

SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report

**Aldi, London Road,
Gravesend**

Plant noise assessment

Prepared by
Mark Taylor MIOA

Date 31st October 2024
Project No 2422788

Head Office

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DISCLAIMER

This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

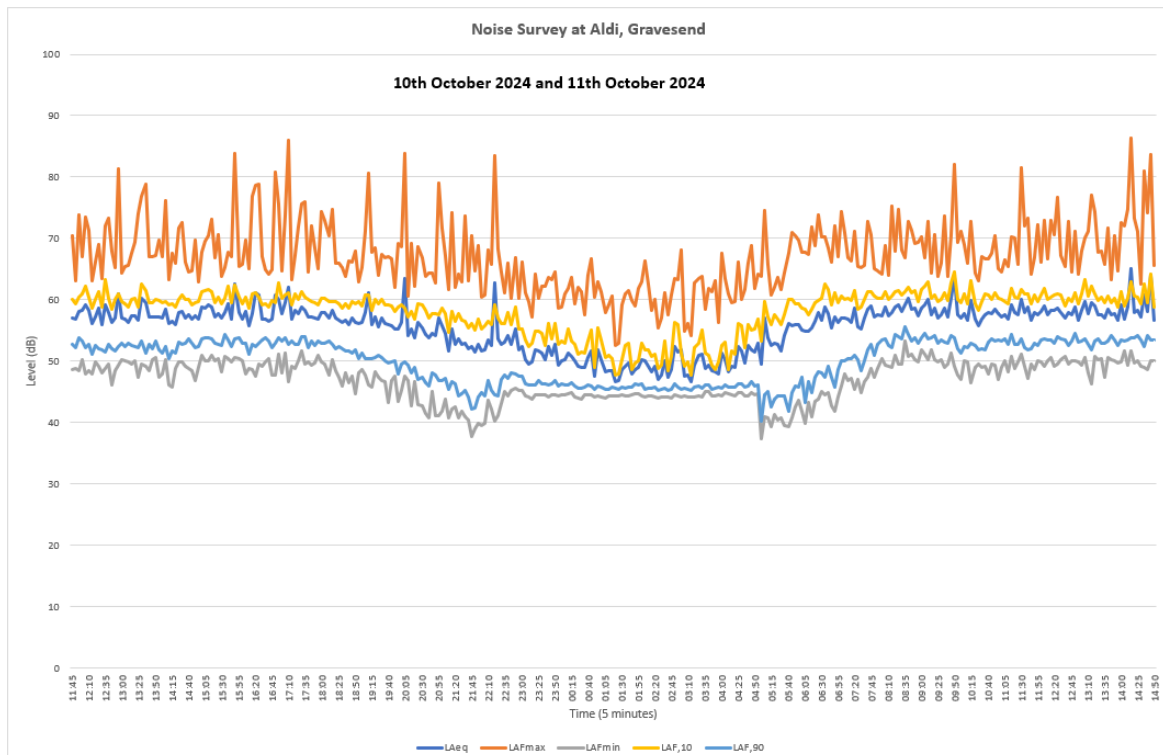
1.0 Introduction

- 1.1 Sharps Redmore (SR) has been instructed to undertake a noise assessment of the proposed replacement plant to serve the existing Aldi store on London Road, Gravesend.
- 1.2 The proposal is to install the replacement refrigeration plant at the rear of the store, with additional air source heat pumps (ASHP's) to be located in the current plant area at the rear of the loading bay.
- 1.3 The assessment criteria are presented at section 2.
- 1.4 An assessment of predicted plant noise levels is contained at section 3.
- 1.5 Details of the noise model methodology are presented in Section 4.
- 1.6 The site is located on London Road, Gravesend. The nearest residential properties to the proposed plant are located in London Road, Thames Way, Vauxhall Court, and St Marks Avenue.

