



NOISE ASSESSMENT

on behalf of

SPORTS DIRECT PROPERTY

for the site at

**UNIT A2, CHEETHAM HILL RETAIL PARK,
QUEENS ROAD, MANCHESTER M8 8BB**

REPORT DATE: 18TH OCTOBER 2019

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Summary

A noise assessment was undertaken to assess the impact of extending the delivery hours associated with an existing retail unit at Cheetham Hill Retail Park to 06:00 hrs – 22:00 hrs daily, as part of a planning application for the unit to be occupied by a Lidl store.

A Plant Noise Assessment was undertaken in December 2018 by AECOM, which reported the results of a baseline noise survey representative of the closest residential receptor. We understand that this assessment has been accepted by the Local Authority, and the results of the noise survey were used to establish the Background Sound Levels for daytime and night-time periods within a BS 4142:2014+A1:2019 assessment for the proposed plant at the store. The reported baseline Background Sound Levels have been utilised for this report.

A CadnaA noise model of the proposed development site was created, and noise from Lidl deliveries was modelled using measurement data of a similar delivery at an existing Lidl store. The noise model was used to predict a Specific Noise Level for daytime and night-time periods at the residential receptor.

It was determined that noise resulting from the proposed extended delivery hours would result in a **low impact** at the residential receptor, with the inclusion of a 3 m high acoustic barrier.

Record of changes

Prepared By Reid Malster AMIOA

Reviewed By Matt Wilson

Signed



Signed



Date

18th October 2019

Date

18th October 2019

Version	Date	Change	Initials
1	18th October 2019	Initial Issue	RM

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1 Introduction

- 1.1 Miller Goodall Ltd has, on behalf of Sports Direct Property, undertaken a noise assessment in respect of the impact of noise associated with deliveries to a proposed Lidl store at Cheetham Hill Retail Park, Manchester.

2 Site Description

- 2.1 The site is located at Unit A2, Cheetham Hill Retail Park, Queens Road, Manchester M8 8BB. The delivery area assessed is shown in Appendix 1.
- 2.2 The Lidl store would form part of an established retail park, hosting several shops and fast-food restaurants.
- 2.3 There are existing residential dwellings to the north of the site, the closest of these being along the A6010 Queens Road, overlooking the delivery area from the opposite side of Queens Road.

3 Proposed Development and Delivery Hours

- 3.1 The proposal is to open a new Lidl store in Unit A2 which was previously occupied by another retail unit.
- 3.2 This assessment has been prepared to support an application to extend the current delivery hours associated with the unit. The new proposed delivery hours are 06:00 hrs – 22:00 hrs, seven days a week. This report assesses the impact of delivery noise for the proposed delivery hours. The proposals also include a new loading bay exclusively serving Unit A2 (see Appendix 1 and Appendix 2).

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.

¹ Noise Policy Statement for England, Defra, March 2010

- 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:

“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 February 2019. 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 contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve 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. 170 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

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

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. 180 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.

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 In section 3.6.1.5 of Manchester City Council's 'Noise and Planning Guidance' it is stated that:

"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."

4.4.2 We understand that Lidl's current standard delivery practice incorporates the mitigation controls stated above (reverse alarms are not used, refrigeration units are not used, and sealed delivery bays are used), alongside other control methods. The application for an extension to the delivery hours associated with the unit is made within the context of noise mitigation forming a part of Lidl's standard delivery practice.

5 Local Authority Consultation

5.1 Graeme Souter at MCC was consulted in respect of the methodology used in this assessment⁵. It was queried if they would accept the Background Sound Levels determined within the Plant Noise Assessment undertaken by AECOM in December 2018, which we understand have previously been accepted by the Local Authority. No response has been received to date.

⁵ Email to Graeme Souter 10/10/19

6 Acoustic Standards and Guidance

6.1 BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

- 6.1.1 This standard provides recommended guideline values for internal noise levels within dwellings which are similar in scope to guideline values contained within the World Health Organisation (WHO) document, Guidelines for Community Noise (1999)⁶. These guideline noise levels are shown in Table 1, below.

Table 1: BS 8233: 2014 guideline indoor ambient noise levels for dwellings

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

- 6.1.2 BS 8233:2014 advises that:

“regular individual noise events...can cause sleep disturbance. A guideline value may be set in terms of SEL^7 or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values”.

