SHARPS REDMORE

ACOUSTIC CONSULTANTS • Established 1990

Report

Broughton Park, Chester

Environmental Noise Assessment. Lidl Foodstore Development.

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Appendices

1.0 Introduction

1.1 Sharps Redmore (SR) has been instructed to undertake an environmental noise assessment for a food store development at land north of Broughton Shopping Park, Chester Rd, Broughton, CH4. The site location is shown in Appendix A.

1.2 The objective of the assessment is to determine the impact (if any) of noise that may be generated as a result of the proposal and how that may affect the amenities of existing residents, if at all.

1.3 The site is to the north of Broughton Shopping Park, a large existing commercial mixed-use estate off the main A5104, Chester Road. A Tesco supermarket is immediately to the south with an Aldi foodstore to the west, together with The Mill House Inn Public House. The large Airbus factory site is to the north of the proposal.

1.4 The nearest residential properties are along Simonstone Road to the west, and isolated properties to the north along Chester Road.

1.5 Section 2.0 of this report contains a discussion of the available methods of assessment and assessment criteria.

1.6 Section 3.0 of this report sets out the findings of an acoustic survey, undertaken at the closest noise sensitive premises in the proximity of the site. Other residential dwellings are in the vicinity but further away, and the conclusions are valid for all receptors.

1.7 The different components of operational noise are considered in sections 4.0 and 5.0 of this report and assessment conclusions are contained in Section 6.0.

2.0 Assessment methodology and criteria

National Policy

2.1 Technical Advice Note 11 (TAN11) considers noise generating development. It states that "*Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions"*.

2.2 The Noise and Soundscape Plan For Wales 2023-2028 considers acoustic design. Acoustic design is an approach to design relating to the sound environment, the principal technical objective of which is to protect people from the unwanted and/or harmful effects of noise. The proposed Welsh Government guidance, intended to replace the old TAN 11, takes a progressive step by also defining soundscape design. It describes this as a participatory, people-focused approach to design concerning both the acoustic environment and any physical or non-physical non-acoustic factors that may affect how people perceive and/or experience sound in a specific context.

2.3 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

i) The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation (WHO) "*Guidelines for Community Noise"* contain such guidelines.

ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question.

iii) Another method is described within BS 4142:2019 +A1 to determine the significance of sound impact from sources of industrial and/or commercial nature. The sources that the revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

Guideline noise values

2.4 There are a number of guidance documents that contain recommended guideline noise values. These are discussed below.

2.5 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.

2.6 The WHO advice is the most useful, comprehensive, and pertinent advice in this case, because it is not specific to the circumstances of the assessment. Instead, it provides guidance on acceptable limits in, for example, schools, dwellings and offices from noise occurring within the community.

2.7 The WHO guideline values are appropriate to what are termed "critical health effects". This means that the limits are at the lowest noise level that would result in any psychological or physiological effect. They are, as defined by NPSE, set at the Lowest Observed Adverse Effect Level (LOAEL), but do not define the level above which effects are significant (the SOAEL). Compliance with the LOAEL should, therefore, be seen as a robust aim.

2.8 The National Physical Laboratory document *"Health Effect based noise assessment methods; a review and feasibility study", (September 1998)* contains an "interpretation" of the WHO guidelines (then in draft form) for the DETR. The summary of this section of the NPL report states *"In essence, the WHO guidelines represent a consensus view of international expert opinion on the lowest threshold noise levels below which the occurrence rates of particular effects can be assumed to be negligible. Exceedances of the WHO guideline values do not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher degrees of noise exposure are reached"* (paragraph 5.4).

The World Health Organisation/BS 8233 guideline noise values are summarised in the Table 2.1 below:

Table 2.1: WHO/BS 8233 guideline noise values

Document	Level	Guidance
World Health Organisation "Community Noise 2000"	L_{AeqT} = 55 dB	Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	L_{AeqT} = 50 dB	Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	L_{AeqT} = 35 dB	Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	L_{AeqT} = 30 dB	Sleep disturbance, night-time (indoors)
	L_{AMAX} = 60 dB	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
	L_{AMAX} = 45 dB	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)
BS 8233:2014 "Sound Insulation and noise reduction for buildings"	L_{AeqT} = 55 dB	Upper limit for external steady noise. (gardens and patios).
	L_{AeqT} = 50 dB	Desirable limit for external steady noise. (gardens and patios).
	$L_{Aeq\ 16\ hours}$ = 35 dB	Resting, living room day. (Internal – steady noise)
	$L_{Aeq\ 16\ hours}$ = 40 dB	Dining, dining room day. (Internal – steady noise)
	$L_{Aeq\ 16\ hour}$ = 35 dB	Sleeping, bedroom day (Internal – steady noise)
	$L_{Aeq\ 8\ hours}$ = 30 dB	Sleeping, bedroom night (Internal – steady noise)

2.9 For L_{AeqT} criteria the time base (T) given in the documents is 16 hours for daytime limits (0700-2300 hours) and 8 hours for night time limits (2300-0700 hours).