2.0 Establishing criteria

- 2.1 It is usual in dealing with fixed sources of ventilation and refrigeration noise to use BS 4142:2014+A1:2019 “Method for rating and assessing industrial and commercial sound” as a means of establishing the potential impact from the new sources to the nearest residential properties.
- 2.2 A noise survey was undertaken at the site, between 10th and 11th October 2024, on the rear boundary of the store. The survey was undertaken using a Norsonic 140 Type 1 sound level meters, which was calibrated before and after the survey, with no sign of any drift. The sound level meter was set-up, to continually record noise levels at 5-minute intervals. All measurements were carried out in free-field conditions.
- 2.3 The weather was dry, with low wind speeds, as such would not have an adverse impact of the environmental noise survey.
- 2.4 A summary of the survey results are shown in Figure 1 below:

Figure 1: Environmental noise survey data



- 2.5 As can be seen from the survey data presented, there does appear to be an anomaly in the L_{A90} and L_{Amin} noise data between 2200 and 0500 hours. As the survey was unattended we cannot speculate what extraneous noise may have had an influence. However, based on the trend before and after these times, based on our experience, the background noise level is likely to be between 35 and 40 dB L_{A90} .
- 2.6 As part of a previous planning application for an extension to the store, Application Ref 20120967, an acoustic report was issued by Acoustic Consultancy Partnership Ltd, which included an environmental noise survey at various locations around the site, and established a minimum background noise level of 37 dB L_{A90} , against which consent was granted.
- 2.7 Based on the environmental noise survey undertaken by ourselves, and previously by others, the following background noise levels are considered to be representative of the noise climate at the nearest residential properties to the store:

Table 1: Typical background

Time	Typical background L_{A90}
Day (0700-2300) based on late evening	45 dB
Night (2300-0700)	37 dB

3.0 The fixed plant noise control scheme – conclusions and recommendations

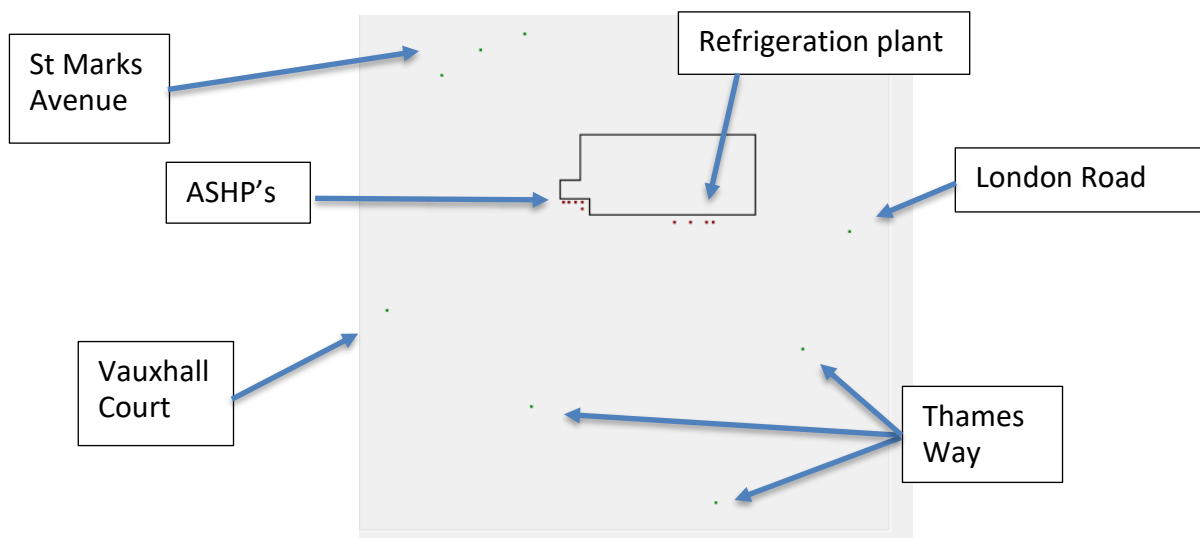
- 3.1 Based on the environmental noise model (see Section 5.0), the predicted noise levels without any additional mitigation are as follows:

