



Reference: Retail Unit, Plas Coch Retail Park,
Wrexham **Project No:** 2221351

Technical note

Preliminary plant noise assessment

Introduction

- Sharps Redmore (SR) have been instructed to carry out an assessment of plant noise associated with the proposed retail store, based on the preliminary plant selection.
- The proposed retail unit is approximately 150 metres from the closest residential properties to the north of the retail park. Ordinarily this distance separation would mean that the site is not particularly noise sensitive, however the site is subject to a stringent planning condition in relation to noise from fixed plant equipment.
- Planning condition 8 of planning permission P/2022/0252 controls plant noise levels from the Plas Coch Retail Park, Wrexham. Planning condition 8 states *“Plant or equipment serving the development should be located and designed so that no increase in background noise levels occurs at the boundary of adjoining residential properties”*.
- SR is in receipt of a noise assessment report prepared by Tetra Tech (report reference 784-B038288, dated April 2022) that was prepared to assess the noise impact of a proposal to extend the permitted servicing hours at retail unit H. The Tetra Tech (TT) noise report provides summary results of a noise survey undertaken in the vicinity of the retail park/proposed store.
- The TT noise survey summary indicates background noise levels of 48 dB L_{A90} daytime and 33 dB L_{A90} at night. SR has requested to review the complete noise survey data from TT to confirm the background noise levels.
- In order to comply with the requirements of planning condition 8 plant noise levels should not exceed a level 10 dB below the background noise climate. This results in plant noise limits at the closest residential properties of 38 dB daytime and 23 dB at night. SR consider the night time plant noise level limit to be stringent to achieve and will require mitigation works.
- The purpose of this preliminary assessment is to provide the Client with an indication as to the likely plant noise mitigation measures to ensure compliance with the requirement of planning condition 8; this includes the selection of intrinsically quiet plant, the use of atmospheric side attenuators and localised screening.

Head Office

Sharps Redmore The White House, London Road, Copdock, Ipswich, IP8 3JH

T 01473 730073 **E** contact@sharpsredmore.co.uk **W** sharpsredmore.co.uk

Regional Locations South England (Head Office), North England, Wales, Scotland

Sharps Redmore Partnership Limited Registered in England No. 2593855

Directors RD Sullivan BA(Hons), PhD, CEng, MIOA, MAAS, MASA; KJ Metcalfe BSc(Hons), MIOA; N Durup BSc(Hons), MSc, PhD, CEng, FIOA, MInstP, MASA, MAES; GJ King MIOA, MCIEH

Company Consultant TL Redmore BEng, MSc, PhD, MIOA

- Once final plant equipment selections have been made, further plant noise predictions should be undertaken to ensure compliance with planning condition 8.

Preliminary plant noise assessment

- 1 SR has been informed that both refrigeration and ventilation plant equipment is to be required. For the purpose of this preliminary plant noise assessment it has been assumed that the refrigeration plant would operate all of the time, with the ventilation equipment (AHU) typically operating during the daytime only (0700-2300 hours), when the store is occupied.
- 2 This preliminary plant assessment is based on the following plant items and associated source noise levels.

TABLE 1: Plant equipment source noise levels

Description	Octave band (Hz) sound power/ pressure levels dB L _w /dB L _p								
	L _w /L _p	63	125	250	500	1K	2K	4K	8K
VRF condenser	L _p	73 dBA at 1 metre							
Refrigeration pack housing	L _p	48 dBA at 10 metres							
Gas cooler	L _p	44 dBA at 10 metres							
Staff room AC unit	L _p	49 dBA at 1 metre							
Admin office AC unit	L _p	49 dBA at 1 metre							
AHU casing breakout	L _p	32 dBA at 10 metres							
AHU Fresh air intake	L _w	82	82	80	76	71	69	66	66
AHU exhaust	L _w	82	87	82	83	81	78	75	72

- 3 The full noise model (NoysPlot) files are included at Appendix A to this technical note and summarised below.

- 4 The following plant noise levels are predicted at the closest residential properties to the north of the proposed unit.

