



NOISE ASSESSMENT

on behalf of

LIDL GB LTD

for the site at

**FALLOWFIELD RETAIL PARK,
MANCHESTER M14 6FS**

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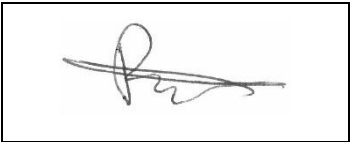
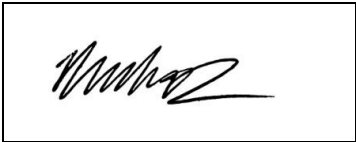
Summary

A noise assessment was undertaken to predict the potential impact of HGV Deliveries and fixed plant for a proposed Lidl store at Fallowfield Retail Park, Manchester M14 6FS. This was prepared to support a full planning application for the development. The development also includes sub-let units, for which the potential noise impact may be addressed at a later date.

Measurements were made at the location of the nearest residential dwellings to the proposed site to identify the pre-development background sound levels. The potential impact of HGV deliveries and fixed plant was predicted within a CadnaA noise model of the site and assessed in accordance with BS 4142:2014+A1:2019. The assessment has also considered HGV delivery and fixed plant noise emissions with respect to Manchester City Council’s criteria and guidance.

The assessment concluded that the impact of fixed plant and deliveries would be low when assessed to BS 4142:2014+A1:2019. Provided delivery noise is managed and mitigated as far as practically possible, the assessment recommends that delivery hours are initially granted from 05:00-00:00 hrs daily.

Record of changes

Prepared By	Reid Malster AMIOA	Reviewed By	Michael Rickard MIOA
Signed		Signed	
Date	7 January 2021	Date	7 January 2021

Version	Date	Change	Initials
1	7 January 2021	Initial Issue	RM
2	13 April 2021	Revised Plant Layout	RM
3	16 April 2021	Reference to sub-let Unit 4	RM
4	3 November 2023	Updated layout	DE
5	11 March 2024	Updated layout	DE
6	27 March 2024	Proposed delivery hours updated	DE

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1 Introduction

- 1.1 Miller Goodall Ltd has, on behalf of Lidl GB Ltd, undertaken a noise assessment in respect of the impact of noise from HGV Deliveries and fixed plant associated with a proposed Lidl store on Fallowfield Retail Park, Manchester.

2 Site Description

- 2.1 The site is located at Fallowfield Retail Park, Manchester M14 6FS. The site location is shown outlined in red in Appendix 1. At present the existing site is occupied by commercial tenants, with plant mounted on the eastern facades of the units, and the on the roof (see Figure 1). Existing deliveries have been observed at the site at 06:00 hrs on a Sunday morning.
- 2.2 The site is located off Birchfield Road, which bounds the site to the west. Semi-detached residential dwellings are located on the opposite side of Birchfield Road, with ground floor and first floor windows facing the retail park.
- 2.3 Directly north of the site Birchfield Primary School is located.
- 2.4 To the south of the site, the B5094 Moseley Road and the A34/A5079 Kingsway, both main routes through the area meet. A few commercial premises are also located to the south of the site.
- 2.5 The site is bounded to the east by a railway line (the Styal Line), a commuter line that links Manchester to Manchester airport. On the opposite side of the railway line residential dwellings are located along Peaceville Road and Kingsmere Avenue, with ground floor and first floor windows. Some properties also have second floor windows. These properties are the closest to the proposed loading bay and plant area.
- 2.6 The railway line is significant within the context of this noise assessment since it is elevated to the site and provides significant screening to the many residential dwellings along Peaceville Road and Kingsmere Avenue (see Figure 1 below).

Figure 1: The existing site



3 Proposed Development

- 3.1 The proposed development consists of a Lidl supermarket and sub-let units, with 103 parking spaces. The existing retail units would be demolished as part of the proposals. The proposed development plans are shown in Appendix 2.
- 3.2 The plans show that the HGV loading area is proposed to be located at the eastern side of the site, between the new Lidl store and the railway line. Dry-Coolers and pumping station plant are proposed to be sited within a rooftop plant area, and outdoor VRF units are proposed to be located at the east side of the store at ground level.
- 3.3 The plans also show a loading area for the sub-let units (Unit 4 and Unit 4A). Noise emissions associated with Unit 4 and Unit 4A are outside the scope of this assessment and may be addressed by the future tenant at a later date.

4 Policy Context

4.1 Noise Policy Statement for England

- 4.1.1 The Noise Policy Statement for England (NPSE¹), published in March 2010, sets out the long-term vision of Government 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.”

- 4.1.2 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.

- 4.1.3 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 of the Statement). 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”.

- 4.1.4 Importantly, the NPSE goes on to state:

¹Noise Policy Statement for England, Defra, March 2010

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

- 4.1.5 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”

- 4.1.6 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.

4.2 National Planning Policy Framework

- 4.2.1 The National Planning Policy Framework (NPPF²) initially published in March 2012, was updated in July 2021. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) “Planning and Noise”³.

- 4.2.2 The revised 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.”

- 4.2.3 At par. 174 we are advised 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.

- 4.2.4 Par. 185 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:

² National Planning Policy Framework, Ministry of Housing, Communities and Local Government, July 2018

³ Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

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.

4.2.5 Par. 187 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.”

4.3 Planning Practice Guidance – Noise

4.3.1 As of March 2014, a Planning Practice Guidance⁴ for noise was issued which provides additional guidance and elaboration on the NPPF. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

4.3.2 In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

“...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation”.

4.3.3 Examples of these factors include:

- The source and absolute noise level of the source along with the time of day that it occurs;
- Where the noise is non-continuous, the number of noise events and pattern of occurrence;
- The frequency content and acoustic characteristics of the noise;
- The effect of noise on wildlife;
- The acoustic environment of external amenity areas provided as an intrinsic part of the overall design;
- The impact of noise from certain commercial developments such as night clubs and pubs where activities are often at their peak during the evening and night.

⁴ Planning Practice Guidance – Noise, <http://planningguidance.planningportal.gov.uk/blog/guidance/noise/>, 06 March 2014

- 4.3.4 The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

"Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed".

- 4.3.5 The PPG was amended in December 2014 to clarify guidance on the potential effect of noise from existing businesses on proposed new residential accommodation. Even if existing noise levels are intermittent (for example, from a live music venue), noise will need to be carefully considered and appropriate mitigation measures employed to control noise at the proposed accommodation.

4.4 Local Planning Policy

- 4.4.1 Manchester City Council's (MCC's) 'Planning and Noise Technical Guidance, October 2022', states the following in '3.7.1.5 Industrial/Commercial Developments':

"BS 4142 should be used to assess the likely impact of noise from industrial and commercial sources at noise sensitive premises (section 3.5). One of the indications of the impact of a BS 4142 assessment is 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.

The council consider that new developments should contribute and enhanced the area in which they are located and where possible i.e. prevent 'noise creep', contribute to the improvement of people's health and quality of life as per the NPSE. With this in mind the design objective should be:

'The development should be designed so as to achieve a rating of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.'

Where this criterion cannot be achieved, the various noise control measures considered as part of the assessment should be fully explained (i.e. relocation of noise sources, use of quieter equipment, enclosures, screening, restriction of the hours of operation) and the achievable noise level should be identified. This information will allow a judgement to be made concerning the application and its likely impact on the surrounding area.

In addition to the above, maximum noise levels should also be adequately controlled. Where particular uses generate high noise levels of a short duration (e.g. loud bangs) on a regular basis, these should aim to be controlled so as not to exceed 60 dB (L_{Amax}) at the façade of noise sensitive premises nearby in accordance with the recommendations of the World Health Organisation (section 3.6).

Deliveries and collections are usually controlled by restricting operational hours but depending on the extent of these activities, a Noise Management Plan (NMP) may be requested, which would include an assessment of noise. This would usually involve assessing the noise upon arrival, loading/unloading period and then departure.

The NMP may also need to include controls such as acoustically sealed delivery bays, and restrictions on vehicle mounted refrigeration units and audible alarm systems. Where applicable, the noise assessment will take account of multiple noise sources operating simultaneously and state the cumulative impact.”

- 4.4.2 The guidance then goes on to explain that noise emissions from fixed plant should also be controlled to a Rating level 5 dB below the Background Sound Level.