- 6.1.3 BS 8233:2014 adopts guideline external noise values provided in WHO for external amenity areas such as gardens and patios. The standard states that it is “desirable” that the external noise does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ whilst recognising that development in higher noise areas such as urban areas or those close to the transport network may require a compromise between elevated noise levels and other factors that determine if development in such areas is warranted. In such circumstances, the development should be designed to achieve the lowest practicable noise levels in external amenity areas.

⁶ World Health Organisation Guidelines for Community Noise, 1999

⁷ Sound exposure level or L_{AE}

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

6.2.1 The WHO Guidelines 1999 recommends that to avoid sleep disturbance, indoor night-time guideline noise values of 30 dB L_{Aeq} for continuous noise and 45 dB L_{AFmax} for individual noise events should be applicable. It is to be noted that the WHO Night Noise Guidelines for Europe 2009⁸ makes reference to research that indicates sleep disturbance from noise events at indoor levels as low as 42 dB L_{AFmax} . The number of individual noise events should also be taken into account and the WHO guidelines suggest that indoor noise levels from such events should not exceed approximately 45 dB L_{AFmax} more than 10 – 15 times per night.

6.2.2 The WHO document recommends that steady, continuous noise levels should not exceed 55 dB L_{Aeq} on balconies, terraces and outdoor living areas. It goes on to state that to protect the majority of individuals from moderate annoyance, external noise levels should not exceed 50 dB L_{Aeq} .

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

6.3.1 BS 4142:2014+A1:2019⁹ 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.

6.3.2 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).

6.3.3 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.

6.3.4 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*

⁸ WHO Night Noise Guidelines for Europe 2009

⁹ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

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.

- 6.3.5 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:

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.

- 6.3.6 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.

7 Impact of Delivery Noise

7.1 Noise Modelling

- 7.1.1 Predicted 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 Earth. This was used to determine road positions, building footprint areas and relative locations and is considered accurate to within 5%. Topographical information for the model was determined using Lidar data.
- 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 Delivery Noise within the model – Determination of Specific Noise Level

- 7.2.1 At present, LIDL's best practice delivery methodology reduces noise by removing the requirement for refrigeration units on the exterior of delivery wagons. 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.
- 7.2.2 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, unloading the stock, loading waste to be removed and finally leaving the site.

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

- 7.2.3 Octave band data for a typical delivery is shown below in Table 8. This data, measured at 2.0m from the midpoint 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.
- 7.2.4 Table 2 below shows a single figure value for the entire measurement and a calibrated value for a 15.0 m line source which represents the delivery wagon in the noise modelling.
- 7.2.5 Table 2 also shows data for a typical L_{AFmax} noise level associated with the delivery, noted to be movement of containers within the wagon once parked. This is modelled as a calibrated point source at 4.0m height at the midpoint of the wagon.
- 7.2.6 It is our understanding that there will be up to **two deliveries per day** at the proposed store.

Table 2: Octave Band Noise Data of a Lidl Delivery

	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	8.0 kHz	dB(A)
Measured Noise Levels (dB) at 2 m									
Total Delivery ($L_{eq,T}$)	37.7	48.4	52.6	58.4	61.3	61.1	60.7	57.2	67.2
Calibrated Model Noise Sources (dB) ($L_w.m^{-1}$ of 15m line source)									
Total Delivery	76.6	77.2	73.9	74.3	74	72.6	72.5	71.5	87.0

- 7.2.7 The most affected residential façade is a four-storey building, and with the inclusion of mitigation in the form of a 3 m high Acoustic Barrier the noise model predicts that delivery noise will be at its highest on the Fourth Floor (10 m height).
- 7.2.8 Daytime specific noise levels predicted over a 1 hour period are predicted to be 41 dB $L_{Aeq,1h}$. Night time specific noise levels predicted over a 15 minute period are predicted to be 43 dB $L_{Aeq,1h}$

7.3 Background Sound Level at the Residential Receptor

- 7.3.1 A Plant Assessment Report was previously undertaken by AECOM in December 2018 (Reference No. 60323172) and submitted as part of planning application number 121708/FO/2018.
- 7.3.2 The Background Sound Levels for daytime and night-time periods measured in December 2018 and reported as part of the assessment were:
- 56 dB L_{AF90} for the daytime
 - 47 dB L_{AF90} for the night-time

- 7.3.3 The measurement location utilised in the Plant Assessment Report undertaken by AECOM is representative of the noise-sensitive receptor.

