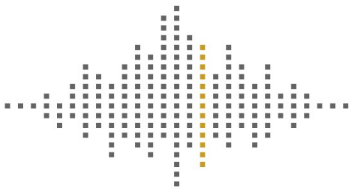


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SHARPS REDMORE
ACOUSTIC CONSULTANTS ▪ Established 1990



Report

**Aldi Burrows Yard, Afan
Way, Port Talbot,**

Assessment of noise from
proposed fixed plant
equipment to seek discharge
of planning condition 9 of
planning permission
P2024/0339

Prepared by
A J Metcalfe BA (Hons). AMIOA

Date 25th June 2025
Project No: 2321696

Head Office
Sharps Redmore
The White House, London Road,
Copdock, Ipswich, IP8 3JH
T 01473 730073
E contact@sharpsredmore.com
W sharpsredmore.com

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



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Contents

- 1.0 Introduction
- 2.0 Fixed plant noise assessment
- 3.0 Assessment conclusions

Appendices

- A. Site layout
- B. Plant details
- C. Plant noise calculations
- D. Acoustic terminology

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 to any third party who relies upon its content, recommendations or conclusions. The contents of this report should be reviewed by other disciplines to confirm that it is appropriate for their design responsibilities.

Superseded

1.0 Introduction

- 1.1 Sharps Redmore (SR) has been instructed to undertake a noise assessment to seek the discharge of planning condition 9 of planning permission of P2024/0339 relating to noise from fixed plant equipment at the consented Aldi store at Burrows Yard, Afan Way, Port Talbot. Planning condition 9 states:

“9 No fixed plant and/or machinery shall be brought into beneficial operation until details of the fixed plant and machinery serving the development hereby permitted, and any mitigation measures to achieve this condition, are submitted to and approved in writing by the local planning authority. The rating level of the plant sound emitted from the site shall not exceed 42 dBA between 0700 hours to 2300 hours and 39 dBA at all other times. The sound levels shall be determined by measurement or calculation at the nearest noise sensitive premises. The measurements and assessment shall be made according to BS 4142:2014+A1:2019. The fixed plant and machinery on-site shall thereafter be operated in accordance with the approved details.

Reason: To protect the amenity of the locality, especially for people living and/or working nearby, in accordance with Policy EN8 and BE1 of the Neath Port Talbot County Borough Council Local Development Plan (2011-2026) Adopted January 2016.”

- 1.2 The nearest residential properties to the plant area would be those houses to the west of the Aldi site at Borough Street, Isaac’s Place and Enfield Street, and to the north on Ysguthan Road. The site layout is shown at Appendix A, and the proposed plant layout plan is included at Appendix B.
- 1.3 Section 2 of this report presents details of the noise modelling undertaken and assesses the plant in the context of the requirements of planning condition 9. Section 3 of this report contains the assessment conclusions.

