

ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 3711

05 June 2024

Aldi Stores Ltd.
Shardlow
DERBY
DE72 2HP

ALDI CHEADLE
ENVIRONMENTAL NOISE IMPACT ASSESSMENT
ACOUSTIC CONSULTANCY REPORT ADT 3711/ENIA

Revision	Date	Issued By	Checked by	Revision Notes
-	31 May 2024	Leo Oikawa	Chris Middleton	first issue
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1.0 SUMMARY

Planning permission SMD/2022/0244 has been granted to redevelop the site to construct an Aldi store with associated access, car parking and landscaping as indicated on the application drawings.

Condition 22 requires the submission of details relating to the noise emissions from fixed plant, with a requirement to achieve BS 4142:2014+A1:2019 rating levels not exceeding background sound levels of 46 dB L_{A90} during the day and 36 dB L_{A90} overnight at adjoining noise sensitive locations.

Based on the manufacturers' data for the currently proposed plant, as shown on the Wave Refrigeration drawing 79-E1856-WAVE-XX-00-DR-R-En_60_60_00-0001 (Revision P01, issued 10 April 2024), BS 4142:2014+A1:2019 rating levels have been calculated at the nearest noise sensitive properties.

The rating levels are at least 25 dB below the otherwise prevailing background sound levels at the noise sensitive locations, by virtue of the distances and the significant acoustic screening provided by the intervening buildings.

On that basis, it is reasonable to conclude that the new plant layout is acoustically suitable and is compliant with the requirements of planning condition 22.

2.0 BASIS OF ASSESSMENT

2.1 Site Location

The site is located at the junction between Brookhouse Way and the A521 / The Green in Cheadle, Staffordshire. The site was previously occupied by the IAE factory and accommodated a large car parking area. To the south and west are several large industrial buildings occupied by Wheel 'N' Tyres, Roy Howell, Vulcan and Chell.

Immediately north of the site is a bungalow and a two storey house. Further afield, a petrol station and several two-storey residential buildings are on the other side of the A521. To the east, on the other side of Brookhouse Way, is a large residential area made up of two-storey houses. The closest main road is the A521, which forms the northern boundary and runs through the middle of Cheadle.

2.2 Proposed Development

Planning permission SMD/2022/0244 has been granted to redevelop the site and construct an Aldi store with associated access, car parking, and landscaping, as indicated on the application drawings.

2.3 Assessment Criteria

Planning Condition 22 refers to noise from fixed plant and reads as follows:

The machinery, plant or equipment including installed or operated in connection with the carrying out of this permission shall be so enclosed and/or attenuated that the rating level of noise generated by the operation of the machinery shall not increase the background noise levels during day time expressed as 46dB LA90 [1hour] (day time 07:00-23:00 hours) and/or 36dB LA90 [15 mins] during night time (night time 23:00-07:00 hours) at any adjoining noise sensitive locations or premises in separate occupation above that prevailing when the machinery is not operating. Noise measurements for the purpose of this condition shall be pursuant to BS 4142:2014+A1:2019.

The details and location of any plant or machinery to be installed under this permission should be submitted to and approved in writing by the Local Planning Authority.

2.4 Nearest Noise Sensitive Properties

The noise sensitive properties in the surrounding area have been grouped into two noise sensitive areas (NSA), as described below and as indicated on the attached site plan 3711/SP1.

NSA	Location	Direction	Approximate distance from proposed building (metres)
1	Houses 77 and 79 The Green	North	55
2	Houses on Greenways	North East	100

The above NSA represent the closest noise sensitive properties, with others located further from the site and in some cases screened by the intervening buildings. A satisfactory noise impact at the defined NSA should therefore ensure a satisfactory noise impact at other noise sensitive areas.

3.0 NOISE IMPACT ASSESSMENT

3.1 Introduction

As already mentioned in Section 2.3 above, the planning condition imposed by Staffordshire Moorlands District Council requires that noise emissions from the new plant installations are controlled following the guidance of BS 4142:2014+A1:2019.