Changes in noise level

2.10 Changes in noise levels of less than 3 dBA are not perceptible under normal conditions and changes of 10 dBA are equivalent to a doubling of loudness. This guidance has been accepted by inspectors, at inquiry, to encompass changes in noise levels in the index L_{AeqT}.

2.11 The following table shows the response to changes in noise (known as a semantic scale); this table has been developed from general consensus opinion of acousticians.

Table 2.2: Change in noise level

Change in noise level L_{AeqT} dB	Response	Impact
<3	Imperceptible	None
3 – 5	Perceptible	Slight/moderate
6 – 10	Up to a doubling	Moderate/significant
11 – 15	More than a doubling	Substantial
>15	-	Severe

2.12 Where the existing ambient noise level is already above the criteria developed from the various guidance documents, it may be considered unreasonable to adopt such criteria. It would be reasonable, however, given the above statement, to consider criteria which do not exceed the existing noise climate, thus giving rise to an overall 3 dB increase i.e. the minimum perceptible. If it is less than the minimum perceptible it cannot be described as disturbing or to affect the amenity of residents.

Assessment using BS 4142:2019 +A1

2.13 This British Standard enables the significance of sound impact to be determined in relation to industrial and commercial sources. The significance of sound impact is to be determined according to the following two stage process:

1) Assess background and residual noise levels; predict new noise levels, apply correction to predicted levels, as appropriate to arrive at a rating level and compare this rating level to the existing background level. Use this to make an initial estimate of impact;

2) Consider this level difference in the context of the site.

2.14 Matters which the standard recommends are relevant in order to consider context are, as shown in Table 2.3 below:

2.15 As discussed, this BS described a method for rating and assessing sound of industrial and/or commercial nature according to the following summary process:

i) Carry out a numerical assessment of the noise, taking into the character and areas of uncertainty, by comparing the noise against the existing background noise level. The greater the difference between the two, the greater the impact.

ii) By considering the noise impact against the context in which it is placed. There are many contextual points to consider when considering an assessment of sound impact including the following:

- The absolute level of sound.
- The character and level of the specific sound compared to the existing noise climate.
- The sensitivity of the receptors.
- The time and duration that the specific sound occurs. The conclusions of assessments undertaken using alternative assessment methods, for example WHO guideline noise values or change in noise level.
- The ability to mitigate the specific sound through various methods, for example by screening, the selection of quiet plant equipment, the use of attenuators, through the imposition of noise management plans and good practice, façade design and layout/orientation.
- The form and scale and scale of a development. For example, does the proposed development involve a new industrial/commercial premise or is the proposal the installation of new plant or an extension to an existing premises?

2.16 It is therefore entirely possible that whilst the numerical outcome of a BS 4142 assessment is indicative of adverse or even significant adverse impact, when the proposal is considered in context the significance of the impact is reduced to an acceptable level.

Table 2.3: BS 4142 notes on context

Factor	BS 4142 commentary	Notes
Absolute level of sound	*For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.* *Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.* *Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse*	Guidance on appropriate or significant absolute levels such as L_{Aeq} values for day or night or L_{Amax} values for night time can be found in the World Health Organisation's "Guidelines for Community Noise" and in British Standard BS 8233: 2014 "Guidance on sound insulation and noise reduction for buildings". When existing levels are low, particularly at night, absolute levels will often provide a better assessment tool. At night, the L_{Amax} factor will often

Factor	BS 4142 commentary	Notes
	impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.	be the key parameter to assess potential sleep disturbance.
The character and level of the residual sound compared to the character and level of the specific sound.	*Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*	Experience and judgement will generally provide an excellent guide to determine the extent to which a specific sound might stand out or be in keeping with the existing surroundings. Whilst a technical assessment of character is sometimes desirable, it is also possible to consider character without the need for technical comparisons.
Sensitivity of receptor	*The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:* *i) facade insulation treatment;* *ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and* *iii) acoustic screening.*	If the existing noise sensitive premises (NSP) already have good quality windows (acoustically) and alternative means of ventilation or screening, then this needs to be considered. The intrinsic sensitivity of a particular use is also relevant. For example, whether the NSP is a school, office or dwelling is relevant.

