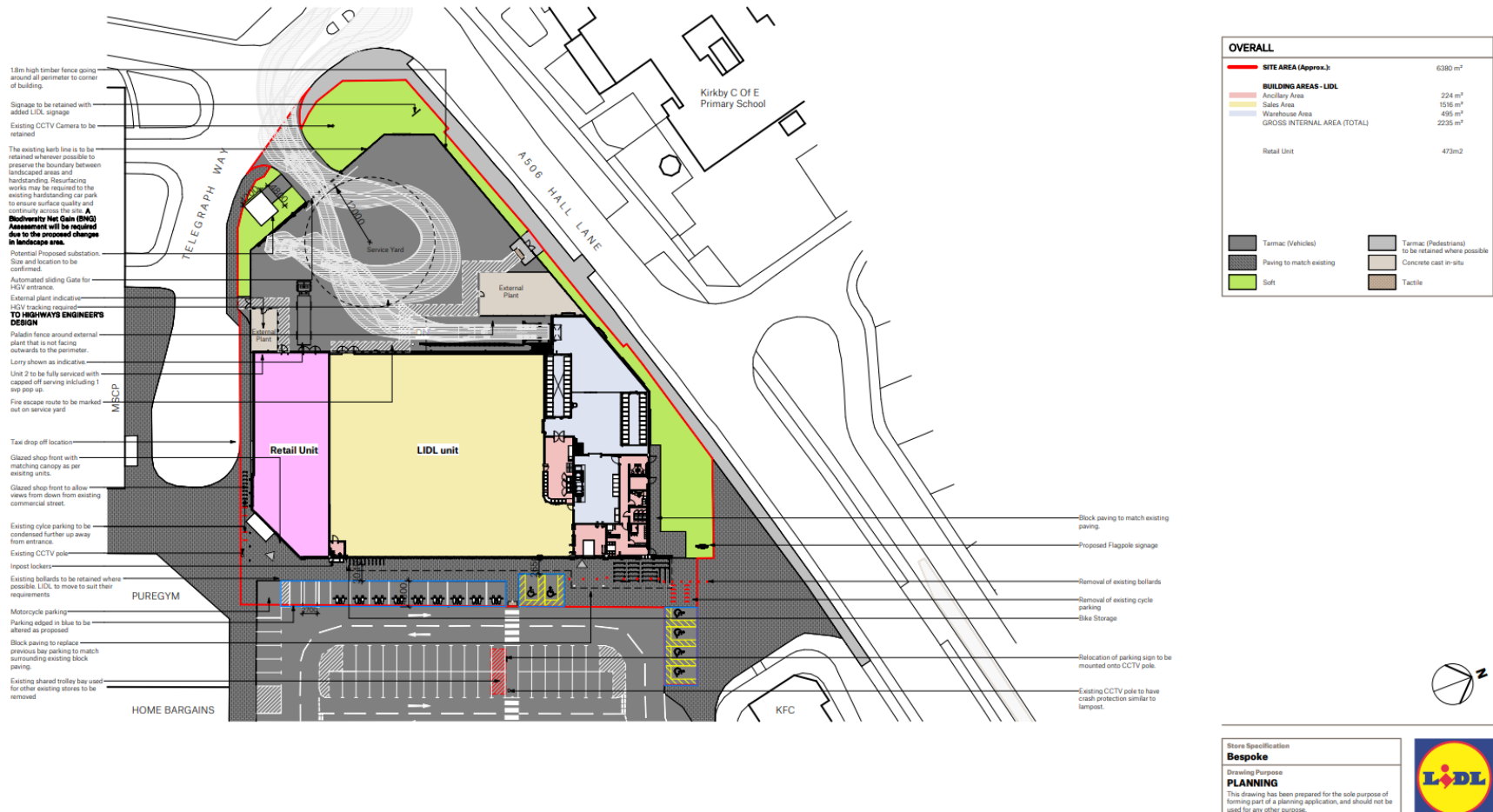
An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