Table 2 – Predicted noise levels at nearest residential properties from the proposed plant

Receptor location	Daytime 0700-2300			Night 2300-0700		
	Predicted L _{Aeq}	Background L _{A90}	Difference	Predicted L _{Aeq}	Background L _{A90}	Difference
London Road	36 dB	45 dB	-9	36 dB	37 dB	-1
Thames Way	36 dB	45 dB	-9	36 dB	37 dB	-1
Vauxhall Court	33 dB	45 dB	-12	33 dB	37 dB	-4
St Marks Avenue	21 dB	45 dB	-24	21 dB	37 dB	-16

- 3.2 A schedule of manufacturers noise data used for the proposed plant is shown in Appendix A.
- 3.3 The noise control system is based on the selection of intrinsically quiet equipment, distance from the plant to the receptors, and screening from the building itself.
- 3.4 Based on our experience, the type of plant proposed is neither tonal or impulsive in character, however the refrigeration plant may be intermittent, therefore a +3 dB character correction has been applied to the predicted noise levels in Table 2.
- 3.5 The predicted rating noise levels are significantly below the background noise climate during the day, and below the background noise climate at night. Based on the guidance in BS 4142:2014+A1:2019, where the rating level does not exceed the background noise climate, it is considered to be a low impact.
- 3.6 Detailed below is a sketch from the noise model detailing the location of the store, the plant, and the receptors:

Figure 2: Noise model source and receptor locations



4.0 The noise model and prediction methodology

4.1 The noise model employed has been written in-house to provide an accurate prediction method for assessing environmental noise from, in particular, plant and equipment items which can be perceived as being point sources. It has been mainly used for the prediction of noise emanating from superstores.

4.2 There are three input spreadsheets containing:

- noise sources data
- receiver data
- acoustic screening data

These are included in Appendix A.

4.3 The noise sources data include one of the following forms for each item of plant:

- either, octave band sound power levels in the range of 63 to 8000Hz – this being available from manufacturer of many of the supply and extract fans.
- or, octave band sound pressure levels in the range of 63 to 8000Hz – this is available usually for the small, externally mounted split units' condenser fans from the manufacturer's product catalogue when measured at one metre in anechoic conditions, thus allowing straight forward calculation of the equivalent sound power levels.
- or, single value sound pressure levels at a stated distance

4.4 The relative location of the plant using X and Y co-ordinates with an arbitrary datum point and a Z (height) co-ordinate based on supporting steel and screening heights from the main contractor and then the equipment heights based, in this case, on the mechanical services contractor drawings.

4.5 Where known, the area and orientation of the noise outlet is entered together with its location adjacent to either one, two or three reflective surfaces so that the calculation can establish the directivity pattern and outlet reflection losses.

4.6 The receiver data needed are the X, Y and Z co-ordinates so that the relative distance and angle can be calculated between the source and the receiver.

4.7 Finally, several types of acoustic screening may be entered. In this case, this is designated "R" meaning a ring barrier indicating the building itself.

4.8 The noise model carries out "text book" atmospheric side calculations at each receiver position from each source allowing for the attenuation from such as the calculated distance and screening. The calculations are performed in eight Octave bands from 63 to 8000Hz but can then be summarised as dBA, NR or NC for convenience. In this case, the overall summary levels are in dBA. Calculations for the plant are included in Appendix C. The computer maintains a logarithmic total of the noise levels in Octave bands.

- 4.9 At the end of each program “run”, the overall day or night time noise level at each receiver position are calculated and ranked in descending order of noise level. Where this ranking shows that the receiver position’s noise level exceeds the noise criterion, each calculation can be interrogated to determine the plant items needing more detailed inspection to establish the attenuation needed. The process is repeated until either the noise level meets the noise criterion or the program demonstrates that other noise control methods are needed. This may take the form of restricting the offending plant’s period of operation or improving the screening or re-selection to give quieter plant.
- 4.10 Plant noise predictions are shown in summary form; full calculations of noise from each source to each receptor are available on request.