Superseded

2.0 Fixed plant noise assessment

- 2.1 In order to determine plant noise levels at the closest residential receptors, noise modelling software was used.
- 2.2 SR use a noise modelling software package called 'NoysPlot'. This software enables coordinates to be entered for the relative positions of noise sources, receivers and barriers to calculate a resultant noise level at a given receptor. The software carries out 'textbook' atmospheric side calculations with regard to distance and screening attenuation by referencing relative
- 2.3 The height coordinates used in the 'NoysPlot' model have been extrapolated from the site drawings and observations. The horizontal coordinates are referenced from an arbitrary 'x', 'y' position on a grid system.
- 2.4 The software considers these noise sources which are detailed in the noise source input schedule in Appendix C1. From the manufacturers noise level data that has been supplied and experience of this equipment once installed, there is no indication that the plant has any tonal component. However, the refrigeration plant may operate intermittently and therefore within the plant calculations the operating duty of the refrigeration plant and ASHPs has been increased to 200% (to allow for a 3 dB feature correction for intermittent operation in accordance with BS 4142 to be applied).
- 2.5 NoysPlot uses operating time information to calculate noise levels for daytime and nighttime operation. The time period that the equipment is assumed to be operating is denoted by 'D' to indicate daytime operation, 'N' to indicate nighttime operation and 'A' to indicate that the equipment runs all the time. For this assessment it is assumed that all of the proposed plant and ventilation equipment operates all of the time.
- 2.6 NoysPlot has the capability to accept input noise data in a number of formats. Where available, the ventilation plant manufacturer's sound power level data (designated by the letter W in the L_n/L_w column of the input schedule) is used. Where the sound power level data is not available the manufacturer's un-weighted octave band sound pressure levels at a stated distance are used (designated P but with an N in the dBA column of the schedule to indicate un-weighted). Alternatively, the manufacturer's A-weighted, single figure, averaged level at the stated distance is used (designated 'P' with 'Y' in the dBA column of the schedule). For this assessment, the air source heat pumps, heat recovery unit (air handling), and the extract fans have been inputted as octave band sound power levels, with the refrigeration equipment, comprising an ICP unit, refrigeration pack and gas cooler, inputted as single figure A-weighted noise level data.
- 2.7 The surface directivity is also assessed for all cases – this depends on the number of adjacent relative surfaces – the number can be seen in the column headed Q in the input schedule.
- 2.8 A summary of the atmospheric noise calculations for daytime and nighttime are displayed in Appendices C3 and C4. Calculations for each source to receiver can be made available upon request. These calculations consider the attenuation afforded by distance, outlet reflection, angular and surface directivity and acoustic screening. The software maintains a logarithmic summation for each receiver position and ranks the individual noise sources in order of contribution to the overall noise level (highest at the top of the list). This assists with the identification of those noise sources requiring additional noise control.

Superseded

- 2.9 The input data defining the locations of the noise sources, the receivers and screening are shown in Appendix C2. The NoysPlot model principally considers two noise barrier types; the barrier descriptor ‘R’ is used in the schedule to denote a ring type whereby only noise transmitted over the top of the barrier is considered; whilst noise barriers denoted ‘F’ for finite consider noise transmitted over the top and around the ends of the barrier. A ring type barrier has been used in this assessment to denote the Aldi store building. Finite barriers have been used to model the 1.8m boundary fence and the 1.1m boundary wall to the west of the site. Additionally, a finite barrier has been used to represent a 2.4-metre-high acoustic grade fence required to the west of the Aldi store that surrounds the gas cooler, refrigeration pack and ICP unit.
- 2.10 The NoysPlot calculations (see Appendix C3) show the following resultant plant rating noise levels:

TABLE 1: Predicted plant (rating) sound levels

Noise sensitive receptor	Predicted rating sound level dB(A)	
	Daytime	Night time
2 Borough Street	38	38
5 Isaac’s Place	37	38
40 Enfield Street	33	38
37 Enfield Street	31	36
1 Borough Street	31	34
12 Ysguthan Road	31	36

- 2.11 In order to achieve the predicted noise levels in Table 1 it is recommended that attenuators are fitted to the atmospheric side of the flues for the Heat Recovery Unit (HRU), and staff area welfare extract fans. In addition, as mentioned above, the refrigeration is required to be screened by the provision of a 2.4 metre high acoustic grade fence, as indicated at Appendix A. The table below (and the schedule at Appendix C1.2) presents the minimum insertion loss requirements for the recommended attenuators:

TABLE 2: Minimum insertion loss requirements

Equipment name/reference	Insertion loss – Mid frequency octave bands (Hz)							
	63	125	250	500	1K	2K	4K	8K
HRU Fresh air intake	4	6	10	12	13	9	7	4
HRU exhaust	4	6	10	12	13	9	7	4
Staff welfare area (EF1,EF2,EF3,EF4,EF5)	0	1	4	5	5	5	4	4

- 2.12 The predicted rating noise levels at the nearest residential receptors from the proposed plant are objectively demonstrated to comply with the requirements of planning condition 9, to not exceed 42 dBA daytime or 39 dBA at night.

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3.0 Assessment conclusions

3.1 This assessment considers noise associated with the proposed fixed plant equipment for the consented Aldi store at Burrows Yard, Afan Way, Port Talbot.