Appendix 2: Site Location, Monitoring and NSR Locations



Appendix 3: Site Layout

Rev.	Author	Checker	Date
P26	MIT	DWW	10.09.25



Appendix 4: Environmental Sound Survey Results

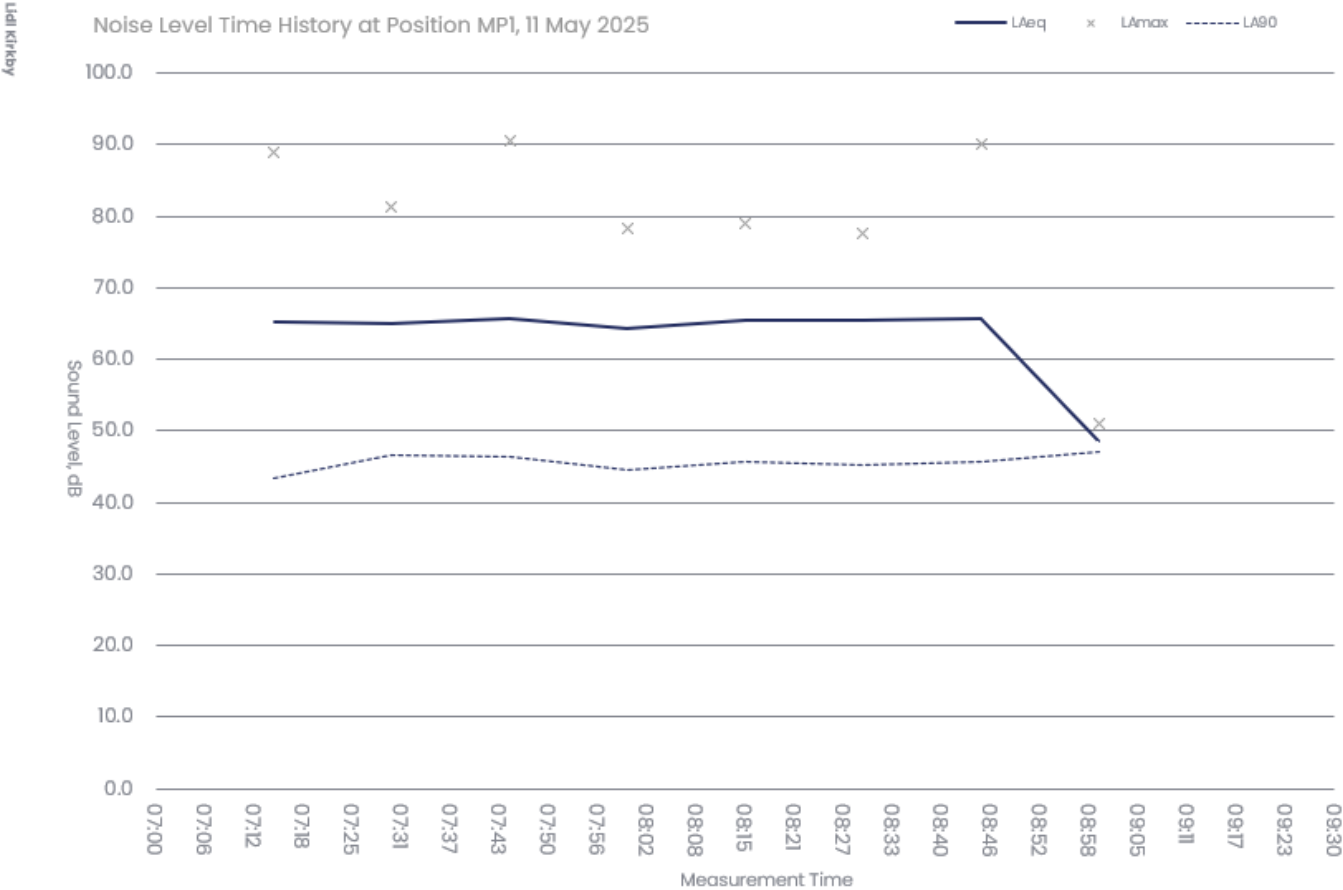