5.0 Assessment conclusions

- 5.1 This assessment has been undertaken in accordance with the guidelines in BS 4142:2014+A1:2109.
- 5.2 Whilst there is some uncertainty regarding the recent night time noise survey data, to ensure a robust approach, environmental noise survey data issued to discharge Condition 5 of planning application 20120967 has also been used.
- 5.3 The predicted rating noise levels are significantly below the background noise climate during the day, and below the background noise climate at night. Based on the guidance in BS 4142:2014+A1:2019, where the rating level does not exceed the background noise climate, it is considered to be a low impact.
- 5.4 This assessment therefore objectively demonstrates that noise arising from the fixed plant, complies with the requirement of paragraph 191 of the NPPF to avoid significant adverse impact.

APPENDIX A

NOISE SOURCE DATA

CLIENT :Aldi			A Sht: 1 of 1									
PROJECT :Gravesend			PROJECT No:2422788									
CONSULTANT:MT			DATE :01 November 2024									
SOUND POWER LEVELS (Lw) & SOUND PRESSURE LEVELS (Lp) FOR FANS AND OTHER EQUIPMENT												
EQUIPMENT NAME/REFERENCE	Lw/Lp	DIST. (m)	OP. TIME DNA	MID FREQUENCY OCTAVE BANDS (HZ)								
				63	125	250	500	1k	2k	4k	8k	
ASHP	Lp	5	A	Maximum 38dBA at 5 metres								
ASHP	Lp	5	A	Maximum 38dBA at 5 metres								
ASHP	Lp	5	A	Maximum 38dBA at 5 metres								
ASHP	Lp	5	A	Maximum 38dBA at 5 metres								
ASHP	Lp	5	A	Maximum 38dBA at 5 metres								
Gas cooler	Lp	10	A	Maximum 43dBA at 10 metres								
Refrigeration pack	Lp	10	A	Maximum 35dBA at 10 metres								
LT CU	Lp	10	A	Maximum 33dBA at 10 metres								
HT CU	Lp	10	A	Maximum 36dBA at 10 metres								
NOTES: 1. Lw/Lp: Lw means sound power level (dB) Lp means sound pressure level at stated distance (dB/m) 2. Operational time (OP.TIME D/N/A): D (Day) - could operate at any time between 0700 & 2300 N (Night) - could operate at any time between 2300 & 0700 A (All) - could operate at any time during the day and night												

APPENDIX B

NOISE MODEL INPUT DATA

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Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Filename : p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1
Date : 01 November 2024
Entries by : MT
Project number : 2422788
Project title : Gravesend
Client's name : Aldi

Map/plot details :

Length :3200
Width :3200
Height :250

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Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

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

Filename : p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Source Description	Coordinates			Outlet details			Run Lp/ dBA Dist.			Mid frequency octave bands									
	X(m)	Y(m)	Z(m)	A(mm)	B(mm)	Ang. %	Q	DNA	Lw	Y/N	(m)	63	125	250	500	1k	2k	4k	8k
ASHP	140.0	204.0	1.5	0	0	0	100	2	A	P	Y	5.0	38	0	0	0	0	0	0
ASHP	142.0	204.0	1.5	0	0	0	100	2	A	P	Y	5.0	38	0	0	0	0	0	0
ASHP	144.0	204.0	1.5	0	0	0	100	2	A	P	Y	5.0	38	0	0	0	0	0	0
ASHP	146.0	204.0	1.5	0	0	0	100	2	A	P	Y	5.0	38	0	0	0	0	0	0
ASHP	146.0	202.0	1.5	0	0	0	100	2	A	P	Y	5.0	38	0	0	0	0	0	0
Gas cooler	175.0	198.0	1.5	0	0	0	100	2	A	P	Y	10.0	43	0	0	0	0	0	0
Refrigeration pack	180.0	198.0	2.6	0	0	0	100	2	A	P	Y	10.0	35	0	0	0	0	0	0
LT CU	185.0	198.0	1.0	0	0	0	100	2	A	P	Y	10.0	33	0	0	0	0	0	0
HT CU	187.0	198.0	1.0	0	0	0	100	2	A	P	Y	10.0	36	0	0	0	0	0	0