7.4 Specific Noise Level

- 7.4.1 A BS 4142:2014+A1:2019 noise impact assessment has been undertaken in order to assess the potential noise impact at the most affected location of the proposed development site and is detailed in this section of the report.
- 7.4.2 Both daytime (07:00-23:00) and night-time (23:00-07:00) periods have been assessed. The proposed delivery hours are 06:00 hrs – 22:00 hrs.
- 7.4.3 Since the delivery process takes 40 minutes and the reference interval for a daytime BS 4142:2014+A1:2019 assessment is 1 hour, it is necessary to apply an on-time correction to the predicted noise level in order to derive the Specific Noise Level. The correction has been calculated by:

$$L_{Specific} = L_{Predicted} + 10 \log \left(\frac{t_2}{t_1} \right)$$

Where t_1 and t_2 are the times to be corrected from and to, respectively

- 7.4.4 This results in a daytime Specific Noise Level of 41 dB $L_{Aeq,1hour}$. Since the reference interval for the night-time is 15 minutes, no on-time correction is required, so the night-time Specific Noise Level is 43 dB $L_{Aeq,15min}$.

7.5 Rating Penalty

- 7.5.1 A worst case rating penalty of +6 dB has been included in this assessment. This accounts for the sudden onset impulsive noise events associated with a typical delivery period. This includes release of air breaks, reversing tones and interaction of goods crates moving over the ramp at the interface between the store and the delivery vehicle.
- 7.5.2 The effect of these noises can be reduced using management techniques, such as broadband noise reversing alarms, air break silencers and good design and maintenance of the lip connecting the vehicle to the store at the new delivery bay door.

7.6 Acoustic Barrier

- 7.6.1 The predicted noise levels presented within this report are dependent on the Acoustic Barrier shown in Appendix 1. This is to protect noise from deliveries impacting on noise sensitive receivers in the vicinity of the residential properties and prevents an adverse impact during the night-time.
- 7.6.2 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 3.0 m above the level of the site at its western boundary. 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.
- 7.6.3 The barrier would need to be constructed at the location marked in Appendix 1. In this case, the attenuation achieved by the barrier is highly dependent on the barrier being close to the noise source.

- 7.6.4 Erecting a 3 m barrier further away from the location marked (e.g. at the site boundary) would significantly reduce the performance of the barrier at the noise-sensitive receptor.
- 7.6.5 It will be important that the barrier design is reviewed by structural engineers and transport consultants to ensure all safety implications are taken into account.

7.7 BS 4142:2014+A1:2019 Assessment

- 7.7.1 Based on the above assumptions, the BS 4142:2014+A1:2019 assessment of noise impact at the most affected residential receptor is shown in Table 3 and Table 4 below:

Table 3: BS 4142:2014+A1:2019 Noise Impact Assessment: Daytime

Results		Relevant Clauses of BS 4142:2014	Commentary
Background Sound Level	$L_{AF90,15mins} = 56 \text{ dB}$	8.1.2 8.3	Determined from a series of 15-minute measurements between 14:25 hrs – 15:40 hrs & 22:10 hrs – 22:40 hrs in December 2018 as part of a Plant Assessment Report undertaken by AECOM.
Assessment made during the night-time, so the reference interval is 1 hour		7.2	
Specific Sound Level	$L_{Aeq,1hour} = 41 \text{ dB}$	7.3.3 eqn(2)	
Acoustic feature correction	+6 dB	9.2	Impulsiveness (banging sounds from loading) clearly perceptible at receptor
Rating Level	$(41 + 6) \text{ dB} = 47 \text{ dB}$		
Excess of Rating Level over Background Sound Level	$(47 - 56) \text{ dB} = -9 \text{ dB}$		
Assessment indicates likelihood of low impact		11	Initial estimate only
Context		11 8.5	The assessment relates to an extension to delivery hours in an area where delivery noise from the loading bay area associated with previous retail use is an established part of the ambient acoustic environment.
Uncertainty of the assessment		10	The Rating Level is significantly below the Background Sound Level. Factors within the assessment that may introduce uncertainty would not change the outcome of this assessment and are therefore insignificant.