Figure 103320/TH01

Lidl Kirkby

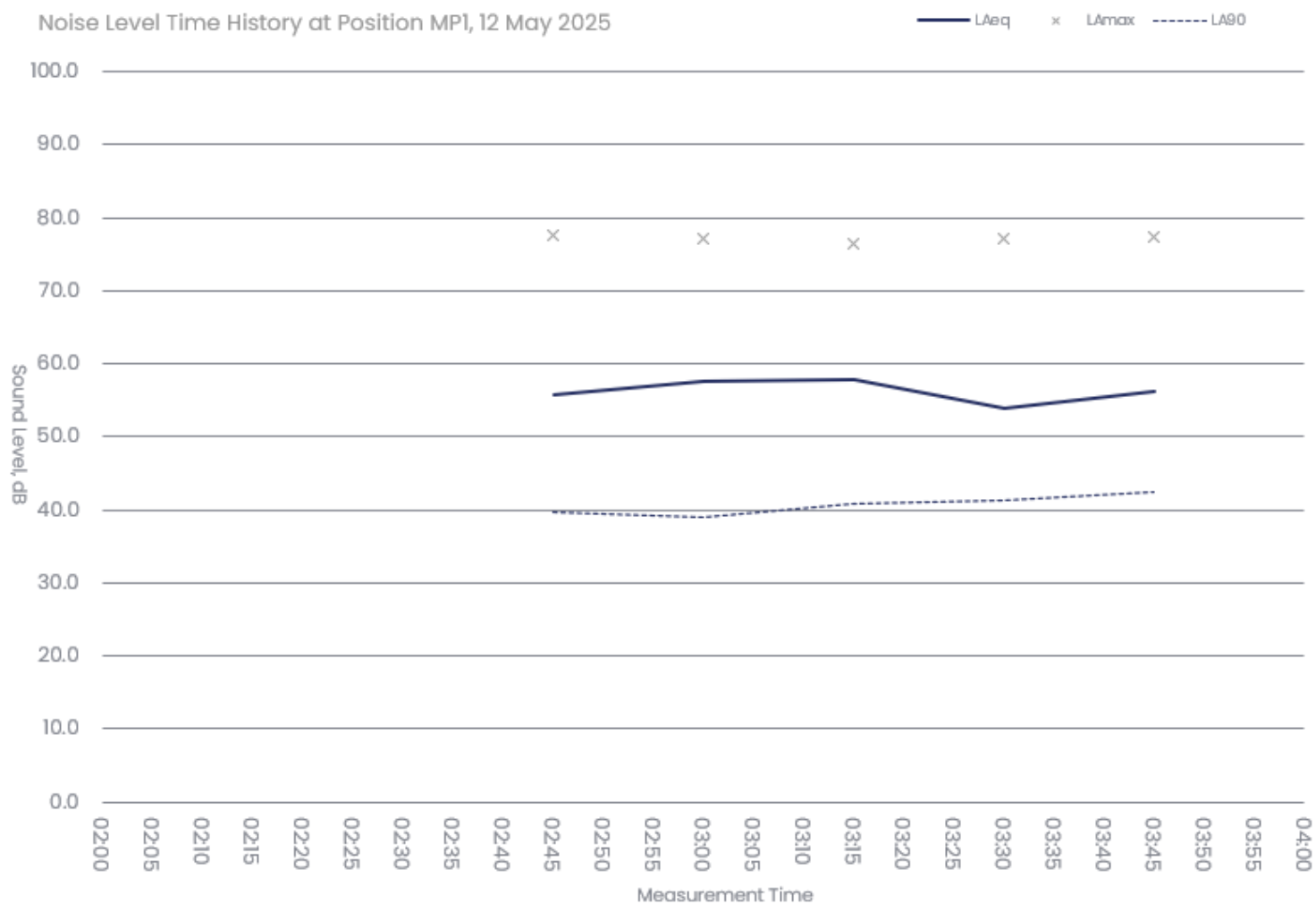
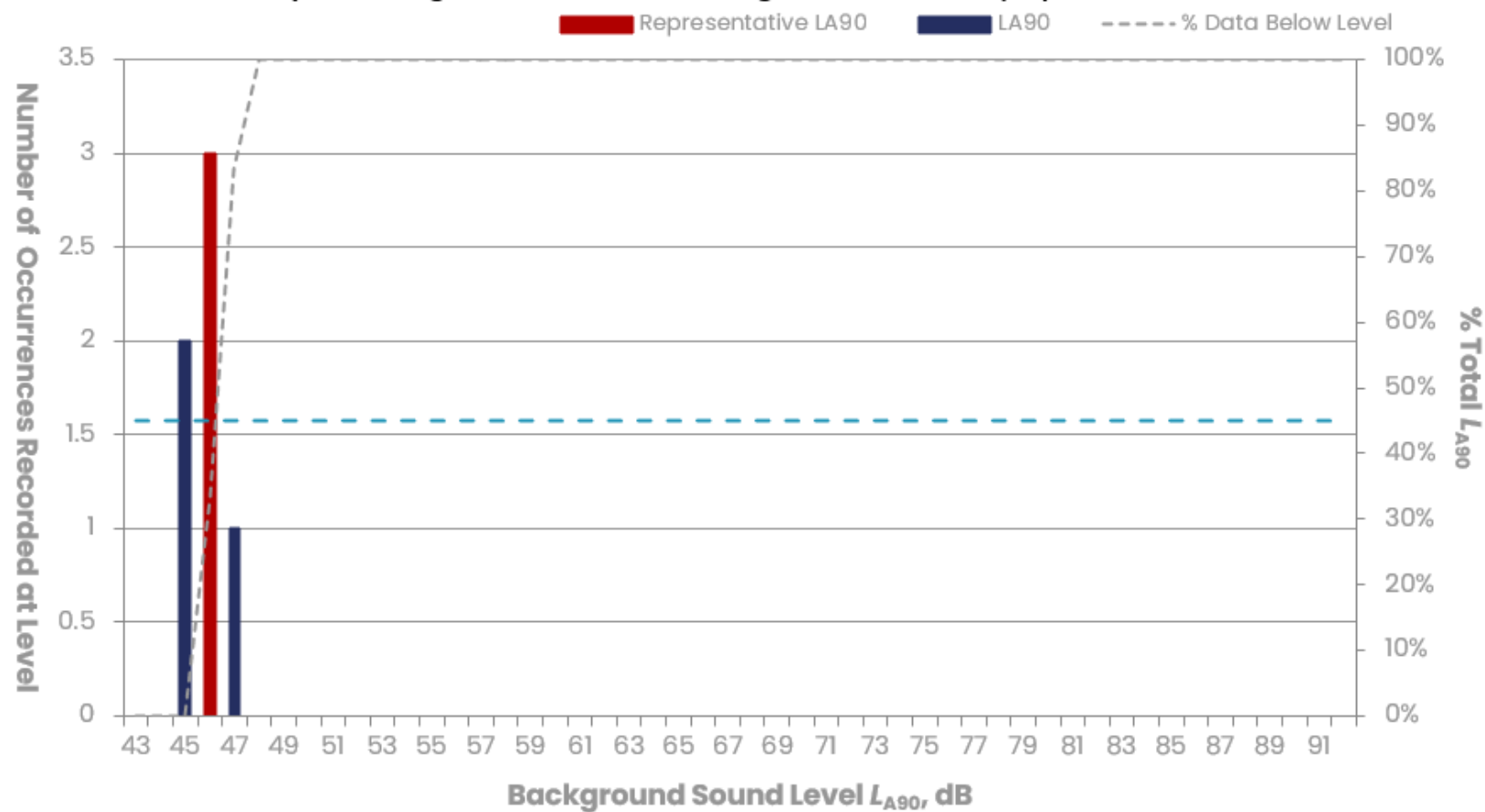