5 Acoustic Standards and Guidance

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

- 5.1.1 BS 4142:2014+A1:2019⁵ provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014 and was amended in June 2019. The amended version corrected a number of printing errors and further clarified that the standard is used to assess external noise levels, and not internal noise levels (although this can form part of the discussion regarding context). The key aspects of the Standard are summarised below.
- 5.1.2 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 existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).
- 5.1.3 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.
- 5.1.4 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.*
- 5.1.5 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:

⁵ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

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.

- 5.1.6 The 2014 edition of BS 4142 also introduced a requirement to consider and report the uncertainty in the data and associated calculations and to take reasonably practicable steps to reduce the level of uncertainty.

6 Noise Survey

6.1 Measurements of Existing Noise Sources

- 6.1.1 Noise measurements were undertaken during two separate site visits. The first set of measurements were undertaken on the Sunday morning of 13 December 2020. The second set of measurements were undertaken on the Sunday morning of 14 August 2022.

6.1.2 2020 Survey

- 6.1.3 Noise measurements were undertaken at a location representative of the nearest residential receptors in accordance with BS 7445-1: 2003⁶ by Reid Malster of Miller Goodall Ltd. The calibration of the sound level meter was checked before and after measurements with negligible deviation (<0.1 dB). Details of the equipment used are shown in Table 1, below.

Table 1: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Outdoor microphone housing	NOR 1217	Norsonic	12175146	N/a	N/a
Class 1 ^{7,8} Integrating Real Time 1/3 Octave Sound Analyser	NOR 140	Norsonic	1406017	22/10/19	U33164
Microphone	NOR 1225	Norsonic	358159	22/10/19	33163
Class 1 Calibrator ⁹	Type 4231	Brüel & Kjær	2478249	20/07/20	04743/1

- 6.1.4 Noise monitoring was undertaken at the times specified in Table 2, below. Weather conditions were determined both at the start and on completion of the survey. The measurement location is shown in Appendix 1.

⁶ BS 7445-1: 2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

⁷ IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

⁸ IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

⁹ IEC 60942 (2003) Electroacoustics – Sound calibrators

Table 2: Dates, times and weather conditions during noise measurements

Measurement Locations	Date/Time	Weather conditions		
		Description	At Start of Survey	On Completion
P1	13/12/20, 04:07 - 07:01	Temperature:	3 °C	4 °C
<div> <p>Cloud Cover</p> <p>Symbol Scale in oktas (eighths)</p> <p>0 Sky completely clear</p> <p>1</p> <p>2</p> <p>3</p> <p>4 Sky half cloudy</p> <p>5</p> <p>6</p> <p>7</p> <p>8 Sky completely cloudy</p> <p>(9) Sky obstructed from view</p> </div>		Precipitation:	Dry	Light
		Cloud cover (oktas – see opposite):	5	8
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	Slightly damp roads	Damp roads
		Wind speed:	< 1 m/s	< 1 m/s
		Wind direction:	N/A	
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No

Table 3: Dates, times and weather conditions during noise measurements

Time	Weather conditions
04:00 – 06:05	Overcast, dry, 3°C, still
06:05 – 06:15	Overcast, very light precipitation, 4°C
06:15 – 06:18	Overcast, dry, 4°C, still
06:18 – 07:00	Overcast, precipitation, 4°C

- 6.1.5 The measurement position (MP1) was located at the end of Peaceville Road and is shown in Appendix 1.
- 6.1.6 Measurements were taken during the early hours of a Sunday morning, considered to be when noise from the proposed Lidl store could have the greatest impact. BS 4142:2014+A1:2019 states that for sleep purposes, the beginning and start of the night are potentially of greater importance than the middle of the night. Measurements were made under free-field conditions at a height of 1.5 m above the ground.

- 6.1.7 Precipitation occurred from 06:18 until the end of the survey. Between 06:05-06:15 some minor precipitation occurred (e.g., occasional droplets). As the data from 06:18 onwards was impacted by rainfall it has been omitted from any subsequent analysis.
- 6.1.8 Upon commencement of the survey, noise sources in the area included occasional road traffic noise from the B5093 Moseley Road and the A34/A5079 Kingsway, and plant noise from the retail park (audible at low levels between traffic noise events). Birdsong began from 04:33.
- 6.1.9 The first train pass-by event occurred at 05:30 hrs, and further train pass-by events occurred at 06:11 hrs and 06:30 hrs.
- 6.1.10 At approximately 06:05 hrs a delivery commenced at the retail park. Due to the monitoring location being screened by the railway line it was unclear which unit was being serviced. A loading bay door being opened was audible, followed by the sound of a diesel engine from approximately 06:10-06:15 (it should be noted that engine noise was barely perceptible at the monitoring location). Occasional crashes and bangs were then heard from the retail park throughout the remainder of the survey.
- 6.1.11 Traffic on the local road network gradually increased throughout the duration of the survey, particularly between 06:00-07:00.

6.1.12 2022 Survey

- 6.1.13 A further assessment was undertaken on 14th August 2022, between 03:55 and 07:00 on a Sunday morning. A summary of the broadband measurement data is provided in Table 4 below and is shown graphically in Chart 1. All data are sound pressure levels in dB re 20 μ Pa. T
- 6.1.14 It is worth noting that Background Sound Levels in the area would increase later during the day and during the weekday, due to increases in road traffic noise locally.

6.2 Monitoring Results

- 6.2.1 A summary of the broadband measurement data is provided in Table 4 below and is shown graphically on Chart 1 and Chart 2. All data are sound pressure levels in dB re 20 μ Pa.
- 6.2.2 The results summary shown in Table 4, for 13th December 2020, excludes measurements from 06:18 onwards, due to uncertainty in the measurements due to rainfall. However, it should be noted that between 06:18-07:00 Background Sound Levels in the area would increase under normal conditions due to increases in road traffic noise locally.

Table 4: Summary of noise measurements at MP1 on 13/12/20 and 14/08/2022

Date, Time	Measurement Location	$L_{Aeq,T}$ (dB)	L_{AFmax,T^*} Range (dB)	Mode $L_{AF90,T}$ (dB)
13/12/2020 04:07 – 06:15 hrs	MP1	45	40-71	37
14/08/2022 03:55 – 07:00 hrs	MP1	45	44-79	39

* The time constant T for the $L_{AFmax,T}$ measurements was 1 minute for the measurements undertaken on 13/12/2020 and 5 minutes for the measurements undertaken on 14/08/2022.

- 6.2.3 The 71 dB $L_{AFmax,1min}$ event on 13/12/2020 in Table 4 above was caused by a passing train.
- 6.2.4 The $L_{AFmax,5min}$ events on 14/08/2022 in Table 4 above were either delivery or stock related activity (however no HGV movement was observed) ongoing at the retail park, that was clearly audible and distinctive against the ambient acoustic environment, which continued until approximately 05:00. Prominent bangs and crashes, roller doors, what sounded like metal scraping along the ground, etc were all audible from the retail park between 04:00-05:00.
- 6.2.5 The 1 second noise levels have not been presented in this report but are kept on file for future reference.

Chart 1: Time History of Measured Sound Levels at MP1 on 13/12/20 from 04:07 – 07:01 hrs