2.17 Therefore assessments have been undertaken using the following methods:

- Car parking: Comparison with WHO guideline values
- Mechanical Services/operational noise: BS 4142:2014
- Deliveries Activity: BS 4142:2014

Local Policy

2.18 Flintshire Local Development Plan 2015-2030 considers noise within Policy EN18; partly stated below in italics.

EN18: Pollution and Nuisance New development which is sensitive to the effects of existing noise, vibration, odour, dust, light or other pollution or nuisance, will be permitted only if it can be demonstrated that appropriate measures can be taken to mitigate any potential adverse effects. New development which would create an increased risk of noise, vibration, odour, dust, light or other pollution or hazard will only be permitted if: a. it would not unacceptably harm general amenity or living conditions; and b. it would not impose significant restrictions on the use or development of surrounding land.

3.0 Survey details

3.1 An environmental noise survey was carried out between 18th and 19th November 2025 at positions shown in Figure 3.1 below. The measurement locations (MP1 and MP2) were chosen to be representative of the nearest residential properties to the site to the west and north to give representation of existing ambient and background noise levels at likely times of operation of the proposal.

Figure 3.1. Monitoring Positions for noise surveys:

3.2 A location was selected to the west of the proposal to be as representative as possible of the most sensitive nearest residential properties to the proposal as identified on Simonstone Road to the west (MP1) and on Chester Road to the north (MP2). A survey over approximately 24 hours was undertaken at MP1. Manned measurements were undertaken at MP2 due to site security. The survey was undertaken in free field with the microphone at least 1.5 metres above the ground. The survey concluded that the noise climate was described by road traffic noise along A5104 at both sites and local traffic and activity on the existing commercial estate and supermarkets. Road traffic noise was particularly dominant at MP2 given the proximity of the A5104.

3.3 The instrumentation used to carry out the noise survey was as follows:

- RION NL52 Type 1 precision sound level meter (SLM)
- RION NC74 calibrator

3.4 The SLM was set to measure the following "A" weighted parameters: L_{Aeq} , L_{A90} and L_{Amax}. The measurement sample period was 15 minutes. Immediately before and after the measurements were carried out, the SLM was calibrated using the calibrator and no drift was noted.

The weather was generally suitable for the measurement of environmental noise during the survey. The weather at the start of the survey was sunny, a temperature of around 12^0C and little to no wind at ground level. For brevity, a summary of the surveys is shown below in tables 3.1 and 3.2 (Full Survey data is available if required).

Table 3.1 Survey Summary 18th-19th November 2025 (MP1 Simonstone Road)

Measurement Period	Measured Noise Level, dB			
	$L_{Aeq,15m}$ (range)	L_{Aeq} (log average)	L_{Amax} (typical)	L_{A90} (typical)
Day 0700-2300	42-57	52	70	44
Night 2300-0700	38-50	43	58	37
Morning 0600-0800	48-53	51	70	43

Table 3.2 Manned Survey Summary 18th November 2025 (MP2 Chester Road)

Measurement Period	Measured Noise Level, dB			
	$L_{Aeq,15m}$ (range)	L_{Aeq} (log average)	L_{Amax} (typical)	L_{A90} (typical)
Day 0700-2300	75-77	76	88	67

4.0 Noise from mechanical services plant

4.1 Such plant serving the proposal may consist of refrigeration and condenser units, air handling units, extract fans, and air curtains.

4.2 Since this plant would form part of the proposed development, precise details of which are unknown at this stage, it is possible to incorporate noise control measures to ensure a reasonable noise level is achieved.

4.3 Typical background noise levels can be used to set target levels as set out in Section 2 above at the boundary to the nearest noise sensitive premises.

4.4 The achievement of a particular noise level from plant associated with the development can be ensured by the imposition of a planning condition. The following condition is suggested and widely used for such applications:

> *"The rating level of noise emitted by all fixed plant shall not exceed the representative background level as determined at the nearest noise sensitive premises. Measurement and assessment shall be according to BS 4142:2019 +A1."*

4.5 SR has advised similar installations around the UK and are confident that these values can easily be achieved by the distances involved to the nearest residential property, plant selection, layout (including orientation), partial enclosure (where necessary), and operating regime.