Table 4: BS 4142:2014+A1:2019 Noise Impact Assessment: Night-time

Results		Relevant Clauses of BS 4142:2014	Commentary
Background Sound Level	$L_{AF90,15mins} = 47 \text{ dB}$	8.1.2 8.3	Determined from a series of 15-minute measurements between 23:00 hrs – 00:15 hrs in December 2018 as part of a Plant Assessment Report undertaken by AECOM.
Assessment made during the night-time, so the reference interval is 15 min		7.2	
Specific Sound Level	$L_{Aeq,15mins} = 43 \text{ dB}$	7.3.3 eqn(2)	
Acoustic feature correction	+6 dB	9.2	Impulsiveness (banging sounds from loading) clearly perceptible at the receptor.
Rating Level	$(43 + 6) \text{ dB} = 49 \text{ dB}$		
Excess of Rating Level over Background Sound Level	$(49 - 47) \text{ dB} = +2 \text{ dB}$		
Assessment indicates likelihood of low impact		11	Initial estimate only
Context		11	The proposed delivery hours would only impact one hour of the eight-hour night-time period, with a delivery lasting 40 minutes.
		8.5	A difference of around + 5 dB is likely to be an indication of an adverse impact. Given the mitigation within Lidl's delivery process and that delivery noise is an established part of the ambient acoustic environment the impact is clearly low.
Uncertainty of the assessment		10	Factors of uncertainty within the assessment would not change the result such that an adverse impact would clearly be likely. Uncertainty is therefore not considered to require significant consideration in this case.

- 7.7.2 The assessment of the night time period is done with reference to a baseline L_{A90} of 47 dB measured for a period between 2300 and 0030. This represents the start of the night when traffic in the area is likely to be relatively low and representative of when people would be likely to be going to bed, no deliveries are proposed in this period. Early morning deliveries in the night time period between 0600 and 0700 are likely to occur during the beginning of the morning rush hour around central Manchester and as such the use of 47 dB as the reference baseline noise level is considered worst case and representative of a Sunday morning when traffic levels would be lower.
- 7.7.3 It can be seen from the BS 4142:2014+A1:2019 assessments undertaken that the proposed extension to delivery hours associated with the unit would have a **low impact** at the residential receptor. It is possible that residents may still complain in relation to delivery noise, however BS 4142:2014+A1:2019 states that '*not every complaint is proof of an adverse impact*'.