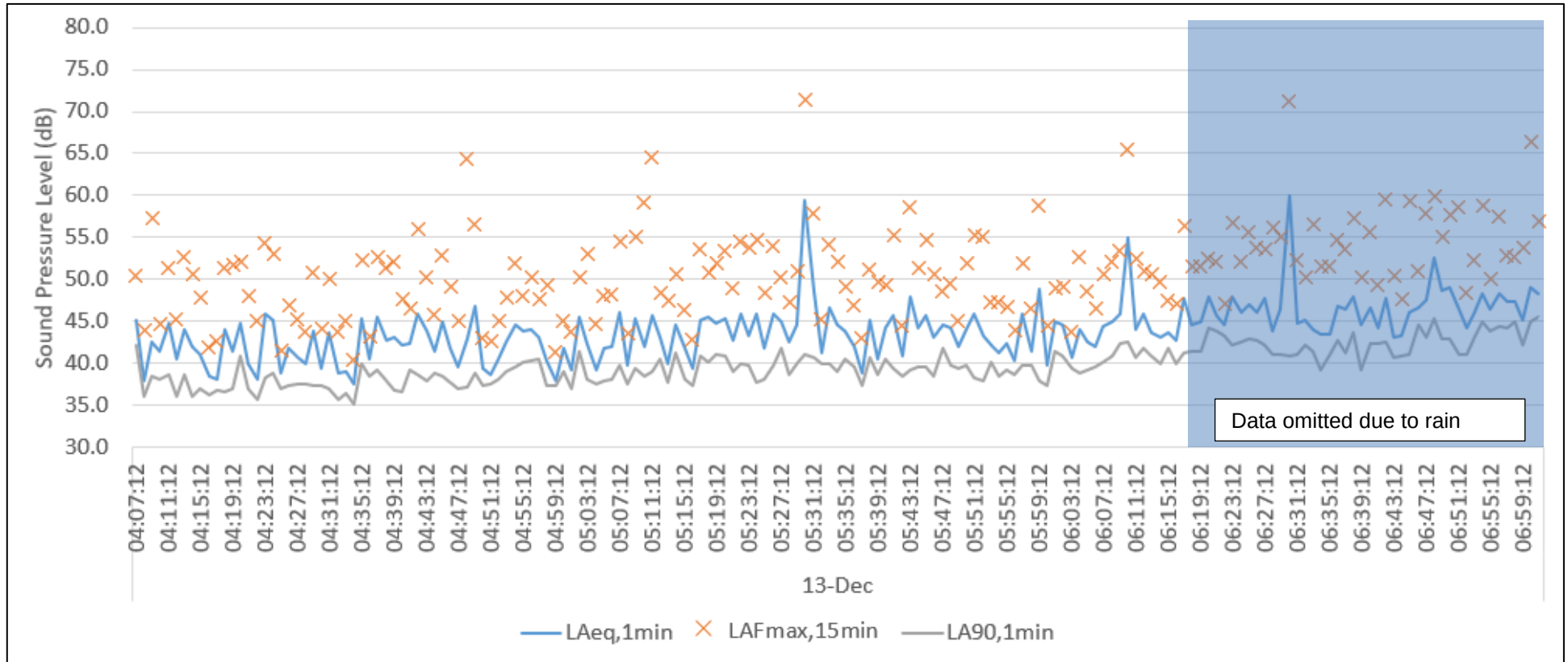
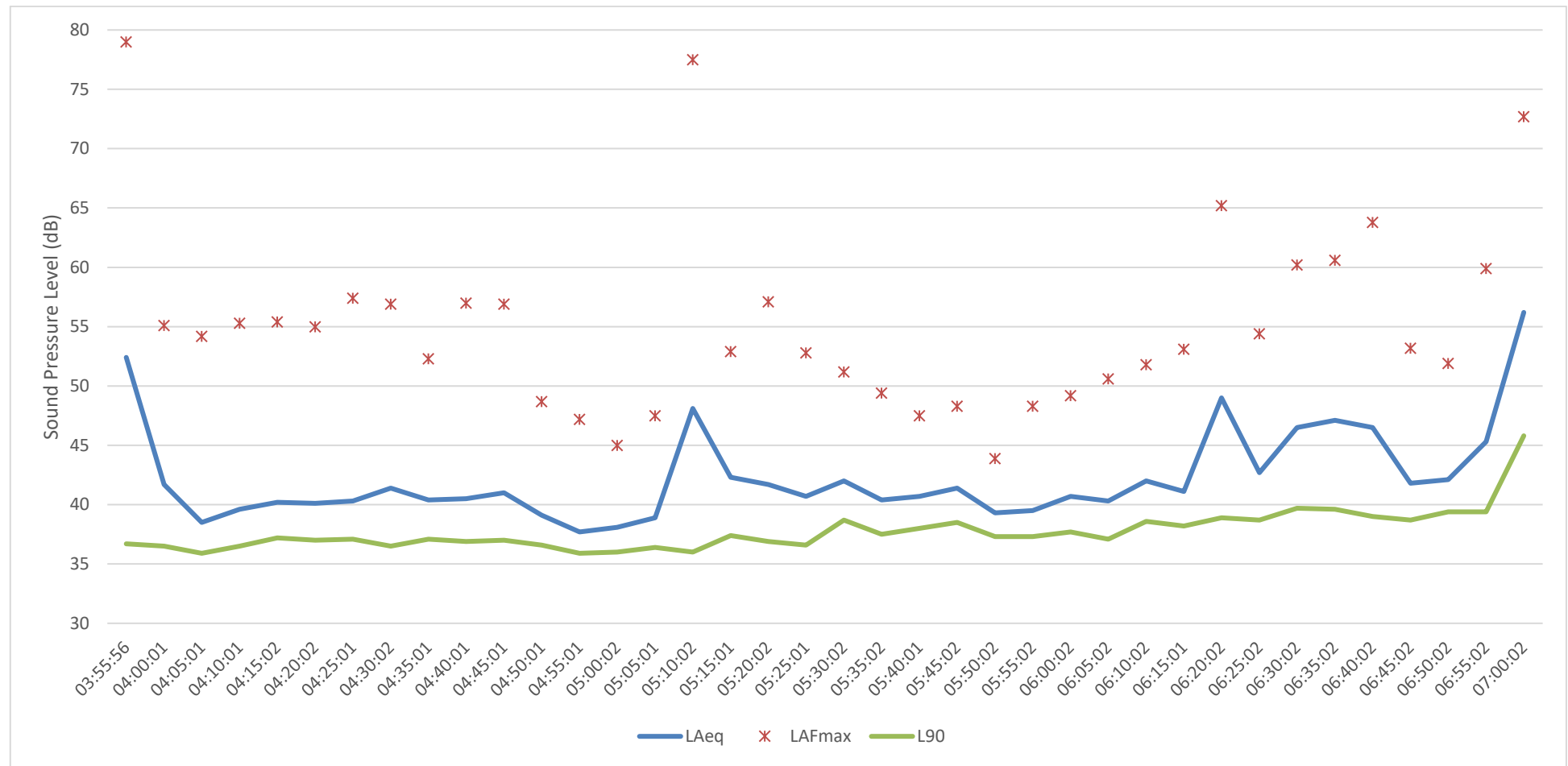


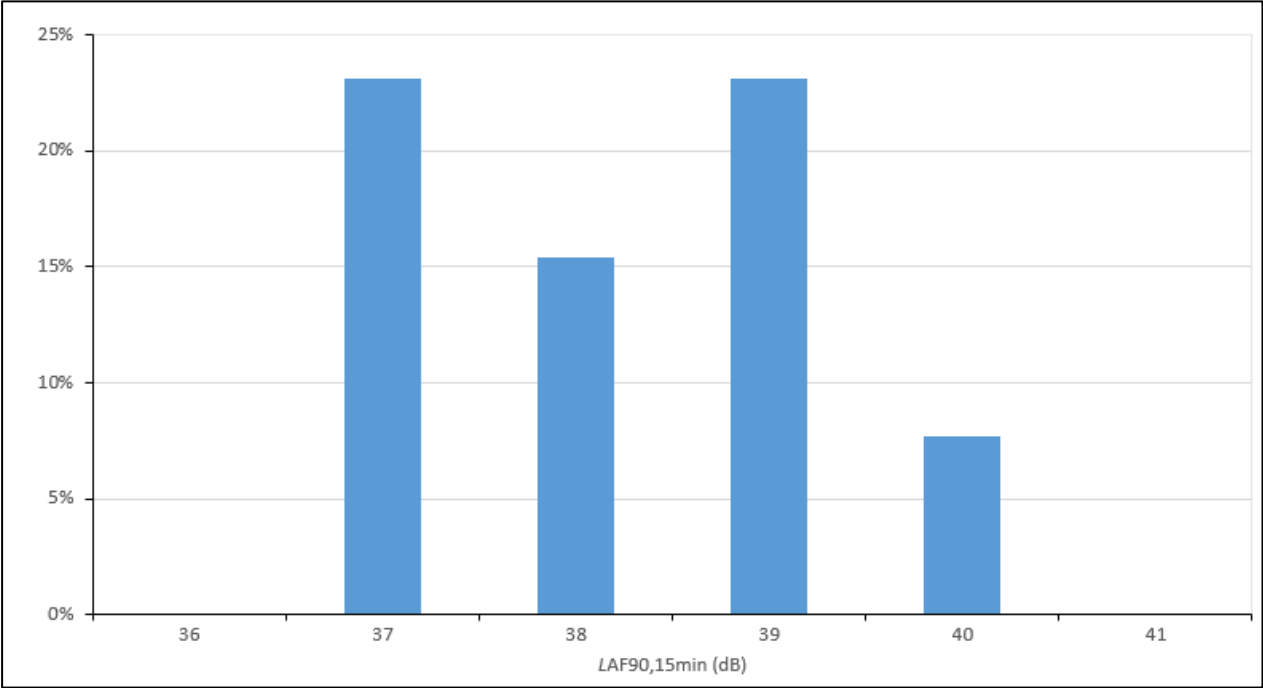
Chart 2: Time History of Measured Sound Levels at MP1 on 14/08/23 from 03:55 – 07:00 hrs

6.3 **Determination of Representative Background Sound Level**

6.3.1 **2020 Survey**

6.3.2 The $L_{AF90,15min}$ data has been analysed in accordance with BS 4142:2014+A1:2019 to determine a representative Background Sound Level during the noise monitoring.