TABLE 2: Predicted plant noise levels

Noise sensitive receptor	Predicted plant noise level dB(A)	
	Daytime	Night time
34 Stansty Road	38	22
Stansty House care home	38	23
1 Stansty Close	37	21

- 5 The predicted noise levels in Table 2 are on the basis of the source noise levels in Table 1 above and a 3.5 metre high ('L' shaped) noise barrier around the VRF condenser unit, and on the assumption that the AHU exhaust discharges into the service yard between the units (facing east).
- 6 It is to be noted that our preliminary calculations indicate that additional attenuation is not needed for the AHU, but that given that the predicted daytime noise levels are right on the limit (in terms of compliance with planning condition 8), when the final selections are known and modelled, that attenuation may potentially be required.
- 7 As an option, should it not be possible to provide screening to the VRF condenser unit, then the reselection of the VRF condenser unit to be no more than 60 dBA at 1 metre would remove the need for the noise barrier, with resultant noise levels complying with the requirement of condition 8.
- 8 If SR can be supplied with the final plant selections when available and the baseline noise survey data from Tetra Tech, we will finalise our model and confirm mitigation requirements to ensure compliance with planning condition 8. My reading of planning condition 8 is that it is a compliance type condition rather than one that requires the submission of information to the local authority for approval.

Keith Metcalfe

6th September 2022

APPENDIX A

PLANT NOISE MODEL CALCULATIONS

[illegible]

Appendix C2: NoysPlot input data, source, receptor and barrier data

Sharps Redmore Partnership
The White House, London Road, Copdock, Ipswich, IP8 3JH

Filename: p:\19 - Projects\1918929 Aldi-ATS Abergavenny-KJM\NoysPlot\AJM 17.5.22\Option2\To Comply_4.5M FENCE_Complies with SR Limits
Date: 06 September 2022
Entries by: K J Metcalfe
Project no: 2221351
Project title: Wrexham
Client's name:

Map/plot details: Length: 3200
Width: 3200
Height: 250

Source data - description, co-ordinates, outlet size, percentage to atmosphere, directivity, sound levels and running period

Source description	Co-ordinates			Outlet details			%	Q	Run	Lp/	dBA	Dist	Noise level - Octave band centre frequency Hz							
	X m	Y m	Z m	Amm	Bmm	Ang.			d/n/a	Lw	Y/N	(m)	63	125	250	500	1k	2k	4k	8k
VRF Condenser	572.0	520.0	1.6	0	0	0	100	2	A	P	Y	1.0	73 dBA							
Gas Cooler	565.0	527.0	1.6	0	0	0	100	2	A	P	Y	10.0	38 dBA							
Compressor Pack	566.0	520.0	2.4	0	0	0	100	2	A	P	Y	10.0	38 dBA							
AC Unit 1	564.0	531.0	0.6	0	0	0	100	2	A	P	Y	1.0	49 dBA							
AC Unit 2	564.0	532.0	0.6	0	0	0	100	2	A	P	Y	1.0	49 dBA							
AHU Fresh Air Inlet	566.0	533.1	1.9	0	0	180	100	2	D	W	N	0.0	82	82	80	76	71	69	66	66
AHU Exhaust	567.0	534.0	1.9	0	0	90	100	2	D	W	N	0.0	82	87	82	83	81	78	75	72
AHU Supply Air Breakout	564.5	536.0	5.0	0	0	0	100	2	D	W	N	0.0	75	77	69	66	58	49	42	39
AHU Return Air Breakout	564.5	534.0	5.0	0	0	0	100	2	D	W	N	0.0	75	72	67	59	48	40	33	33

Receptor data - description and co-ordinates

Receptor description	Co-ordinates			DNA
	X m	Y m	Z m	
34 Stansty Road	506.0	679.0	4.5	A
1 Stansty Close	738.0	578.0	4.5	A
Stansty House Care Home	565.0	686.0	4.5	A

Barrier data - description and co-ordinates

Barrier description	Co-ordinates					
	Start			End		
	X m	Y m	Z m	X m	Y m	Z m
Ring Barrier	500.0	500.0	5.0	500.0	545.0	5.0
Ring Barrier	500.0	545.0	5.0	506.0	545.0	5.0
Ring Barrier	506.0	545.0	5.0	506.0	542.0	5.0
Ring Barrier	506.0	542.0	5.0	523.0	542.0	5.0
Ring Barrier	523.0	542.0	5.0	523.0	537.0	5.0
Ring Barrier	523.0	537.0	5.0	563.0	537.0	5.0
Ring Barrier	563.0	537.0	5.0	563.0	500.0	5.0
Ring Barrier	563.0	500.0	5.0	500.0	500.0	5.0
Finite Barrier	598.0	500.0	5.0	598.0	535.0	5.0
Finite Barrier	563.0	529.0	3.5	578.0	529.0	3.5
Finite Barrier	578.0	529.0	3.5	578.0	512.0	3.5