4.6 Background level should be representative of both the particular circumstances and periods of interest. BS 4142:2019 +A1 states that for this purpose, the objective is not simply to obtain the lowest measured background level but rather to quantify what is typical during particular time periods.

5.0 Noise from deliveries and site

5.1 Various activities associated with servicing the proposal have the potential to have a noise impact beyond the site boundary. At this site, noise from the approach to and departure from the service yard serving the food store will be the major noise source to be considered. Noise sources will therefore comprise:

- Goods vehicles arriving, manoeuvring and departing;
- Unloading of goods vehicles;
- Customer vehicles

5.2 The nearest noise sensitive premises to the service areas and approach route are the dwellings on Chester Road to the north at approximately 100m from the service area and on Simonstone Road at approximately 260m to the west of the service area.

Deliveries

5.3 The noise levels of the different components of delivery activity have been measured at many similar sites, and the following maximum levels have been recorded, at reference distance of 10 metres:

Table 5.1: Noise levels from service activity at 10 metres

Event Noise Level								
Arrival			Unloading			Departure		
Duration (mins)	L_{AeqT} (dB)	L_{Amax} (dB)	Duration (mins)	L_{AeqT} (dB)	L_{Amax} (dB)	Duration (mins)	L_{AeqT} (dB)	L_{Amax} (dB)
2.5	69	75	20	66	75	0.5	72	75

5.4 Service yard levels have been predicted at the nearest noise sensitive residences as outlined in 5.2 above. The closest areas have been shown to provide a worst-case for operations. The food store building itself provides substantial screening for both receptor sites. The site layout shows this at Appendix A. A conservative 10 dB attenuation has been considered. It should be noted that the sound levels shown included all service yard noise sources during a delivery such as reversing alarms, refrigeration units, and vehicle manoeuvres, to represent worst case scenario and extrapolated to provide 1-hour L_{Aq} levels. As such, this represents a worst-case robust assessment. The predictions for both receptor sites are shown in tables 5.2 and 5.3 below.

5.5 Access to the site will be from the existing service road currently enabling access for deliveries to the operating Broughton Shopping Park.

Table 5.2: Predicted Service Yard Noise Levels MP1: Simonstone Road

Activity	L_{Aeqt} dB	Duration (mins)	Screening attenuation	Distance Attenuation (260m) (20log 10/260)	L_{Aeq} 1-hour conversion dB	$L_{Aeq\ 1hr}$ dB	L_{Amax} dB
Arrival	69	2.5	-10	-28	(10 log 2.5/60) = -14	17	75
Unload	66	30	-10	-28	(10 log 20/60) = -5	23	
Depart	72	0.5	-10	-28	(10 log 0.5/60) = -21	13	
Total $L_{Aeq\ 1\ hr}$						24	
Totals							Max 47

Table 5.3: Predicted Service Yard Noise Levels MP2: Chester Road

Activity	L_{Aeqt} dB	Duration (mins)	Screening attenuation	Distance Attenuation (100m) (20log 10/100	L_{Aeq} 1-hour conversion dB	$L_{Aeq\ 1hr}$ dB	L_{Amax} dB
Arrival	69	2.5	-10	-20	(10 log 2.5/60) = -14	25	75
Unload	66	30	-10	-20	(10 log 20/60) = -5	31	
Depart	72	0.5	-10	-20	(10 log 0.5/60) = -21	21	
Total $L_{Aeq\ 1\ hr}$						32	
Totals							Max 55

5.6 The $L_{Aeq\ 1hr}$ for the closest service yard activity at the nearest residential properties is below the existing levels across all parameters for all time periods. Predicted L_{Amax} levels are below existing L_{Amax} levels from existing activity. The predicted levels are below WHO guidelines and criteria within BS 8233:2014. Consequently, it is not considered that there will be any significant impact from noise from service yard activity. In context, there is significant existing commercial activity near the site and this will not introduce a new or distinct noise source.

Noise from road traffic on surrounding network

5.7 A comparison of the increase in road traffic noise can be made by means of the formula found in "Calculation of Road Traffic Noise": Increase in Noise Level = 10 $\log_{10}$ (future total traffic flow ÷ existing traffic flow) dB.

5.8 To increase the noise level by 3 dBA, the minimum perceptible, the future traffic flow would need to be at least twice the existing traffic flow.