Chart 3: Statistical Analysis of $L_{AF90,15min}$ Background Sound Levels on 13/12/20 04:00 – 06:15 hrs



6.3.3 Chart 3 above shows that the typical measured Background Sound Level for the duration of the survey was between 37-39 dB $L_{AF90,15min}$.

6.3.4 2022 Survey

6.3.5 $L_{AF90,5min}$ data has been analysed in accordance with BS 4142:2014+A1:2019 to determine a representative Background Sound Level during the noise monitoring. The modal L_{A90} value was 39 dB. This value is in line with the 2020 survey, which was L_{A90} 37 – 39 dB.

6.3.6 It is considered that the 39 dB modal L_{A90} value is more likely to be representative of typical conditions, since the 2020 survey was undertaken during Teir 3 Covid restrictions. The modal daytime L_{A90} would likely be higher than 39 dB by some margin.

6.3.7 Proposed Background Sound Levels

6.3.8 Table 5 presents the proposed background sound levels that have been used for the BS 4142 assessment.

Table 5: Representative Background Sound Levels

Assessment Period		Representative Background Sound Level, $L_{A90,T}$ (dB)
Daytime	07:00 hrs to 23:00 hrs	39
Night-time	23:00 hrs to 07:00 hrs	37

6.3.9 For the purposes of this assessment 39 dB $L_{AF90,15min}$ will be used as the representative background sound level for the daytime period, and 37 dB $L_{AF90,5min}$ will be used as the representative background sound level for the night-time period.

6.3.10 However, careful consideration should be given to the fact that the monitoring period represents one of the quietest and most sensitive times of the week. Weekday mornings for example, will have higher background sound levels.

6.3.11 It should also be noted that the 2020 survey was also undertaken during Tier 3 restrictions in relation to the Covid-19 pandemic. Under representative conditions road traffic levels are usually low during the early hours of a Sunday morning, and the monitoring period conditions are therefore likely to have been impacted to a lesser degree than other periods during the week. It should also be noted that in this case, the impact of Tier 3 restrictions is likely to result in lower background sound levels rather than higher background sound levels.

6.3.12 The proposed representative background sound levels are therefore considered to represent a worst-case assessment.

7 Impact of Noise from the Proposed Development

7.1 Noise Modelling

7.1.1 Prediction of noise levels at sensitive receptors was carried out using CadnaA software package. The data from measurements taken was used to populate an environmental noise model.

7.1.2 The general horizontal plan information of the area surrounding and including the proposed development site was imported from Google Maps. This was used to determine road positions, building footprint areas and relative locations and is considered accurate to within 5%. Building height information was based on site observations and Digital Surface Model (DSM) survey data obtained through Google Earth. Topography was modelled with Digital Terrain Model (DTM) Lidar Survey data obtained from DEFRA to ensure that the screening effects of the railway line were modelled as accurately as possible.

7.1.3 The following parameters were assigned to the model:

- Propagation model: ISO 9613¹⁰
- Default ground absorption: 0.1 (acoustically reflecting)
- Two orders of reflection
- Buildings are reflecting (smooth, non-structured facade)

7.2 Noise Sensitive Receptor and Prediction Heights

7.2.1 The nearest noise sensitive dwellings to the site are located on Birchfields Road, Kingsway and Peaceville Road.

7.2.2 The most affected Noise Sensitive Receptor (NSR) has been determined to be 6 Peaceville Road with respect to fixed plant noise and 138 Birchfields Road with respect to the cumulative impact of HGV delivery and fixed plant noise. The locations of the most affected NSRs are indicated on the figure in Appendix 1.

7.2.3 Noise level grids are presented in Appendix 3 and are calculated at a height of 1.5 m above ground level for daytime assessments and 4 m above ground level for night-time assessments.

7.2.4 The noise levels at the noise sensitive dwellings are annotated on the noise grids in Appendix 3. The annotations at the most affected NSRs, correspond to heights of 1.5 m above ground level for the daytime period, and 4m above ground level for the night-time period, to represent ground floor and first floor receptors respectively. For other NSRs, all annotations are at a height of 4 m above ground level, for comparative purposes.

7.3 Modelling of HGV Delivery Noise

7.3.1 The operation of the whole delivery process is undertaken by one person which reduces the requirement for talking and shouting and all goods and waste are moved in sealed containers.

7.3.2 The process takes approximately 40 minutes including the entry of the delivery vehicle into the yard, opening the rear container doors, reversing onto the ramp (reverse alarms restricted as necessary within the site noise management plan), unloading the stock, loading waste to be removed and finally leaving the site.

7.3.3 The loading bay allows goods to be moved internally within the wagon, directly into the Lidl store. The moving of goods is therefore effectively an internal process.

¹⁰ ISO 9613-2: 1996 Acoustics - Attenuation of sound during propagation outdoors – Part 2: General method of calculation

- 7.3.4 Octave band data for a typical delivery is shown below in Table 6. This data, measured at 2.0m from the mid-point of the wagon when parked (16.5 m articulated vehicle), shows the measured noise level at a Lidl store in Colne, Lancashire during a delivery adjusted to take account of the contributions from residual sound at the monitoring location due to other noise sources not associated with the LIDL store. This data was measured without refrigeration plant operating on the HGV.
- 7.3.5 The refrigeration plant on the HGV is located near the driver's cab. This has therefore been measured separately for the purposes of calibrating the refrigeration plant as a point source within the noise model.
- 7.3.6 Table 6 below shows octave band and single figure values for the entire measurement. The calibrated L_w sound power levels for a 15.0 m line source, represents the delivery wagon in the noise modelling and is positioned at 2.0 m above ground level.
- 7.3.7 L_w Sound Power Levels derived from source measurements of the refrigeration plant are also shown in Table 6. This is modelled as a point source within the model.
- 7.3.8 It is understood that there will be one delivery per day at the proposed store.

Table 6: Octave Band Noise Data of a Lidl Delivery

Noise Source	Sound Level, dB, at Octave Band Centre Frequency (Hz)								dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	8.0 kHz	
Measured Noise Levels (dB) at 2 m									
Total Delivery ($L_{eq,T}$)	63.9	64.6	61.3	61.6	61.3	59.9	59.7	58.3	67.2
Calibrated Model Noise Sources (dB) (L_w 15m line source)									
Total Delivery	76.6	77.2	73.9	74.3	74	72.6	72.5	71.5	80.0
Derived L_w Sound Power Level (dB) of Refrigeration Plant									
Refrigeration Plant	80.2	69.2	66.1	74.4	70.9	72.1	71.3	61.2	78.2

7.4 Modelling of Plant Noise

- 7.4.1 Octave band noise data for the proposed plant was not available. Therefore, to assist in this assessment measured spectra of similar VRF's and Dry Coolers obtained by Miller Goodall at other Lidl sites were adjusted to match the broadband manufacturers data for use in the model resulting in the following data shown in Table 7. Precise fit-outs are determined during the final design stages of the project, but for a store of this type plant compliment would typically contain:

- 2 no. 45.0 kW Variable Refrigerant Flow (VRF) units
- 1 no. 28.0 kW Variable Refrigerant Flow (VRF) unit
- 2 no. 100 kW Dry Coolers
- 2 no. Pumping Stations

Table 7: Noise source data used within CadnaA

Description	Sound Power Level, L_w dB in Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
45.0 kW VRF	84.8	82.8	75.8	74.8	74.8	70.8	66.8	59.8	78.9
28.0 kW VRF	79.8	77.8	70.8	69.8	69.8	65.8	61.8	54.8	73.9
100 kW Dry Cooler	75.3	79.3	74.3	69.2	63.2	56.8	50.1	40.6	71.0
Pumping Station	N/A	65.2	62.7	64.2	63.0	60.8	56.0	52.1	67.6

7.4.2 For this site, it is understood that the current proposals locate the dry coolers and pumping stations on a roof plant deck adjacent to the western store façade, and locate the VRF units at ground level adjacent to the eastern store façade. The dry-cooler's and pumping stations have been modelled within a rooftop plant area and the VRF's have been modelled at ground level, to reflect the proposed locations. The proposed location of the fixed plant is indicated on the figure in Appendix 2.