Figure 103320/TH01

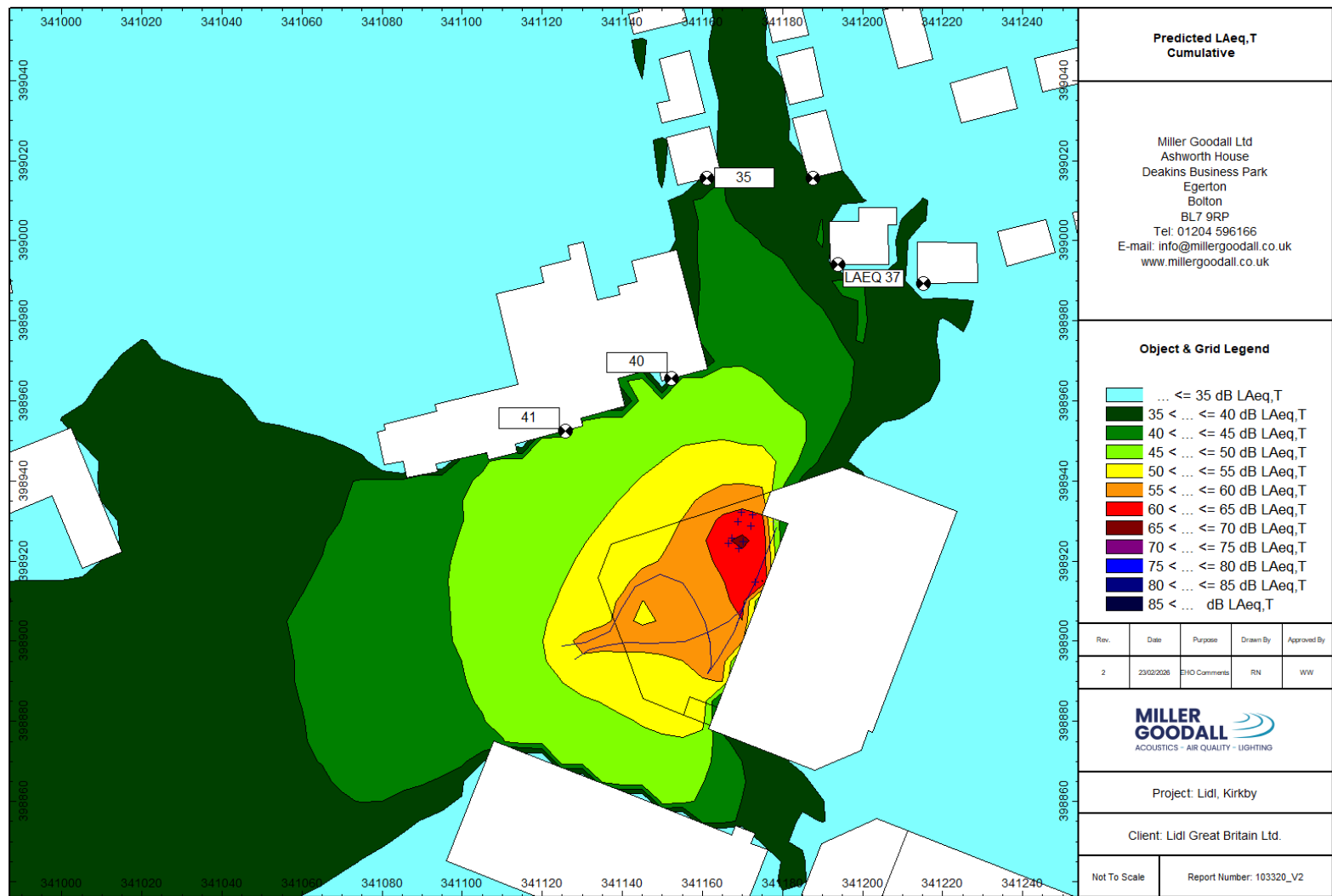
Daytime Background Sound Level Histogram, LA90,15min (dB) 07:00 - 09:00