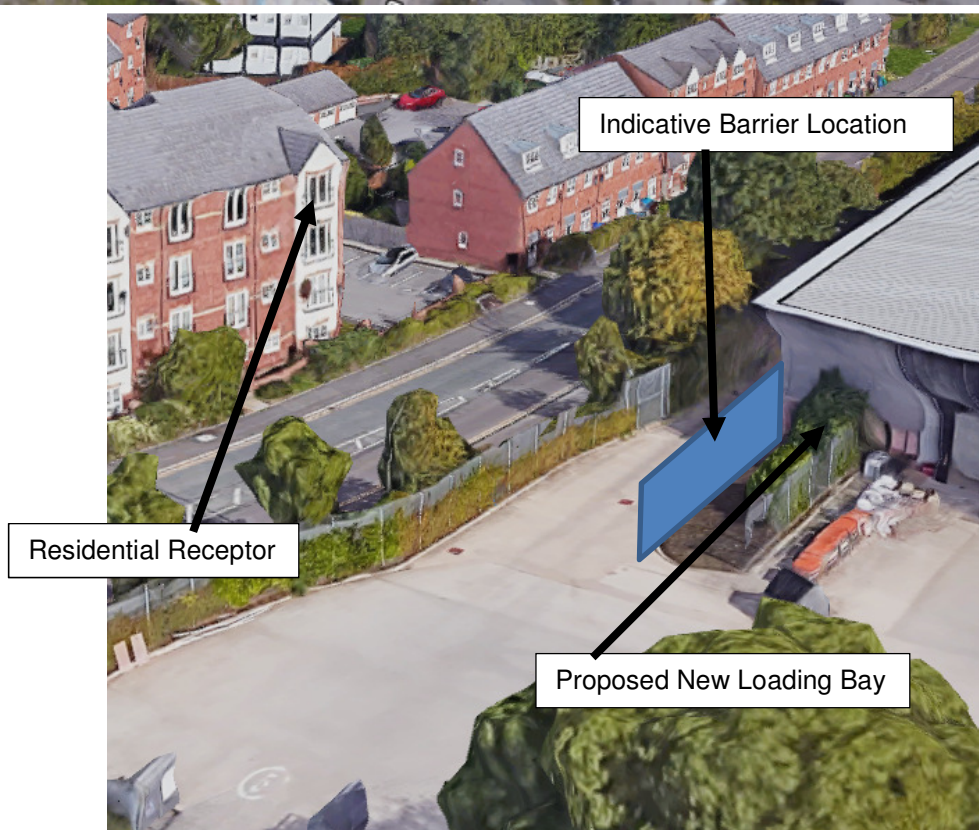
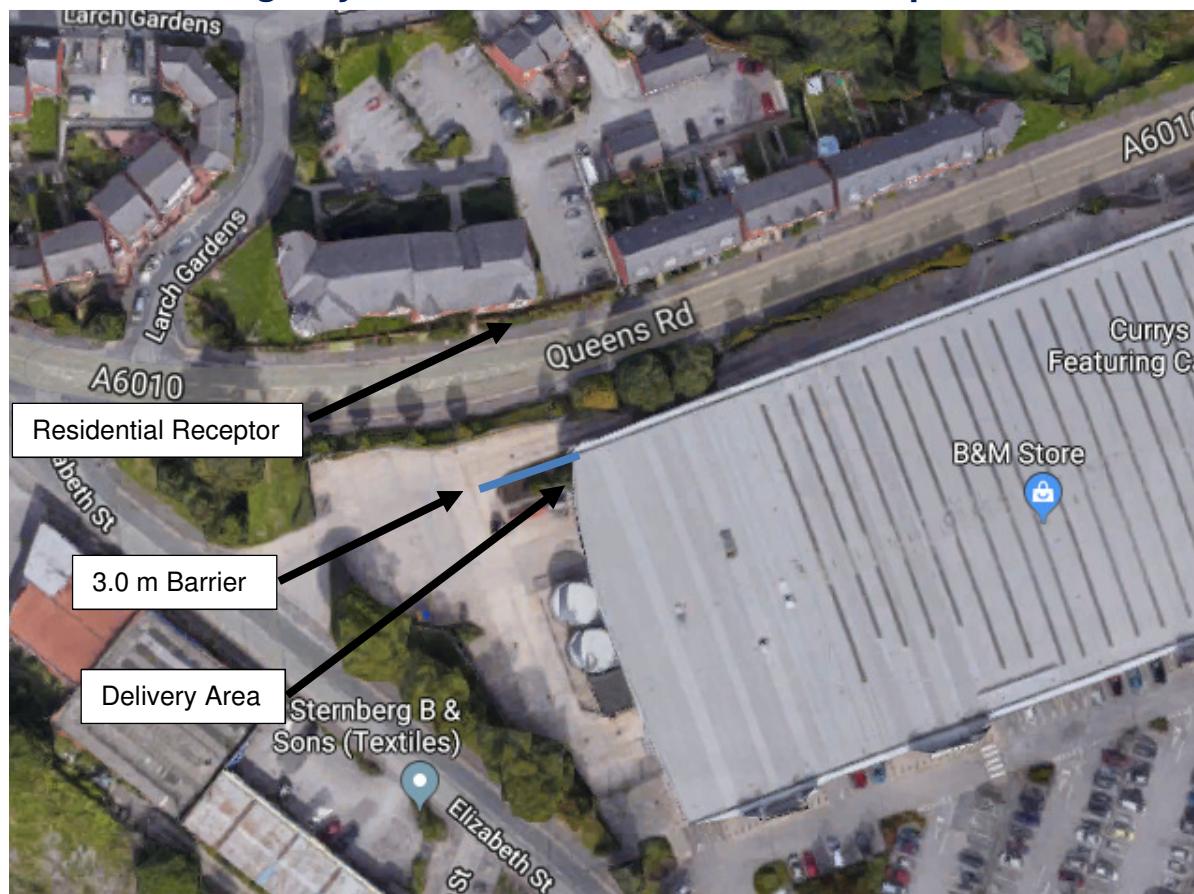
8 Conclusions

- 8.1 A noise assessment was undertaken to assess the impact of extending the delivery hours associated with an existing retail unit to 06:00 hrs – 22:00 hrs daily, as part of a planning application for the unit to be occupied by a Lidl store.
- 8.2 A Plant Noise Assessment was undertaken in December 2018 by AECOM, which reported the results of a baseline noise survey representative of the closest residential receptor. We understand that this assessment has been accepted by the Local Authority, and the results of the noise survey were used to establish the Background Sound Levels for daytime and night-time periods within a BS 4142:2014+A1:2019 assessment.
- 8.3 A CadnaA noise model of the proposed development site was created, and noise from Lidl deliveries was modelled using measurement data of a delivery. The noise model was used to predict a Specific Noise Level for daytime and night-time periods at the residential receptor.
- 8.3.1 It was determined that noise resulting from the proposed extended delivery hours would result in a **low impact** at the residential receptor, with the inclusion of a 3 m high acoustic barrier.