7.4.3 Each item of plant was modelled as a separate point source. The VRF and dry cooler units, which have fans pointing vertically were modelled with vertical directivity, as opposed to an omni-directional source. Each item of plant was assumed to be 1.2 m above the ground or roof level at its location.

7.4.4 The plant is in constant operation throughout the day and the night. The dry-coolers operate intermittently, cycling on and off for a few minutes at a time according to load requirements.

7.5 Modelling of Baseline Mitigation

7.5.1 At the time of issuing this report, baseline noise mitigation is indicated in the proposals by the inclusion of an acoustic fence on SMR Architects External Works drawing reference 7397-SMR-00-ZZ-DR-A-2004-A3, Revision C4.

7.5.2 An acoustic fence has been proposed adjacent to the eastern edge of the loading bay. In the CadnaA computer noise model the acoustic fence has been modelled to be 3.5 m in height and is modelled to extend 2 m northwards of the position indicated on the SMR Architects External Works drawing referenced above. The extent of the proposed fence is indicated on the figure in Appendix 2 and is assumed to be included in the baseline mitigation for the purpose of this assessment.

7.5.3 In addition, it is understood that the western side of the proposed plant deck will be screened by curtain walling, forming the façade to the west facing storefront. This has been modelled as a barrier within the CadnaA computer noise model.

7.5.4 The location of the baseline noise mitigation is indicated on the figure in Appendix 2.

7.6 Noise Model Results

7.6.1 Full noise model results and grids are presented in Appendix 3.

7.6.2 The specific noise level resulting from plant noise within the model is 23 dB $L_{Aeq,T}$ at the most affected NSR at a ground floor receptor during the daytime period, and 26 dB at a first floor receptor during the night-time period.

- 7.6.3 The Specific Noise Level resulting from the cumulative contributions of plant and HGV delivery noise was 33 dB $L_{Aeq,1hour}$ for the daytime period and 35 dB $L_{Aeq,15min}$ for the night-time period, at the most affected NSR.
- 7.6.4 The noise modelling results indicate that noise levels associated with operations at the proposed site are likely to be higher at 6 Peaceville Road with respect to fixed plant noise, and 138 Birchfields Road with respect to the cumulative impact of HGV delivery and fixed plant noise, than other nearby noise sensitive dwellings. As such 6 Peaceville Road is considered to be the most affected NSR for the purpose of the assessment of fixed plant noise, and 138 Birchfields Road is considered to be the most affected NSR with respect to the cumulative impact of HGV delivery and fixed plant noise.
- 7.6.5 Although the majority of properties to the east of the site are screened by the railway embankment, there is an opening where the railway line runs over a bridge at the end of Peaceville Road. The unscreened area of the railway line is indicated in Figure 2.
- 7.6.6 The computer noise modelling indicates that the additional screening provided by the acoustic fence adjacent to the loading bay is likely to reduce noise levels at the most affected NSR by approximately 10 dB.

Figure 2: Screening Provided by Railway Line



7.7 BS 4142:2014+A1:2019 Assessment

- 7.7.1 Two BS 4142 noise impact assessments has been undertaken in order to assess the potential noise impact at the most affected NSR and are detailed in this section of the report.

7.7.2 Fixed Plant Assessment

- 7.7.3 Based on the above assumptions, the BS 4142 numerical assessment of noise impact at the most affected NSR, due to the likely fixed plant noise emissions from the proposed development is presented in Table 8 below. Considering the intermittency of the dry coolers in the context of the difference between the specific sound level and the background sound level, the specific sound level is greater than 10 dB below the background sound level. In this case the intermittency would not be perceivable at the receptor and as such no acoustic feature correction has been applied to the numerical assessment.

Table 8: BS 4142:2014+A1:2019 Plant Noise

Assessment Period	Receptor Location	Specific Noise Level ($L_{Aeq,15min}$ dB)	Acoustic Feature Correction (dB)	Rating Level (dB)	Background Sound Level ($L_{AF90,T}$ dB)	Excess of Rating Level over Background Sound Level (dB)	Initial Estimate of Impact
Daytime (07:00-23:00)	6 Peaceville Road Ground Floor	23	0	23	39	- 16	Indication of low Impact
Night-time (23:00-07:00)	6 Peaceville Road First Floor	26	0	26	37	- 11	Indication of low impact

7.7.4 It can be seen from Table 8 above that the initial BS 4142 numerical assessment of the impact of noise from fixed plant, indicates a likelihood of low impact at the most affected NSR during both the daytime and the night-time period.

7.7.5 The assessment indicates that noise from fixed plant associated with the proposed development is likely to meet MCC's requirements as set out in the 'Planning and Noise Technical Guidance, October 2022' as outlined in Section 4.4.

7.7.6 Cumulative Assessment

7.7.7 The BS 4142 numerical assessment of noise impact at the most affected NSR, due to the likely cumulative contributions of HGV delivery noise and fixed plant noise emissions associated with the proposed development is presented in Table 9 below. A 3 dB acoustic feature correction has been applied for impulsivity. The correction has been applied because, as explained in Section 6.3, the HGV backs up directly to the loading bay, allowing the goods to be moved directly into the store from the back of the wagon. Impulsive characteristics caused by the unloading of goods is effectively an internal process and would therefore not be as perceptible at the receptors, as for example, a delivery where the goods exited the HGV via a tail-lift and were rolled externally into the store.

Table 9: BS 4142:2014+A1:2019 Cumulative Impact of Plant and HGV Delivery noise

Assessment Period	Receptor Location	Specific Noise Level ($L_{Aeq,15min}$ dB)	Acoustic Feature Correction (dB)	Rating Level (dB)	Background Sound Level ($L_{AF90,T}$ dB)	Excess of Rating Level over Background Sound Level (dB)	Initial Estimate of Impact
Daytime (07:00-23:00)	138 Birchfields Road Ground Floor	33	+ 3 (Impulsivity)	36	39	-3	Indication of low Impact
Night-time (23:00-07:00)	138 Birchfields Road First Floor	35	+ 3 (Impulsivity)	38	37	+1	Indication of low impact

7.7.8 It can be seen from Table 6 above that the initial BS 4142 numerical assessment of the cumulative impact of noise from HGV delivery events and fixed plant, indicates a likelihood of low impact at the most affected NSR during both the daytime and the night-time period.

7.8 Context and Summary of Assessment

7.8.1 The assessments in Section 7.7 detail the results of the initial numerical assessment of sound levels at the most affected NSR. It is important to note that the numerical assessment of impact is influenced by the context of the proposals including the surrounding environment and the operating characteristics.

7.8.2 Plant Noise Impact

7.8.3 The initial numerical estimate of impact based on the excess of the rating level over the background sound level indicates that the impact of plant noise would be low, during what is expected to be one of the most sensitive periods of the week. For most of the week, background sound levels are likely to be higher.

7.8.4 The results indicate that plant noise emission levels would meet the MCC's criterion of a rating level 5 dB below the background sound level at one of the most sensitive times of the week.

7.8.5 It is also noted that plant noise from the existing units forms part of the existing ambient acoustic environment and therefore part of the background sound level. This differentiates the situation from one where a new type of noise source is introduced, and is further indication of a likelihood of low impact. Miller Goodall Limited are unaware of any complaints from residents about the existing low level background plant noise in the vicinity the site.

- 7.8.6 Considering both the numerical assessment and the context of the site, fixed plant noise emissions are likely to be of low impact. As such, fixed plant noise emissions associated with the proposed development should be considered acceptable to MCC.