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Receptor data - description and coordinates

Filename : p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Receptor Description	Coordinates			DNA
	X(m)	Y(m)	Z(m)	
London Road	230.0	195.0	7.5	A
Thames Way	215.0	158.0	4.5	A
Thames Way	188.0	110.0	4.5	A
Thames Way	130.0	140.0	7.5	A
Vauxhall Court	85.0	170.0	7.5	A
St Marks Avenue	102.0	244.0	4.5	A
St Marks Avenue	114.0	252.0	4.5	A
St Marks Avenue	128.0	257.0	4.5	A

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Barrier data - description and coordinates

Filename : p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Barrier type	Start		Coordinates			Finish	
	X(m)	Y(m)	Z(m)	X(m)	Y(m)	Z(m)	
R	200.0	200.0	5.0	148.0	200.0	5.0	
R	148.0	200.0	5.0	148.0	205.0	5.0	
R	148.0	205.0	5.0	139.0	205.0	5.0	
R	139.0	205.0	5.0	139.0	211.0	5.0	
R	139.0	211.0	5.0	145.0	211.0	5.0	
R	145.0	211.0	5.0	145.0	225.0	5.0	
R	145.0	225.0	5.0	200.0	225.0	5.0	
R	200.0	225.0	5.0	200.0	200.0	5.0	

APPENDIX C

PREDICTED NOISE LEVELS - SUMMARY

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH
Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time overall receptor listings

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1
Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
London Road	50	40	33	27	24	23	23	25	33
Thames Way	50	40	33	27	24	23	23	25	33
Thames Way	49	39	32	26	23	22	22	24	32
Vauxhall Court	47	37	30	24	21	20	20	22	30
Thames Way	46	36	29	23	20	19	19	21	29
St Marks Avenue	39	27	18	10	6	5	5	7	18
St Marks Avenue	39	27	17	8	1	0	0	0	16
St Marks Avenue	38	26	16	5	0	0	0	0	15

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Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: London Road

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	48	38	31	25	22	21	21	23	31
HT CU	43	33	26	20	17	16	16	18	26
Refrigeration pack	41	31	24	18	15	14	14	16	24
LT CU	40	30	23	17	14	13	13	15	23
ASHP	27	15	6	0	0	0	0	0	4
ASHP	25	13	3	0	0	0	0	0	0
ASHP	26	14	5	0	0	0	0	0	0
ASHP	26	13	4	0	0	0	0	0	0
ASHP	24	11	1	0	0	0	0	0	0
Total Free field Lp and dBA	50	40	33	27	24	23	23	25	33

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 Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Thames Way

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1
 Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	48	38	31	25	22	21	21	23	31
HT CU	42	32	25	19	16	15	15	17	25
Refrigeration pack	40	30	23	17	14	13	13	15	23
LT CU	39	29	22	16	13	12	12	14	22
ASHP	33	23	16	10	7	6	6	8	16
ASHP	23	10	1	0	0	0	0	0	0
ASHP	24	11	2	0	0	0	0	0	0
ASHP	22	9	0	0	0	0	0	0	0
ASHP	22	9	0	0	0	0	0	0	0
Total Free field Lp and dBA	50	40	33	27	24	23	23	25	33

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Night-time source sound pressure levels at receptor: Thames Way