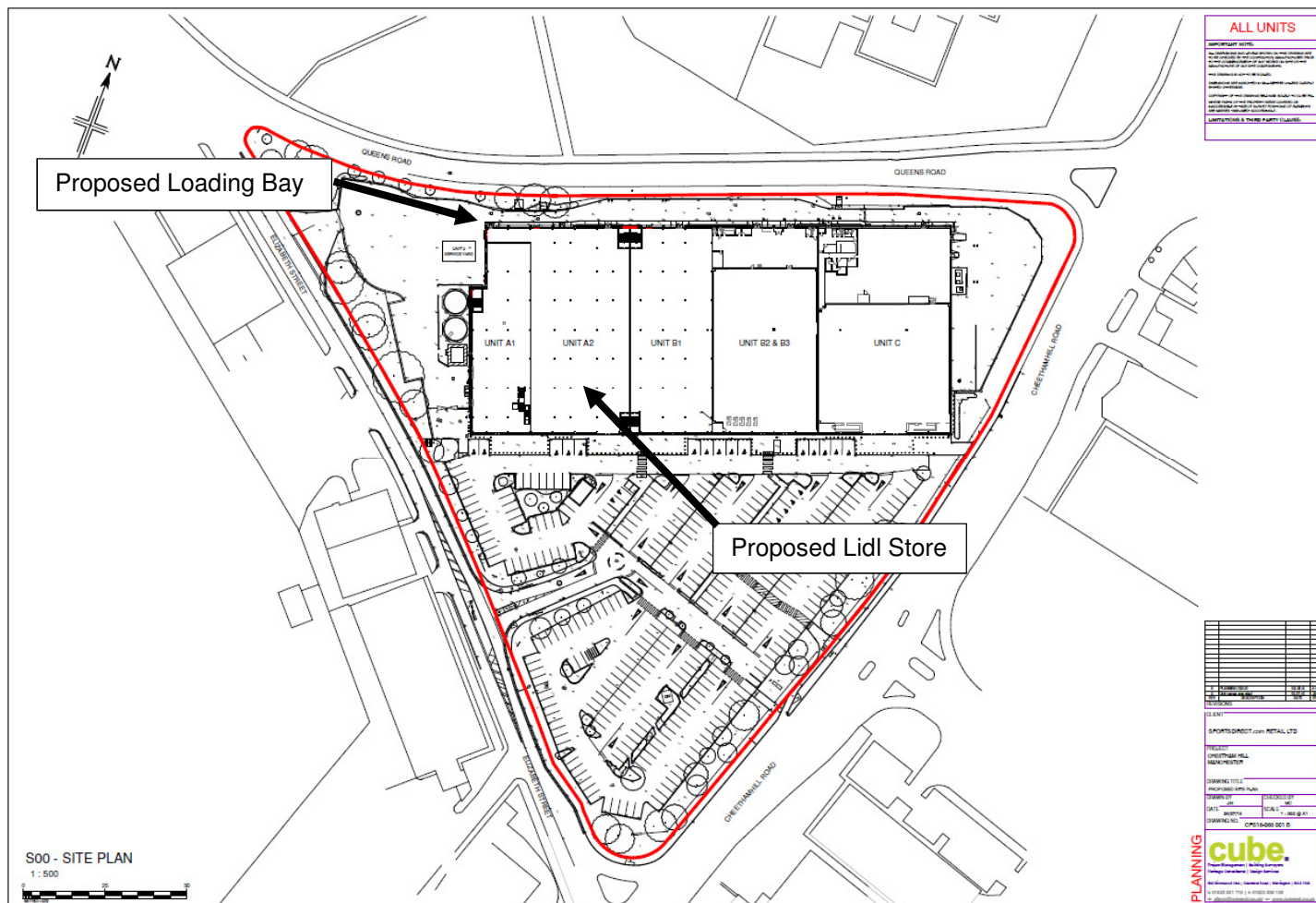
9 APPENDICES

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Appendix 1: Loading Bay Location and Residential Receptor



Appendix 2: Site Layout



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.

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