7.8.7 Cumulative Noise Impact

- 7.8.8 The initial BS 4142 numerical assessment of the cumulative impact of noise from HGV delivery events and fixed plant, indicates a likelihood of low impact at the most affected NSR during both the daytime and the night-time period.
- 7.8.9 The numerical assessment indicates the cumulative noise from HGV delivery events and fixed plant associated with the proposed development is unlikely to meet MCC's criteria, based on the proposed background sound levels. However, the background sound levels are measured in the vicinity of 6 Peaceville Road, which benefits from significant screening from road traffic noise sources, in comparison to 138 Birchfields Road.
- 7.8.10 Background sound levels at Birchfields Road are likely to be significantly higher than background sound levels at Peaceville Road, such that the numerical assessment presented in Table 9 is more onerous. An increase in background sound level of 2 dB during the daytime period would result in the numerical assessment meeting MCC's criteria during the daytime.
- 7.8.11 The night-time assessment has been based on background sound levels recorded on a Sunday morning during Tier 3 Covid restrictions, as detailed in Section 6.3. This is likely to be one of the quietest periods of the week and is likely to have been quieter due to the restrictions. During typical mornings, the Local Authority's criteria may be achieved.
- 7.8.12 Considering the context of the existing acoustic environment, it should also be noted that delivery activities were observed just after 06:00 hrs on Sunday morning during the noise survey undertaken in December 2020, and between 04:00 and 05:00 hrs on Sunday morning during the noise survey undertaken in August 2022, as detailed in Section 6.1. Miller Goodall Limited are not aware of any complaints to date in relation to existing deliveries at the site. This is an indication that the existing acoustic environment would not be impacted significantly due to deliveries associated with the proposed development, that were undertaken during similar hours of the night-time period.
- 7.8.13 It should be recognised that the delivery process incorporates a number of control and noise management measures, as described in Section 7.2. In addition, a Noise Management Plan (NMP) has been produced by Miller Goodall Limited on behalf of Lidl GB Ltd, dated August 2022 (Report ref: 102452-3).

7.8.14 Proposed Delivery Hours

- 7.8.15 It is understood that planning condition No. 10 associated with the previously approved application states that:

'Deliveries, servicing and collections, including waste collections shall not take place outside of the following hours: 07.30 to 20.00 hrs Monday to Saturday; No deliveries/waste collections on Sundays and Bank Holidays'.

7.8.16 In a previous report by Miller Goodall Limited (ref: 102452_V3), it was recommended that delivery hours are initially granted from 05:00-00:00 hrs daily. Based on this, the applicant submitted a variation of condition application and subsequently an appeal (ref: APP/B4215/W/23/3322495) seeking a variation of condition No. 10, to allow deliveries from 05:00 to 00:00 Monday to Sunday, including Bank Holidays.

7.8.17 It is understood that the Planning Inspectorate have recently dismissed the appeal. The appeal decision has been reviewed and the inspector's concerns have been considered. Based on the context provided in the previous section, and comments provided in a previous letter by Miller Goodall Limited (ref: 102452-5) which was submitted with the applicant's appeal, it is considered, as a maintained opinion, that the additional delivery hours would not cause unacceptable impacts.

7.8.18 However, the inspector's concerns regarding disturbance from deliveries during the quietest periods, have been considered. It is therefore recommended that delivery hours should be granted during daytime hours only. On this basis, it is proposed that a condition in relation to delivery hours could read:

'Deliveries, servicing and collections, including waste collections shall not take place outside of the following hours: 07:00 to 23:00 hours Monday to Saturday; and, 08:00 to 17:00 hours Sundays and Bank Holidays'.

7.8.19 Based on the context provided in the previous section, and provided delivery noise is managed and mitigated as far as practically possible by adopting the proposed control measures and operating procedures as outlined in the NMP, it is considered that the proposed delivery hours should be considered to be acceptable to MCC.

8 Mitigation Measures

8.1 Acoustic Barrier

- 8.1.1 As discussed in Section 7.5, the assessment detailed herein is based on the inclusion of an acoustic barrier to the eastern edge of the HGV delivery bay. The barrier results in a reduction in delivery noise of approximately 10 dB, within the noise model, at the most affected NSR. The barrier is to be constructed from continuous, imperforate material with a minimum mass of 12 kg/m² and is to extend from the ground to a minimum height of 3.5 m above the level of the site. The barrier should provide additional screening height to the screening provided by the recessed loading bay. As such, the base of the barrier must not be within the recessed loading bay area. Close-boarded or overlapped timber panelling would be suitable in this regard; hit-and-miss fencing would not. Alternatively, a proprietary acoustic fence with a minimum weighted sound reduction index of 25 dB R_w would be appropriate.
- 8.1.2 The barrier should extend at least 2 m northwards of the position indicated on the SMR Architects External Works drawing reference 7397-SMR-00-ZZ-DR-A-2004-A3, Revision C4, such that it would extend further than the 15 m length of the HGV. The location and extent is indicated on the figure in Appendix 2.
- 8.1.3 In addition, it is understood that the western side of the proposed plant deck will be screened by curtain walling, forming the façade to the west facing storefront. In order to mitigate noise sufficiently, the curtain walling or an additional out of sight non-decorative noise barrier should be designed and constructed from a continuous, imperforate material with a minimum mass of 12 kg/m². The extent and height should match the height and extent of the existing curtain walling and should be at least 2 m above the level of the plant deck.
- 8.1.4 The location of the baseline noise mitigation is indicated on the figure in Appendix 2.

8.2 Consideration of Other Discipline Requirements

- 8.2.1 It is recommended that you confirm the suitability of all recommended noise mitigation measures with your architects, structural engineers, building contractors, fire consultants and material manufacturers prior to procurement and field application so 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.

9 Conclusions

- 9.1 A noise assessment has been undertaken to predict the potential impact of HGV Deliveries and fixed plant at Fallowfield Retail Park, Manchester M14 6FS. This was prepared to support a full planning application for the development. The development proposal also includes sub-let units. The noise impact associated with these units may be addressed at a later date by the future tenant.
- 9.2 Measurements were undertaken at the location of the nearest residential dwellings to the proposed site to identify the pre-development background sound levels.
- 9.3 The potential impact of HGV deliveries and fixed plant noise emissions has been predicted within a CadnaA computer noise model of the site, and assessed in accordance with BS 4142:2014+A1:2019. The assessment has also considered HGV delivery and fixed plant noise emissions with respect to MCC's 'Planning and Noise Technical Guidance, October 2022'

- 9.4 The BS 4142 assessment indicated that the impact of fixed plant emissions, and the cumulative impact of HGV delivery and fixed plant emissions, is likely to be low during both the daytime and the night-time periods
- 9.5 Based on worst case background sound levels, the assessment indicated that noise from fixed plant emissions would be likely to meet MCC's numerical criteria during both the daytime and the night-time periods.
- 9.6 The assessment indicated that the cumulative noise impact of HGV delivery and fixed plant emissions may exceed MCC's numerical criteria. However, the numerical assessment has been based on onerous background sound levels. Based on this, alongside the context of the site, the existing noise climate at the site, and MCC's Planning and Noise Technical Guidance with respect to control measures and mitigation; it is considered that the exceedance of the numerical criteria presented, may be considered to be acceptable.
- 9.7 A review of the appeal decision in relation to an application to vary delivery restrictions of planning condition No. 10 related to the previously approved application, has been outlined.
- 9.8 Based on MCC and the Inspector's concerns regarding disturbance from deliveries during the quietest periods, it is proposed that any condition restricting deliveries may state that delivery hours are granted within the following hours: 07:00 to 23:00 hours Monday to Saturday; and, 08:00 to 17:00 hours on Sundays and Bank Holidays.
- 9.9 Provided delivery noise is managed and mitigated as far as practically possible by adopting the proposed control measures and operating procedures as outlined in the NMP, it is considered that the proposed delivery hours should be considered to be acceptable to MCC.