3.2 This report is presented to seek this discharge of planning condition 9 of planning permission P2024/0339. Planning condition 9 states:

“9 No fixed plant and/or machinery shall be brought into beneficial operation until details of the fixed plant and machinery serving the development hereby permitted, and any mitigation measures to achieve this condition, are submitted to and approved in writing by the local planning authority. The rating level of the plant sound emitted from the site shall not exceed 42 dBA between 0700 hours to 2300 hours and 39 dBA at all other times. The sound levels shall be determined by measurement or calculation at the nearest noise sensitive premises. The measurements and assessment shall be made according to BS 4142:2014+A1:2019. The fixed plant and machinery on-site shall thereafter be operated in accordance with the approved details.

Reason: To protect the amenity of the locality, especially for people living and/or working nearby, in accordance with Policy EN8 and BE1 of the Neath Port Talbot County Borough Council Local Development Plan (2011-2026) Adopted January 2016.”

3.3 The calculations presented within this noise assessment objectively demonstrate that predicted plant rating noise levels would comply with the requirements of planning condition 9.

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APPENDIX A

SITE LAYOUT

Superseded

Appendix A: Site location plan

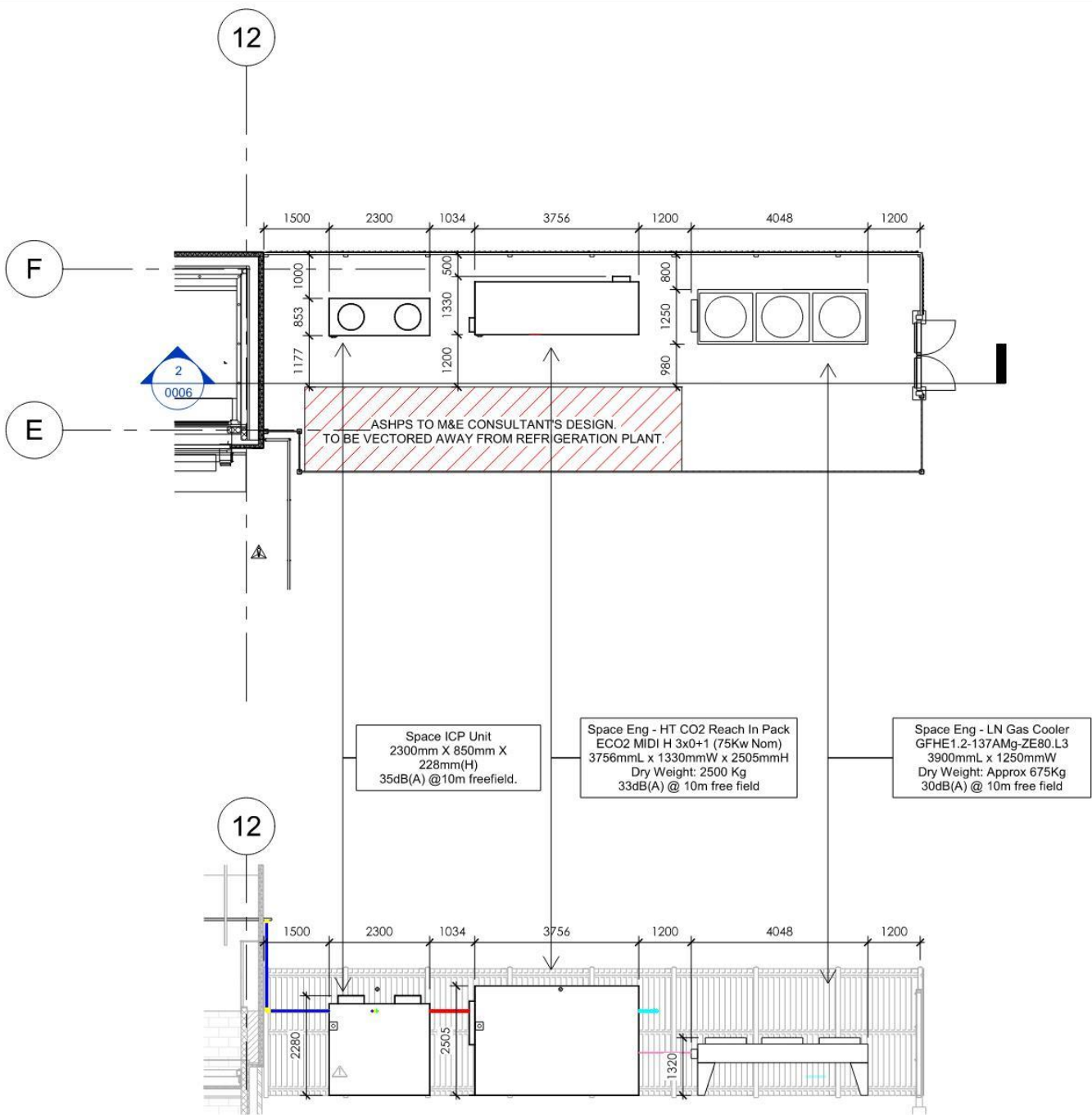


Superseded

APPENDIX B

PLANT DETAILS

Superseded



② R6 Plant Compound Section
1 : 100

Drawing Revisions				
Rev	Date	Description	Drawn	Chk'd By
P01	08/05/2025	Original Issue.	AA	RP

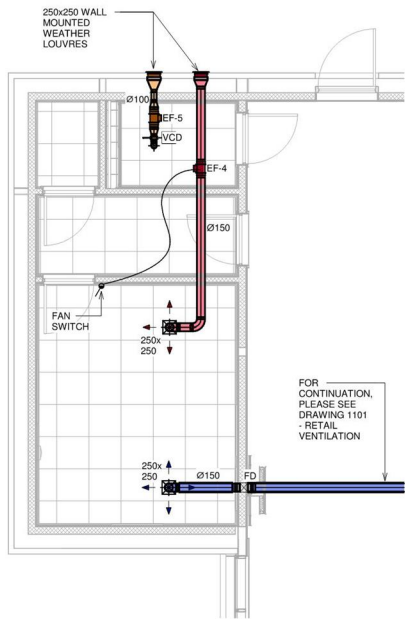
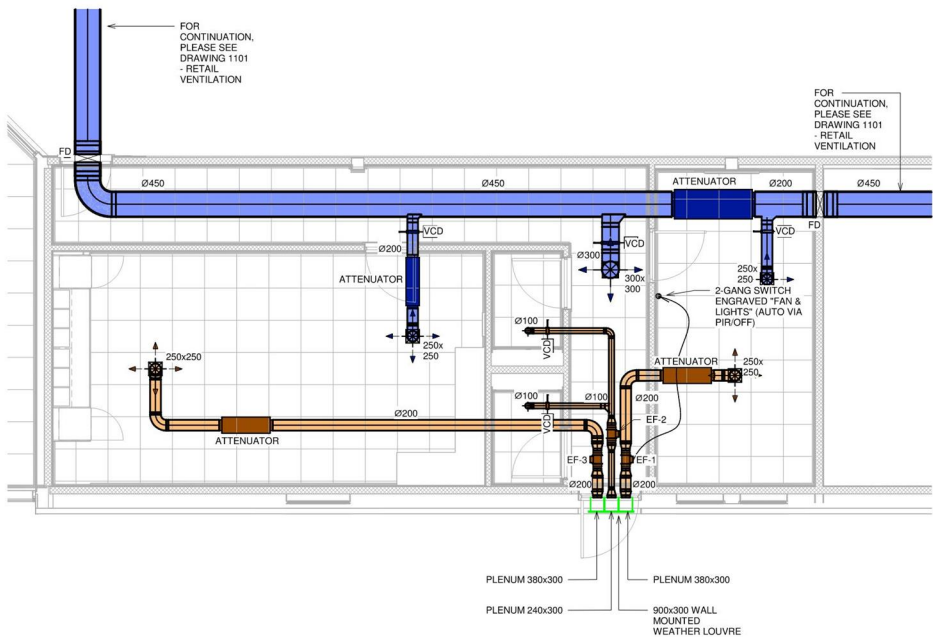
Client		ALDI - CRD				
Project Title		Aldi Port Talbot				
Project Address						
Drawing Title		Burrows Yard, Afan Way, Port Talbot				
Drawing Title		R6 Plant Compound Layout				
Drawn	Checked	Scale @ A3	BIM Status	Date		
AA	RP	1 : 100	S2	05/2025		
Drawing Status		Revision	K2 Project No.			
For Information		P01	1023			
Project No.	Originator	Volume	Level	Type	Role	Number
79-E0588 - K2E - XX - 00 - DR - N - 0006						