Appendix C3: Predicted daytime noise levels

Overall receptor listings

Period: Daytime

Overall plant noise levels (dB)	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Stansty House Care Home	44	40	36	35	32	30	27	24	38
34 Stansty Road	44	40	36	35	32	30	27	24	38
1 Stansty Close	43	39	35	34	31	29	26	23	37

Source noise levels at receiver: 34 Stansty Road

Period: Daytime

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
AHU Exhaust	33	38	33	34	32	29	26	23	37
AHU Fresh Air Inlet	33	33	31	27	22	20	17	17	29
VRF Condenser	43	32	23	15	9	6	3	3	22
AHU Supply Air Breakout	26	28	20	17	9	0	0	0	18
AHU Return Air Breakout	26	23	18	10	0	0	0	0	13
Gas Cooler	29	18	8	0	0	0	0	0	7
Compressor Pack	29	17	8	0	0	0	0	0	6
AC Unit 1	20	9	0	0	0	0	0	0	0
AC Unit 2	20	9	1	0	0	0	0	0	0
Total Free field Lp and dBA	44	40	36	35	32	30	27	24	38

Source noise levels at receiver: 1 Stansty Close

Period: Daytime

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
AHU Exhaust	32	37	32	33	31	28	25	22	36
AHU Fresh Air Inlet	32	32	30	26	21	19	16	16	28
VRF Condenser	41	30	21	12	7	3	1	3	20
AHU Supply Air Breakout	25	27	19	16	8	0	0	0	17
AHU Return Air Breakout	25	22	17	9	0	0	0	0	12
Compressor Pack	30	19	10	2	0	0	0	0	8
Gas Cooler	27	15	7	0	0	0	0	0	4
AC Unit 1	24	14	7	1	0	0	0	0	0
AC Unit 2	24	14	7	1	0	0	0	0	0
Total Free field Lp and dBA	43	39	35	34	31	29	26	23	37

Source noise levels at receiver: Stansty House Care Home

Period: Daytime

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
AHU Exhaust	33	38	33	34	32	29	26	23	37
AHU Fresh Air Inlet	33	33	31	27	22	20	17	17	29
VRF Condenser	43	32	23	15	10	6	3	4	22
AHU Supply Air Breakout	26	28	20	17	9	0	0	0	18
AHU Return Air Breakout	26	23	18	10	0	0	0	0	13
Compressor Pack	31	20	11	4	0	0	0	0	10
Gas Cooler	28	15	6	0	0	0	0	0	4
AC Unit 1	25	15	8	2	0	0	0	0	0
AC Unit 2	25	15	8	2	0	0	0	0	0
Total Free field Lp and dBA	44	40	36	35	32	30	27	24	38

Appendix C4: Predicted night time noise levels

Overall receptor listings

Period: Night time

Overall plant noise levels (dB)	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Stansty House Care Home	44	33	24	16	10	6	3	4	23
34 Stansty Road	43	32	23	15	9	6	3	3	22
1 Stansty Close	42	31	22	13	7	3	1	3	21

Source noise levels at receiver: 34 Stansty Road

Period: Daytime

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
VRF Condenser	43	32	23	15	9	6	3	3	22
Gas Cooler	29	18	8	0	0	0	0	0	7
Compressor Pack	29	17	8	0	0	0	0	0	6
AC Unit 1	20	9	0	0	0	0	0	0	0
AC Unit 2	20	9	1	0	0	0	0	0	0
Total Free field Lp and dBA	43	32	23	15	9	6	3	3	22

Source noise levels at receiver: 1 Stansty Close

Period: Daytime

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
VRF Condenser	41	30	21	12	7	3	1	3	20
Compressor Pack	30	19	10	2	0	0	0	0	8
Gas Cooler	27	15	7	0	0	0	0	0	4
AC Unit 1	24	14	7	1	0	0	0	0	0
AC Unit 2	24	14	7	1	0	0	0	0	0
Total Free field Lp and dBA	42	31	22	13	7	3	1	3	21

Source noise levels at receiver: Stansty House Care Home

Period: Daytime

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
VRF Condenser	43	32	23	15	10	6	3	4	22
Compressor Pack	31	20	11	4	0	0	0	0	10
Gas Cooler	28	15	6	0	0	0	0	0	4
AC Unit 1	25	15	8	2	0	0	0	0	0
AC Unit 2	25	15	8	2	0	0	0	0	0
Total Free field Lp and dBA	44	33	24	16	10	6	3	4	23