The standard provides a methodology for assessing the likely impact of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The assessment involves comparing the *rating* level of the sound source with the typical *background* levels for the period of interest. The standard concludes that if the rating level does not exceed the background levels, the noise impact should be low, depending on the context.

Please refer to Appendix A for an explanation of the technical terms defined in the Standard.

3.2 Specific Sound Level

3.2.1 Computer Model

As the analysis is relatively complex, a computer model of the proposed installation has been constructed using Datakustik Cadna/A 2023 to predict how the sound will radiate from the proposed plant area to the nearest noise sensitive properties.

Within the model all buildings, including the supermarket and the 2 metre high solid boundary fence have been assumed to be acoustically reflective, with ground absorption taken into account as appropriate. The receiver height has been assumed to be 4.5 metres - the approximate height of the residential windows.

3.2.2 Source Sound Levels

The proposed plant and locations are shown on the separately issued Wave drawing 79-E1856-WAVE-XX-00-DR-R-En_60_60_00-0001 (Revision P01, issued 10 April 2024).

It is worth noting that the plant will be located at the south end of the site, with lines of sight to both of the nearby noise sensitive areas completely blocked by the bulk of the supermarket building.

The manufacturer's noise data for the proposed plant is as follows:

	Type	63	125	250	500	1k	2k	4k	8k	A-wt
Clade refrigeration pack	L _p at 1m	43	43	46	39	51	36	34	28	52
Clade gas cooler	L _w	63	63	62	62	60	53	47	47	64
Panasonic freezer condenser unit	L _p at 10m									36
Panasonic chiller condensing unit	L _p at 10m									33
Arotherm plus 12kW ASHP (3 no.)	L _w	52	52	54	56	54	52	53	47	60

Please note that no octave band data is available from Panasonic for the freezer and chiller condensing units.

3.3 Predicted Sound Levels

The plant noise levels as described in Section 3.2.2 above, have been input into the Cadna/A 2023 computer model to predict the noise levels at the identified noise sensitive areas, as follows:-

Location	Predicted $L_{eq,T}$ (dB) at octave band centre frequency (Hz)								$L_{Aeq,T}$ dB
	63	125	250	500	1k	2k	4k	8k	
NSA 1 - Houses 77 and 79 The Green	11	6	2	-4	-6	-10	-15	-30	0
NSA 2 - Houses on Greenways	11	7	6	-1	6	-1	-8	-31	8

3.4 Background Sound Level

The background sound levels are described in planning condition 22, during the daytime the background level is 46 dB $L_{A90,1\text{hours}}$ and during the night the level is 36 dB $L_{A90,15\text{mins}}$.

3.5 Rating Level

To convert the specific sound level into a rating level, corrections have to be applied for impulsivity, intermittency, tonality and other sound characteristics where such features are present.

3.5.1 Tonality

Using commonly accepted definitions of tonality, the predicted specific sound level at NSA 2 is technically tonal at 1kHz, but as the specific sound level is at least 28 dB below the background level and therefore inaudible, it is reasonable to conclude that this tonality would not be noticeable at the assessment location.

3.5.2 Impulsivity

The noise emissions from the condenser units should not be impulsive in character, so no correction is required.

3.5.3 Other Sound Characteristics

There are no additional sound characteristics which would warrant the addition of an extra correction.

3.5.4 Intermittency

As the plant operation is dependent on internal conditions, periods of operation may be intermittent. As such, a correction of +3 dB has been applied.

Applying the correction for intermittency and tonality to the specific sound level, the predicted rating levels are, therefore 3 dB $L_{Ar,T}$ at Nos. 77 and 79 The Green (NSA1) and 11 dB $L_{Ar,T}$ at the houses on Greenways (NSA2).