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Specialists in Refrigeration and Air Conditioning

K2 Engineering (Cooling) Ltd
2 The Parade
Brighton Road
Burgh Heath
Surrey KT20 6AT

Tel: +44 (0) 20 8394 0900
Email: david@k2cooling.com

Superseded



SYMBOLS LEGEND

	AIR EXTRACT/SUPPLY VALVE 100ø, 150ø & 200ømm
	SOUND ATTENUATOR (CROSSTALK) FITTED ON 250ømm AIR DUCT
	ROUND AIR DUCT 125ømm, CARRYING 32 l/s OF AIR
	VOLUME CONTROL DAMPER FITTED ON CIRCULAR AIR DUCT
	FIRE DAMPER INSTALLED IN CIRCULAR AIR-DUCT, FIRE RATED 1/2-1 1/2 HOUR, AS PER ARCHITECTS FIRE STRATEGY PLANS
	EGGCRATE CORE GRILLE
	MOTION DETECTION SENSOR (PIR DETECTOR)

EXTRACT FANS SCHEDULE

EF-1	OPERATION 104 l/s (374m³/h) @ 100Pa, SFP~0.25, 2,874 RPM, 1Ph 230V/50Hz, ~26W, ~0.25A
EF-2	OPERATION 24 l/s (~86m³/h) @ 100Pa, SFP~0.70, 2,874 RPM, 1Ph 230V/50Hz, ~17W, ~0.18A
EF-3	OPERATION 96 l/s (346m³/h) @ 100Pa, SFP~0.24, 2,794 RPM, 1Ph 230V/50Hz, ~23W, ~0.23A
EF-4	OPERATION 48 l/s (173m³/h) @ 100Pa, SFP~0.35, 2,530 RPM, 1Ph 230V/50Hz, ~17W, ~0.18A

CEILING VOID MOUNTED, SYSTEMAIR P160EC CIRCULAR DUCT EXTRACT FAN, 160øx220mm. CHARACTERISTICS

- EC MOTOR WITH SPEED CONTROL
- INTEGRATED MOTOR PROTECTION
- ENCLOSURE CLASS IP44
- CAN BE INSTALLED IN ANY POSITION
- WEIGHT: 1.6kg
- SOUND PRESSURE: 47 db(A) @ 3m.

- VENTILATION NOTES:**
1. FANS EF-2, EF-3 & EF-4 WILL BE ACTIVE DURING STORE OCCUPATION.
 2. FANS EF-2 & EF-3 TO BE SWITCHED VIA 'STAFF LEVEL' LIGHTING AND SHALL INCORPORATE 'RUN ON' TIMERS.
 3. FANS EF-1 & EF-4 TO BE SWITCHED VIA 'STAFF LEVEL' LIGHTING, WITH WALL MOUNTED OVERRIDE SWITCH AND SHALL INCORPORATE A 'RUN ON' TIMER.
 4. ALL FANS WILL BE OF SYSTEMAIR MANUFACTURE, TYPE P160EC.
 5. ALL EGGCRATE CORE GRILLES WILL BE OF GDL MANUFACTURE OR EQUAL & APPROVED.
 6. ALL WEATHER LOUVRES WILL BE OF GDL MANUFACTURE TYPE WG950-50mm OR EQUAL & APPROVED.
- COLOUR FINISH: WHITE**