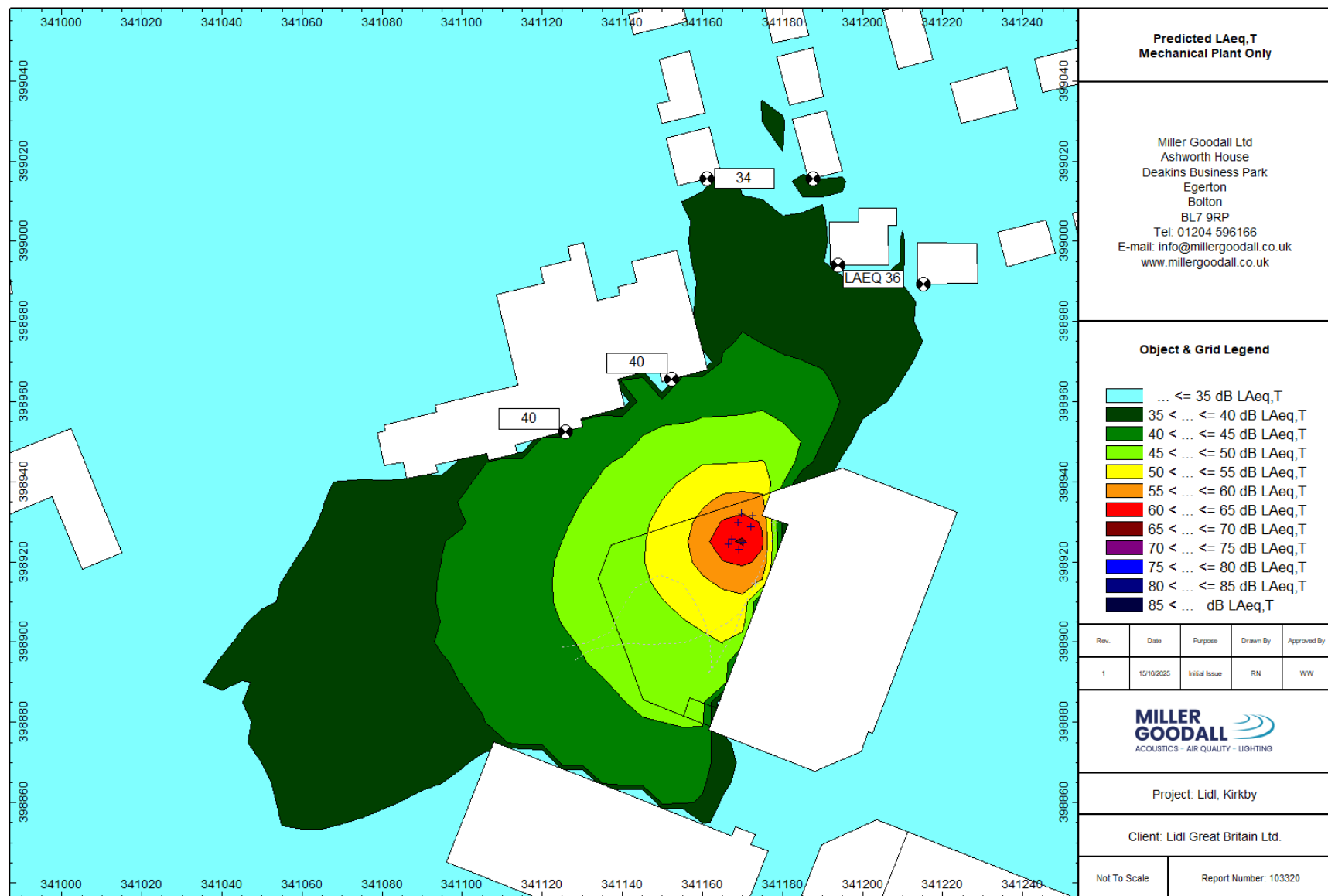


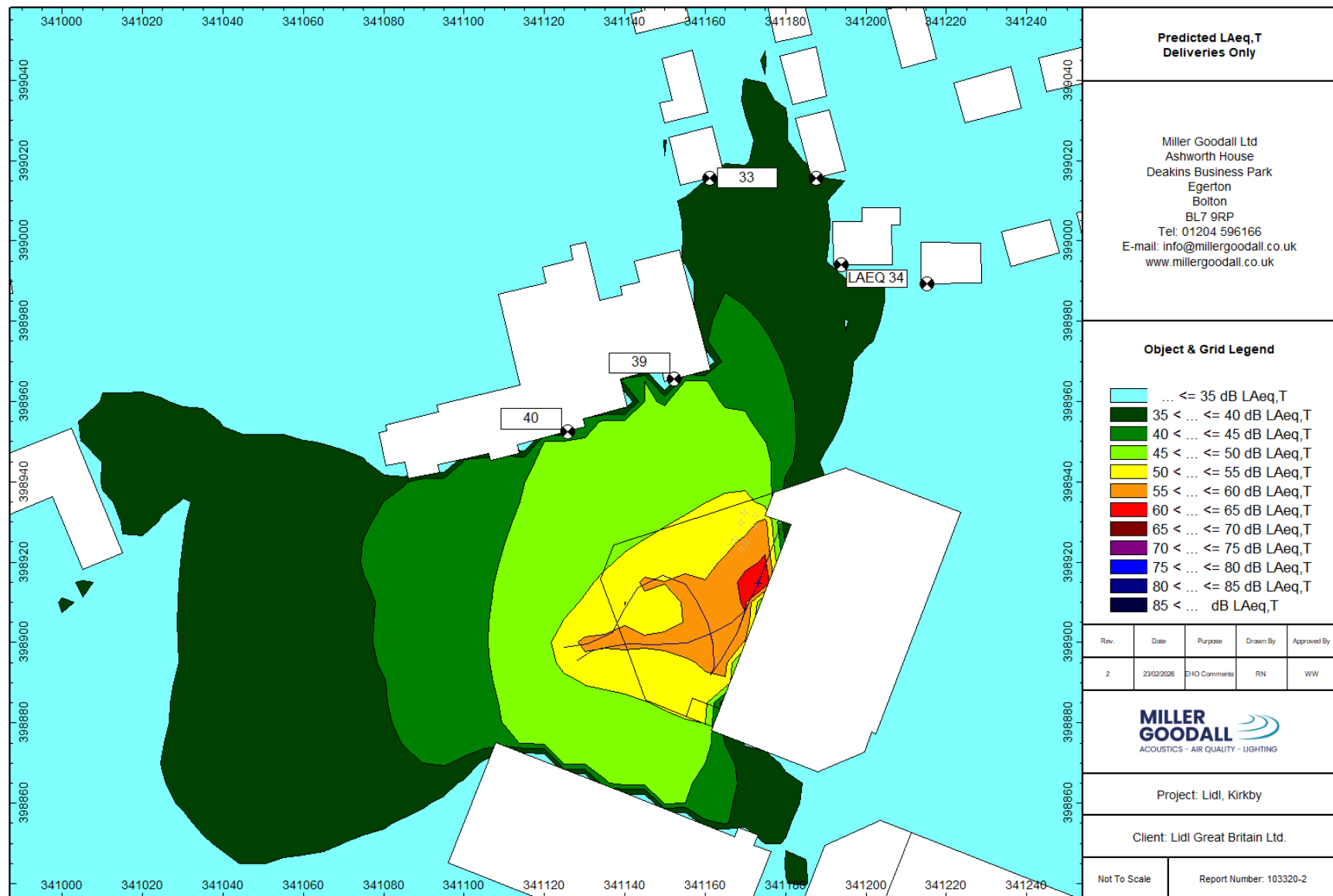
Appendix 5: Noise modelling parameters

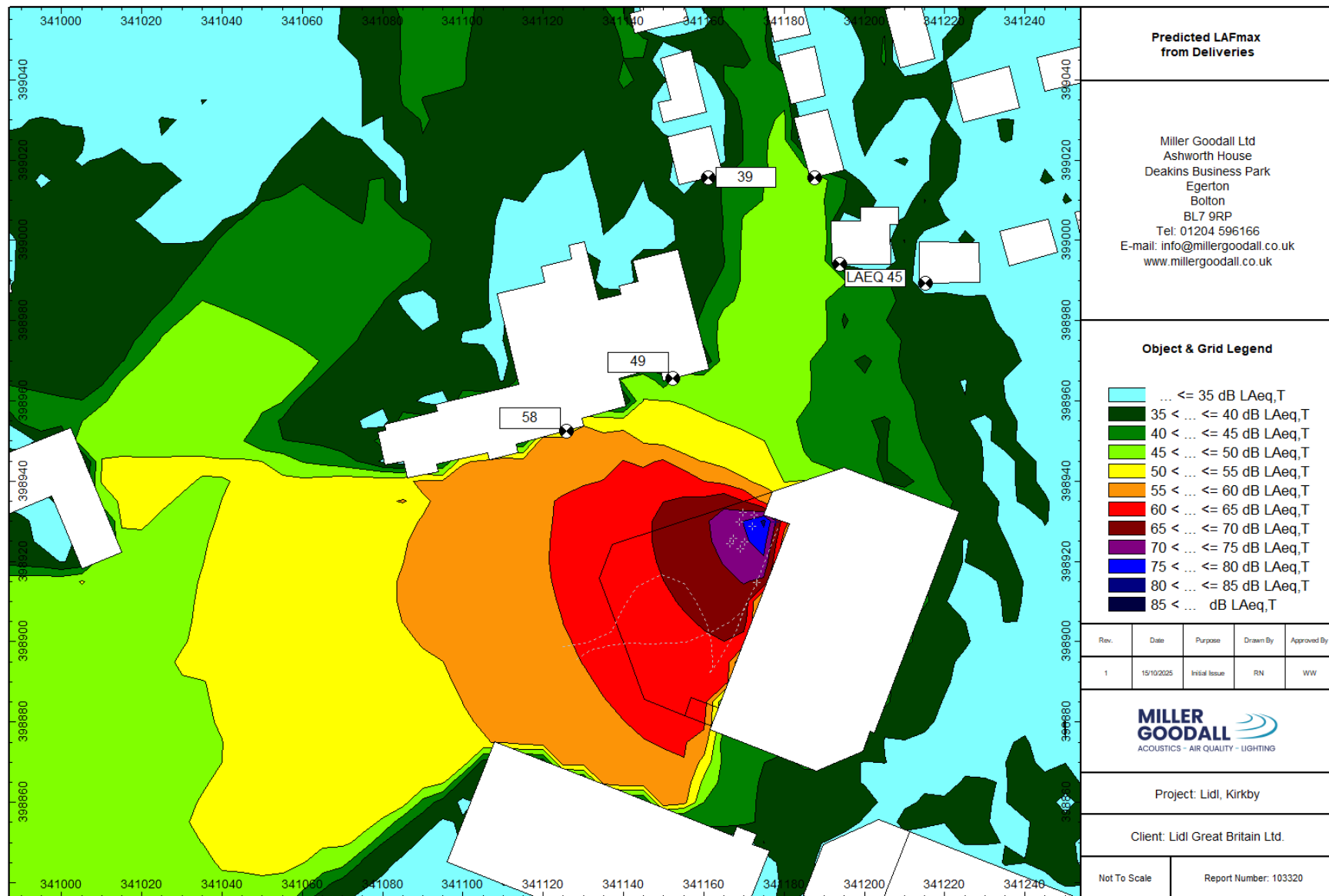
Parameter	Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
HGV Engine Moving, L_w (dB)	95.8	93.4	91.6	95.7	97.5	95.2	90.9	90.2	101.6
HGV Refrigeration Plant, L_w (dB)	111.2	98.2	92.2	91.4	89.1	82.04	76.3	69.0	93.9
HGV Unloading, L_w (dB)	97	90.5	85.1	83.9	87	85.4	80.5	74.3	91.2
Basetec Dry Cooler 100kW, L_w (dB)	75.3	79.3	74.3	69.2	63.2	56.8	50.1	40.6	71.0
Grundfos Pump Station Magna3 D 65-150 F, L_w (dB)	51.6	51.6	49.1	50.6	49.4	47.2	42.4	38.5	54.0
VRV Unit Serving Warehouse, Daikin RXYSQ12TY1, Maximum Capacity, L_w (dB)	11.0	79.0	74.0	75.0	72.0	65.0	63.0	55.0	76.4
VRV Unit Serving Back of House, Daikin RXYSQ4TV9, Maximum Capacity, L_w (dB)	11.0	68	68	66	64	58	54	43	68.2
VRV Unit Serving Sales Area, Daikin RXYLQ12T, Maximum Capacity, L_w (dB)	91	89	80	79	76	71	65	59	81.3
HGV Delivery Unloading L_{AFmax} (dB) input as L_w (dB)	121.4	114.0	107.6	103.6	108.7	108.2	101.6	96.8	113.3

Appendix 6: Noise Model Output









Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is $20 \mu\text{Pa}$, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under laboratory conditions.

dB L_A Decibels measured on a sound level meter incorporating a frequency weighting (A-weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A ; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A .

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014+A1:2019 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

$L_{AF,max}$ The highest A-weighted noise level recorded during the time period using a Fast time-weighting. It is usually used to describe the highest noise level that occurred during the event.