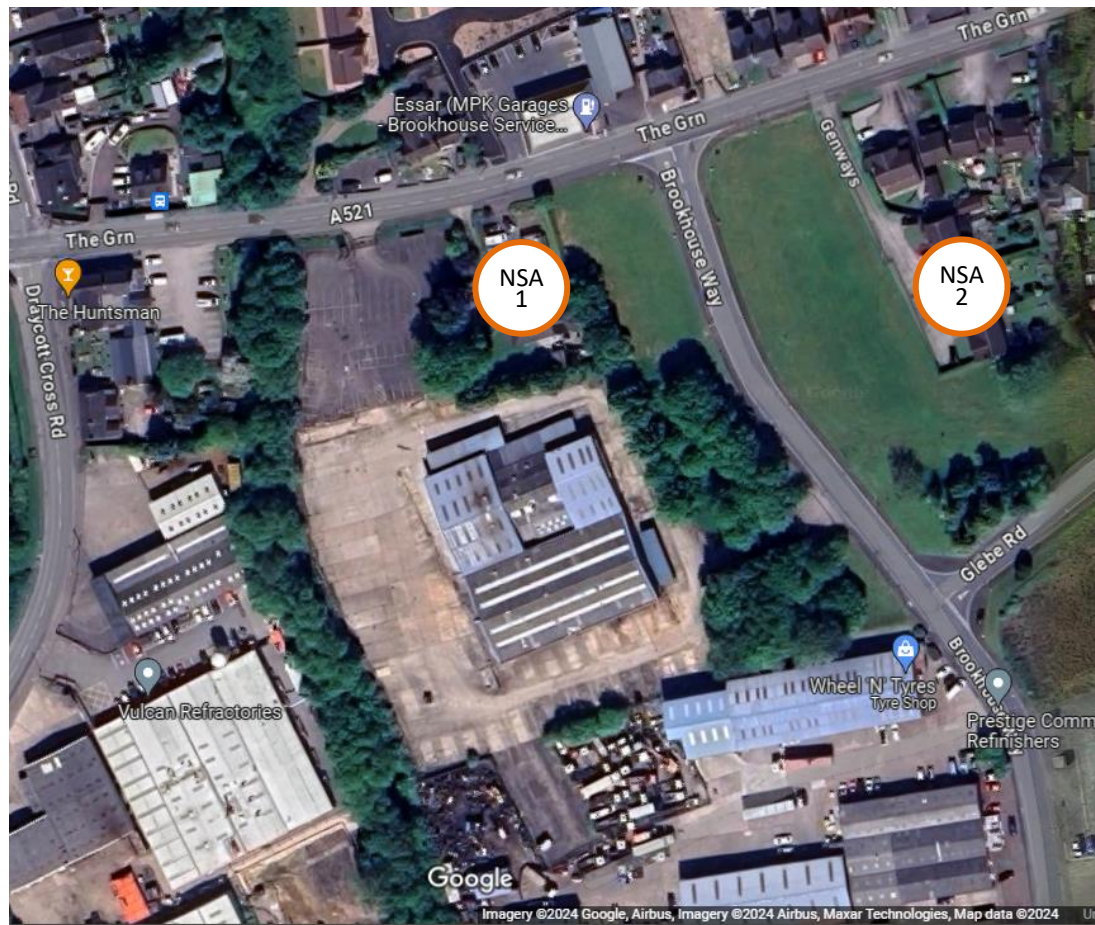
3.6 Assessment of Impact

A comparison of the rating levels in Section 3.5 above with the background noise levels in Section 3.4 above reveals that the rating levels are at least 25 dB below the background sound levels.

This is compliant with the requirements of planning condition 22.

A handwritten signature in black ink, reading "Leo Chikawa". The signature is written in a cursive, flowing style.

FOR ACOUSTIC DESIGN TECHNOLOGY



Notes

Description

Site Plan Showing Noise Sensitive Areas

Project

Aldi Cheadle

Date

05 June 2024

Drawing No.

3711/SP1



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APPENDIX A
Definitions from BS 4142 : 2014

reference time interval, T_r

specified interval over which the specific sound level is determined (1 h during the day, and 15 min during the night)

specific sound level, $L_{Aeq,Tr}$

equivalent continuous A-weighted sound pressure level produced by the specific source at the assessment position produced over a given reference time interval, T_r

rating level, $L_{At,Tr}$

specific sound level plus any adjustment for the characteristic features of the sound

background noise level, $L_{A90,T}$

see Appendix A