REV	DATE	DESCRIPTION	DRW	ENG
001	15.04.25	FIRST ISSUE	JC	MG

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Client: **ALDI (CRD)**

83833 - PORT TALBOT

Project Address: **ALDI, AFAN WAY, PORT TALBOT**

Drawing Title: **MECHANICAL SERVICES WELFARE AREA VENTILATION**

Job No.	Originator	Drawn	Level	Name	Role
79-XXXX BMT	ZZ	ZZ	DR	M	

System Classification: **Ss. 65_40_00_00-1107** Drawing No. **A5** Subplot **C01**

Drawn	Checked	Date	Scale	Rev
JC	MG	15.04.2025	1:50	A1

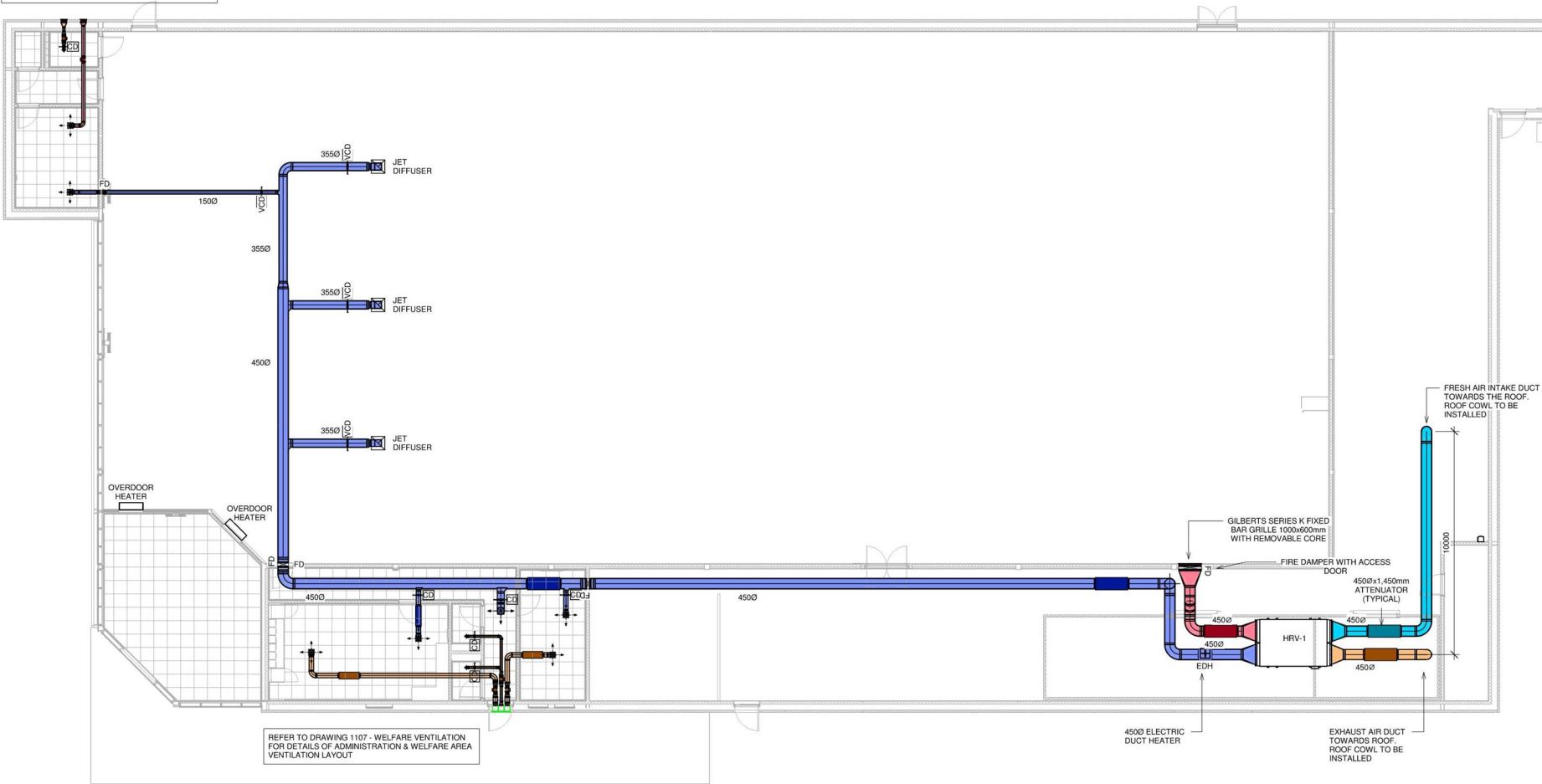
BMT BUILDING MANAGEMENT TECHNOLOGY

920B Melton Road (First Floor)
Thurmashton
Leicestershire
LE4 8UR

Tel: (0153) 2114 0331
E-Mail: <firstname.surname@bmt-uk.co.uk>

Superseded

REFER TO DRAWING 1107 - WELFARE VENTILATION FOR DETAILS OF ADMINISTRATION & WELFARE AREA VENTILATION LAYOUT



REFER TO DRAWING 1107 - WELFARE VENTILATION FOR DETAILS OF ADMINISTRATION & WELFARE AREA VENTILATION LAYOUT

- THIS DRAWING MUST NOT BE SCALED AND ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE WORK IS COMMENCED.
- FOR SETTING OUT DETAILS PLEASE SEE ARCHITECTS DRAWINGS.
- ANY DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE CONSULTANTS.
- ALL INFORMATION SHOWN ON THE DRAWING IS SUBJECT TO OBTAINING THE NECESSARY STATUTORY CONSENTS.

- VENTILATION NOTES:**
- ALL DUCT RUNS AND INTAKE/EXTRACT POSITIONS TO BE CONFIRMED AND SITE MEASURED PRIOR TO MANUFACTURE.