APPENDICES

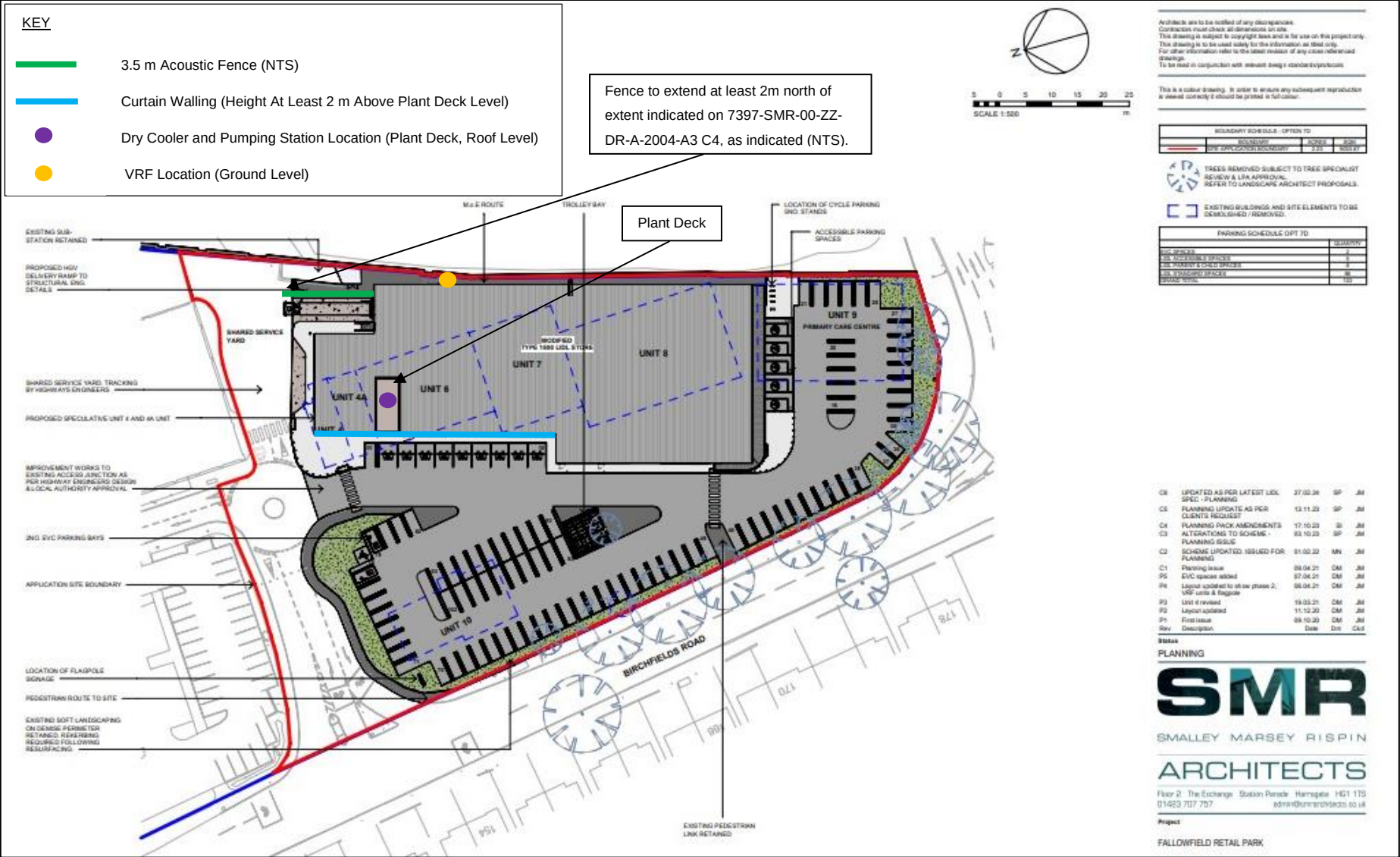
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Appendix 1: Site Location, Monitoring Location and Most Affected Noise Sensitive Receptor



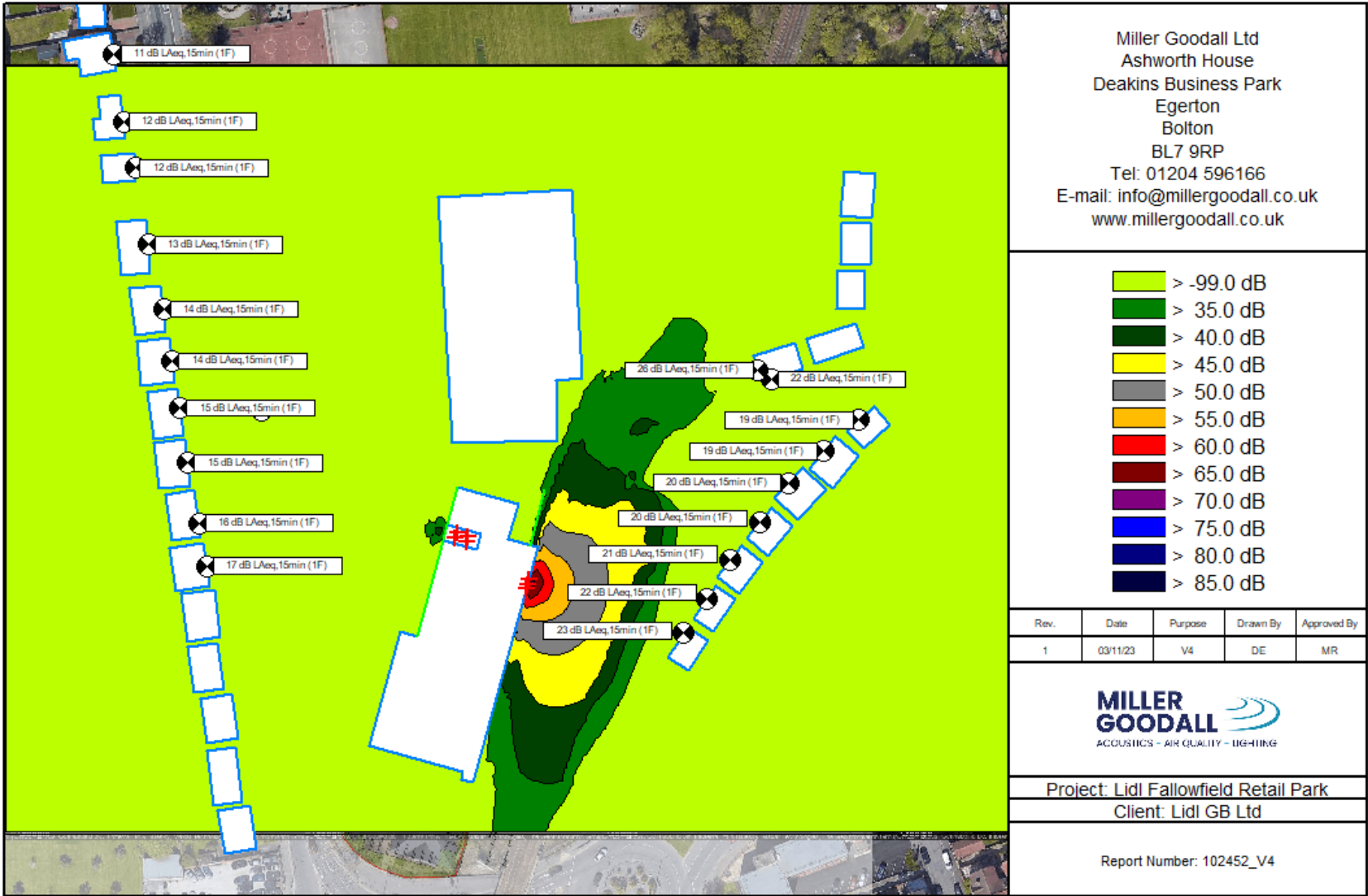
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Appendix 2: Proposed Development Plan, Including Modelled Mitigation and Plant Locations