5.9 An initial overview of the likely road traffic increase and consideration of the existing noise levels, the level of traffic from the proposal should be negligible compared to existing traffic levels on the road network.

5.10 Further detail can be provided on this aspect of the proposal as the scheme develops, if required.

Car parking

5.11 Parking spaces are provided to the southern and western elevation of the proposal. The closest car parking spaces will be approximately 180m from the both receptor sites to the north and west.

5.12 SR has previously undertaken many noise surveys at office and retail car parks. At 10m from the boundary of a busy car park measured noise levels of 43-48 dB $L_{Aeq\ 1hr}$ have been found. Peak noise levels in car parks are attributed to door slams. SR has measured many door slams as part of noise surveys and peak noise levels are considered to be up to 66 dB L_{Amax} at 10m.

5.13 The closest car parking spaces to residential properties will be approximately 180m. At this distance the above levels will be in the region of 23 dB L_{Aeq} and maximum levels in the region of 41dB L_{Amax}. These predicted car parking noise levels are considerably below existing daytime and night time ambient noise climate and within guidance levels.

5.14 The existing noise environment at the closest residential would mean that any parking activity would be inaudible. The above figures can be considered a worst-case scenario to provide a robust assessment.

6.0 Assessment Conclusion

6.1 Noise survey data obtained in November 2025 has been used to assess the existing noise climate near the proposal at its proximity to nearby residential properties.

6.2 External noise level criteria have been proposed in line with the standards set out in the World Health Organisation guidelines, BS 8233:2014 and BS 4142:2014 +A1:2019

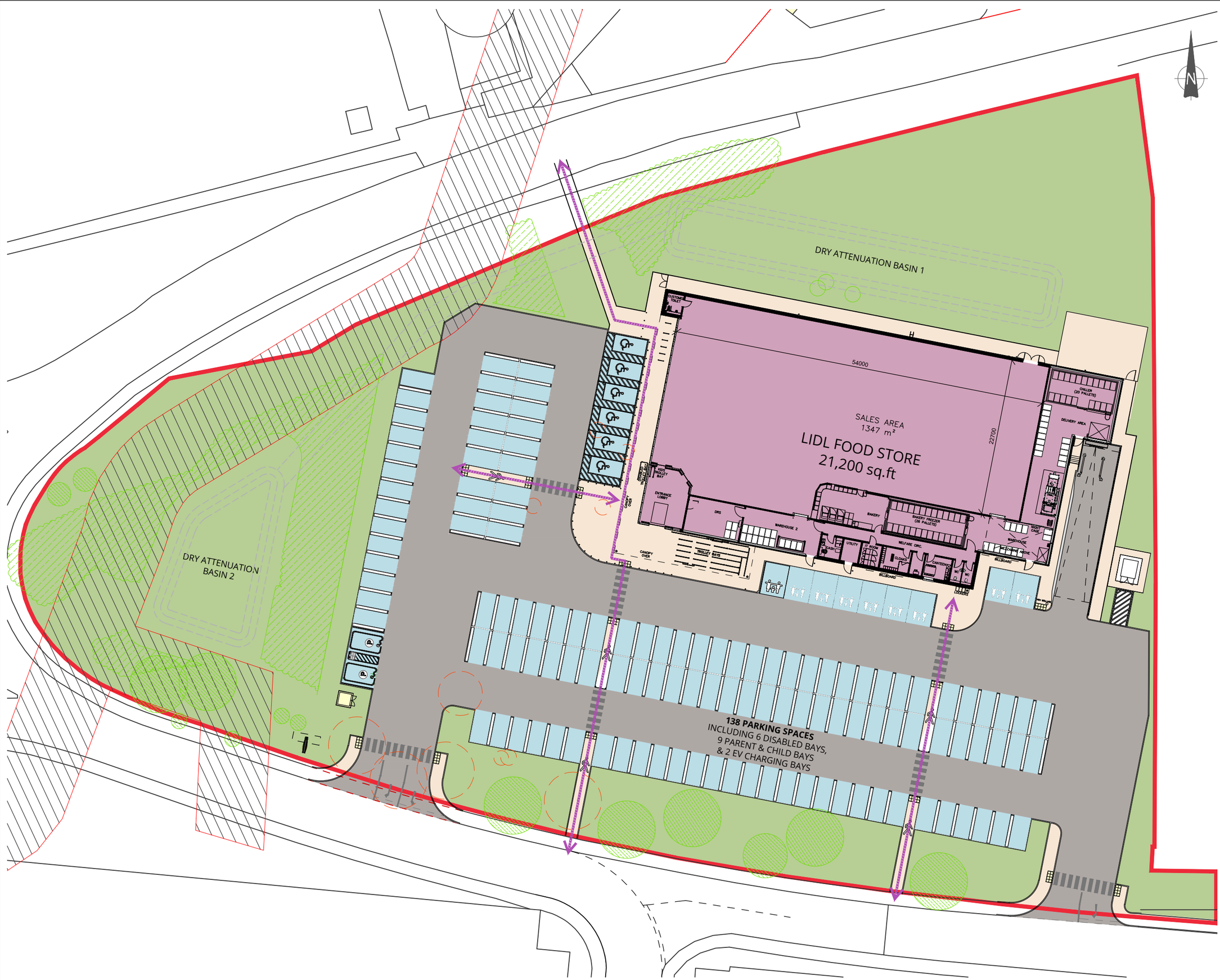
6.3 The noise surveys have shown that predicted levels for the plant, service yard activity, and car parking will have no significant adverse impact on the nearest residential properties from noise. In context, the proposal is within a busy commercial estate with large supermarkets in the vicinity. The proposal can operate without restrictions on delivery times or opening hours.