 - THE TYPE, ORIENTATION & HEIGHT OF THE ROOF WILL DETERMINE ROOF OR WALL INTAKE/EXHAUST LOCATIONS.
 - ALL BUILDERS WORK OPENINGS TO BE CONFIRMED BY SUPPLIER AND INSTALLED BY THE MECHANICAL CONTRACTOR.
 - CO₂ SENSOR TO BE PROVIDED FREE ISSUE BY THE BMS SUPPLIER AND INSTALLED BY THE MECHANICAL CONTRACTOR.
 - THE MINIMUM HEAD HEIGHT TO UNDERSIDE OF DUCT IN WAREHOUSE SHALL BE 3000mm AFFL.
 - ALL EXTERNAL TEMPERATURE SENSORS ARE TO BE LOCATED ON NORTH FACING WALLS. HOWEVER, IF THIS IS NOT POSSIBLE THEN A PURPOSE RADIANT SHIELD AND MOUNTING BRACKET MUST BE REQUIRED.
 - THE HEAT RECOVERY UNIT (HRV) WILL NEED TO BE INSTALLED BEFORE THE COLD ROOMS ARE BUILT.
 - THE HRV IS BOTTOM ACCESSIBLE - UNIT TO BE RAISED TO ALLOW FILTER CHANGING.
 - DOOR HEATERS ARE TO BE MOUNTED BELOW THE CEILING.
 - ALL EGGRATE CORE GRILLES WILL BE OF GDL MANUFACTURE OR EQUAL & APPROVED. COLOUR FINISH: WHITE

REV	DATE	DESCRIPTION	DRW	ENG
C01	15.04.25	FIRST ISSUE	JC	MG



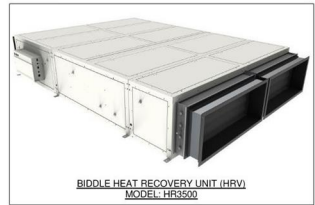
EDH
ELECTRIC DUCT HEATER
MANUFACTURER: AAH LTD
DIAMETER: 450mm
MODEL C450ES CIRCULAR HEATER (AAH/8)
CAPACITY: 9kW/400V
C/W TEMPERATURE CONTROLLER, EQUIPPED WITH:
• SOLID STATE RELAY (SSR)
• AIR FLOW SWITCH
• OVERHEAT CUT-OUT
• SUPPLY FAN 1 (TEMPERATURE CONTROLLED)
• SUPPLY FAN 2 (CONSTANT RUN)
• 2 DIGIT LED DISPLAY
• PUSH BUTTONS (PCB MOUNTED)
• LEDS (POWER ON, HEATER ON, ERROR)
• 0-10 VOLT SIGNAL FOR SET POINT TEMPERATURE
• OPTIONAL REMOTE FAULT RELAY FOR FAULT SIGNAL FOR BMS