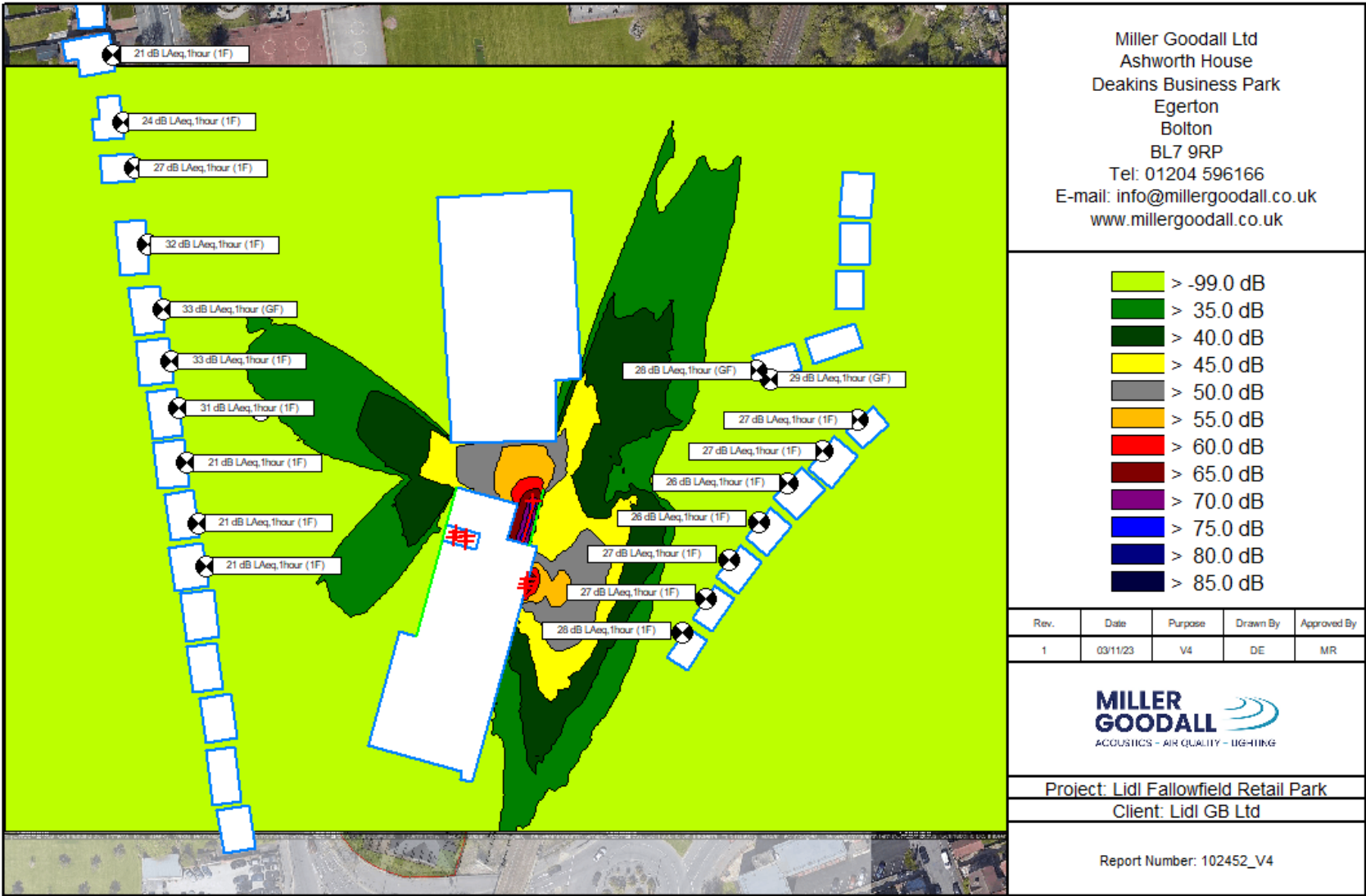


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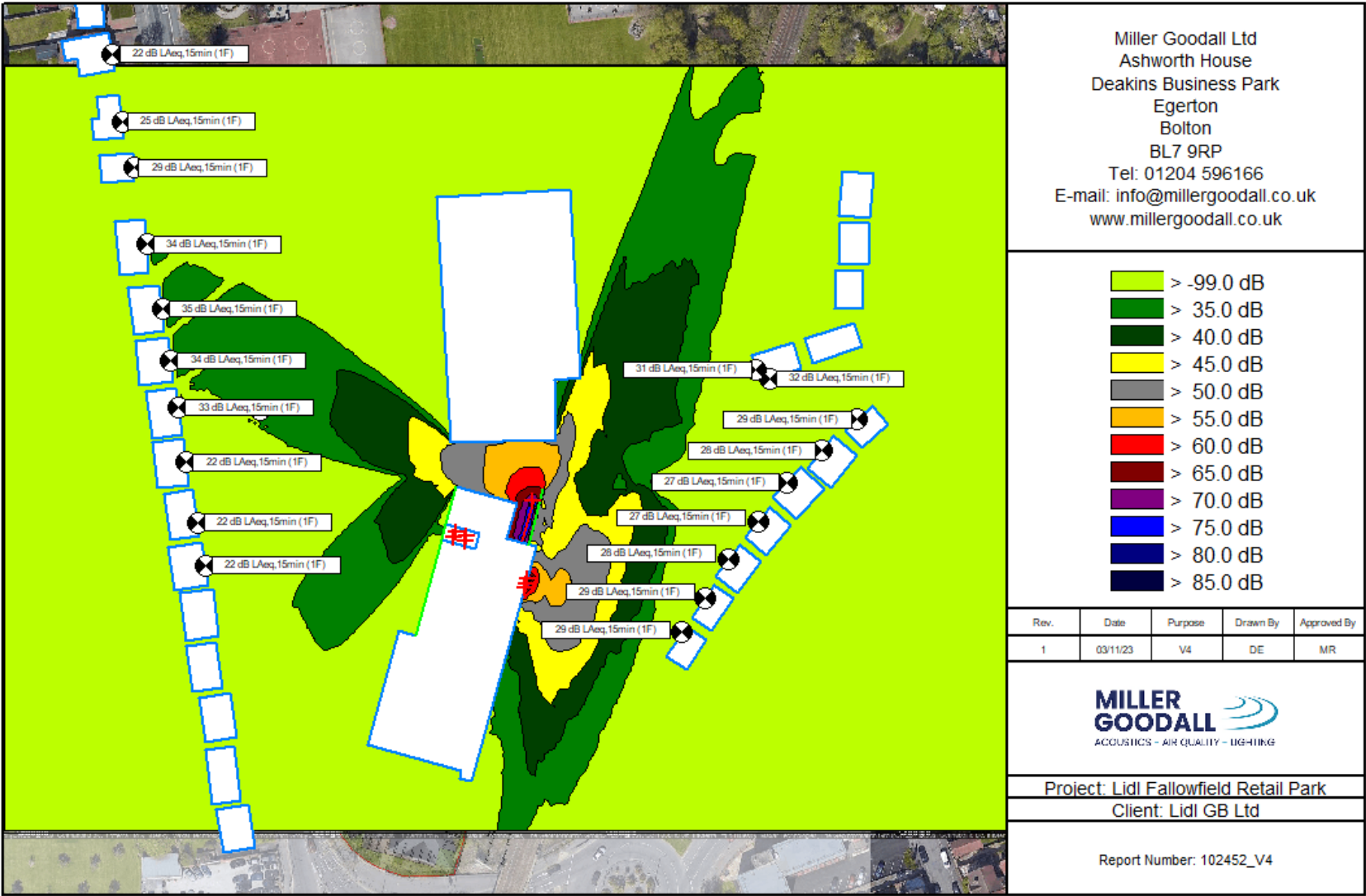
Appendix 3A: Predicted Night-time Plant Specific Noise Level – 4.0 m Grid Height



Appendix 3B: Predicted Daytime Cumulative Specific Noise Level – 1.5 m Grid Height



Appendix 3C: Predicted Night-time Cumulative Specific Noise Level – 4.0 m Grid Height



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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 μPa , 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 controlled 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_{Amax}** The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.
- R_w** Single number rating used to describe the sound insulation of building elements and is defined in BS EN ISO 10140-2: 2010 (formerly BSEN ISO 140-3:1995). It is derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.
- $D_{nT,w}$** The weighted standardized level difference is a single figure rating used to describe the sound insulation of a construction separating two rooms, for example a wall or floor, and is defined in BS EN ISO 16283-1:2014 (formerly BSEN ISO 140-4:1998). It is derived by measurement of an in-situ construction and therefore takes into account the effects of flanking transmissions, workmanship etc.
- $D_{ne,w}$** The weighted element-normalized level difference is a single figure rating used to describe the sound insulation of small elements within a larger construction and is defined in BS EN ISO 10140-2:2010 (BSEN ISO 140-10:1991). It is most often used to rate the sound insulation performance of ventilator units e.g. trickle vents.
- C_{tr}** A single-number spectrum adaptation term used to characterise the sound insulation rating with respect to urban traffic. It is defined in ISO 717-1:2013.