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	44	34	27	21	18	17	17	19	27
HT CU	37	27	20	14	11	10	10	12	20
Refrigeration pack	36	26	19	13	10	9	9	11	19
LT CU	34	24	17	11	8	7	7	9	17
ASHP	32	22	15	9	6	5	5	7	15
ASHP	32	22	15	9	6	5	5	7	15
ASHP	32	22	15	9	6	5	5	7	15
ASHP	32	22	15	9	6	5	5	7	15
ASHP	32	22	15	9	6	5	5	7	15
Total Free field Lp and dBA	46	36	29	23	20	19	19	21	29

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Night-time source sound pressure levels at receptor: Thames Way

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	46	36	29	23	20	19	19	21	29
HT CU	38	28	21	15	12	11	11	13	21
Refrigeration pack	37	27	20	14	11	10	10	12	20
ASHP	36	26	19	13	10	9	9	11	19
ASHP	36	26	19	13	10	9	9	11	19
ASHP	36	26	19	13	10	9	9	11	19
ASHP	36	26	19	13	10	9	9	11	19
ASHP	36	26	19	13	10	9	9	11	19
LT CU	35	25	18	12	9	8	8	10	18
Total Free field Lp and dBA	49	39	32	26	23	22	22	24	32

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Night-time source sound pressure levels at receptor: Vauxhall Court

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1
 Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	43	33	26	20	17	16	16	18	26
ASHP	36	26	19	13	10	9	9	11	19
ASHP	36	26	19	13	10	9	9	11	19
HT CU	35	25	18	12	9	8	8	10	18
ASHP	35	25	18	12	9	8	8	10	18
ASHP	35	25	18	12	9	8	8	10	18
Refrigeration pack	35	25	18	12	9	8	8	10	18
ASHP	35	25	18	12	9	8	8	10	18
LT CU	33	23	16	10	7	6	6	8	16
Total Free field Lp and dBA	47	37	30	24	21	20	20	22	30

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Night-time source sound pressure levels at receptor: St Marks Avenue

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
ASHP	33	23	15	9	6	5	5	7	15
Gas cooler	34	22	12	3	0	0	0	0	11
ASHP	31	19	9	1	0	0	0	0	8
Refrigeration pack	28	16	6	0	0	0	0	0	4
HT CU	26	13	3	0	0	0	0	0	0
ASHP	24	11	2	0	0	0	0	0	0
ASHP	25	13	3	0	0	0	0	0	0
ASHP	24	11	2	0	0	0	0	0	0
LT CU	23	10	0	0	0	0	0	0	0
Total Free field Lp and dBA	39	27	18	10	6	5	5	7	18

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Night-time source sound pressure levels at receptor: St Marks Avenue

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
ASHP	32	22	13	6	1	0	0	0	12
Gas cooler	34	22	12	3	0	0	0	0	11
ASHP	29	17	7	0	0	0	0	0	6
ASHP	29	16	7	0	0	0	0	0	5
Refrigeration pack	27	15	5	0	0	0	0	0	4
ASHP	27	15	5	0	0	0	0	0	4
HT CU	26	13	3	0	0	0	0	0	0
ASHP	24	11	1	0	0	0	0	0	0
LT CU	23	10	0	0	0	0	0	0	0
Total Free field Lp and dBA	39	27	17	8	1	0	0	0	16

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Night-time source sound pressure levels at receptor: St Marks Avenue

Filename: p:\24 - Projects\2422788 Aldi Gravesend-MOT\Noysplot\311024_1

Date: 01/11/2024

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	34	21	11	2	0	0	0	0	11
ASHP	31	20	11	2	0	0	0	0	9
ASHP	28	15	5	0	0	0	0	0	4
ASHP	28	15	5	0	0	0	0	0	4
Refrigeration pack	28	15	6	0	0	0	0	0	4
ASHP	26	14	4	0	0	0	0	0	0
HT CU	26	14	4	0	0	0	0	0	0
ASHP	26	13	3	0	0	0	0	0	0
LT CU	23	11	1	0	0	0	0	0	0
Total Free field Lp and dBA	38	26	16	5	0	0	0	0	15