6.4 Noise from the plant and machinery noise emissions, can be controlled by way of planning condition where appropriate/necessary to meet appropriate criteria when assessed using BS 4142:2019 +A1.

6.5 The proposed development at Broughton Park can be developed to maintain a good noise climate for existing residents. It is therefore concluded that, noise from the proposal will not cause any significant adverse impacts on health and quality of life of future and existing residents in accordance with the policy aims of the Noise and Soundscape Plan for Wales, TAN 11, relevant standards and guidance and local policy.

APPENDIX A

SITE LAYOUT



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0m 5m 10m 20m 30m 40m 50m
0m 10mm 20mm 40mm 60mm 80mm 100mm

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DRAWING TO BE READ IN COLOUR

DRAFT

Rev No	Description	Drawn By	Date

URBAN EDGE
architecture / landscape / masterplanning

Client
BRITISH LAND COMPANY PLC

Project
NORTHERN QUARTER
BROUGHTON SHOPPING CENTRE
CHESTER

Drawing
SITE PLAN
AS PROPOSED
OPTION 6

Issue Purpose
FEASIBILITY

UE Proj No	Scale	Date	Drawn	Status	Revision
2921	1:500@A3	AUG 25	AS	-	P00b

Project - Organisation - Volume/System - Level - Type - Role - Number
2921-URB-NQ-00-DR-A-103156

APPENDIX B

ACOUSTIC TERMINOLOGY

Appendix B: Guide to Acoustic Terminology

Ambient noise:

The totally encompassing sound in a given situation at a given time. Most often described in terms of the index L_{AeqT}.

Atmospheric absorption:

The excess acoustic attenuation, over and above that caused by distance attenuation, due to the interaction of an acoustic wave with air molecules.

A-weighting:

A frequency weighting which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Units may be denoted as dB(A) or as sound pressure levels L_{pA} in dB. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound.

Background noise:

See $L_{A90.}$

Decibel (dB):

A unit of level 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 only perceptible under controlled conditions.

Façade noise level:

The noise level adjacent to the façade of a building, usually at a distance of 1 metre.

Free-field noise level:

The noise level away from the façade of a building or other structure.

Hertz (Hz):

Unit of frequency, equal to one cycle per second. Frequency is related to the pitch of a sound.

L_{A10T}: The A weighted level of noise exceeded for 10% of the specified measurement period, T. It gives an indication of the upper limit of fluctuating noise such as that from road traffic. $L_{A10,18hr}$ is the arithmetic average of the 18 hourly $L_{A10,1hr}$ values from 0600 hrs to 2400 hrs.

L_{A90T}: The A weighted noise level exceeded for 90% of the specified time period, T. In BS 4142: 2014 it is used to define background noise level.

L_{AeqT}: 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. This period is taken to be 16 hours (0700 hrs to 2300 hrs) and 8 hours (2300 to 0700 hrs) to describe day and night, L_{Aeqt} is used to describe many types of noise and can be measured directly with an integrating sound level meter.

SEL or L_{AE}: The sound exposure level is the A-weighted sound energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparisons to be made between different noise events which occur for different lengths of time.