ROOF COWLS
MANUFACTURER: SYSTEMAIR (FANS & SPARES)
MODEL: RA-630
CASING: GLASS REINFORCED PLASTIC WITH ULTRA-VIOLET STABILISER
HORIZONTAL DISCHARGE WITH BIRD GUARD
CONNECTION OPENING: 790x790mm
EXTERNAL DIMENSIONS: 1115x1115mm
HEIGHT: 650mm
WEIGHT: 70kg
COLOURED TO RAL OR BS
STANDARD COLOUR: RAL 7035 GOOSEWING GREY

SYMBOLS LEGEND	
	SOUND ATTENUATOR (CROSSTALK) FITTED ON Ø450 mm AIR DUCT
	ROUND AIR DUCT Ø125 mm CARRYING 32 L/s OF AIR
	VOLUME CONTROL DAMPER FITTED ON CIRCULAR AIR DUCT
	FIRE DAMPER AND ACCESS DOOR INSTALLED IN CIRCULAR AIR DUCT. FIRE RATED 1/2 - 1 1/2 HOUR, AS PER ARCHITECTS FIRE STRATEGY PLANS
	EGG CRATE CORE GRILLE 250x250 mm
	EGG CRATE CORE GRILLE 600x600 mm
	EGG CRATE CORE GRILLE Ø200 mm

HRV-1
BIDDLE HEAT RECOVERY (HRV) UNIT, TYPE HR3500.
• FLAT PLANTROOM, INSPECTION / MAINTENANCE THROUGH BOTTOM ACCESS
• EG FAN MOTORS (DC CONTROLLED 5-10V)
• CAPACITY: 972 L/s (3,500 m³/h)
• HEAT EFFICIENCY = ~ 76.5%
SUPPLY AIR FAN
max 3,500 m³/h @ 300 Pa SPEED 100% (10 VCD)
POWER INPUT 1.35 kW / 230 V / 5.56 A, SFP = ~ 1.37,
EXTRACT AIR FAN
max 3,500 m³/h @ 150 Pa SPEED 100% (10 VCD)
POWER INPUT 1.29 kW/230 V / 5.14 A, SFP = ~ 1.37,
NOISE LEVEL
• 66 db(A) @ 1m FROM UNDERSIDE OF UNIT
• SUPPLY AIR TO STORE: 86.6 db(A)
• EXTRACT AIR FROM STORE: 76.7 db(A)
FEATURES
• CONDENSATE BY GRAVITY THROUGH CONDENSATE TRAP
• DIRTY FILTER INDICATION
PROJECT AIR FLOW RATE: 961.2 L/s (3,460 m³/h)
DIMENSIONS: (W x L x H) = 2,160 x 2,910 x 544 mm
WEIGHT = 580 kg
CONNECTIONS = 500 x 380 mm



ODH-1 & ODH-2
OVERDOOR HEATERS (AIR CURTAINS)
MANUFACTURER: BIDDLE
MODEL: DF L-150-W4-F
EXPOSED UNIT WITH HIGH OUTPUT COIL
MAXIMUM MOUNTING HEIGHT: 3.5m
AIR FLOW RATE (L-M-H): 439-570-731 l/s
WATER FLOW RATE: 0.15 l/s (540 L/h)
WATER PRESSURE DROP: 0.19 mWG
HEATING CAPACITY (L-M-H): 9-10.6-12.3 kW
(20°C ENTERING AIR & 60/40°C LTHW F&R)
DIMENSIONS (WxDxH): 1500x570x270mm
RATED POWER INPUT: 0.7kW/230V
NOISE LEVEL: 48 db(A) @ MEDIUM SPEED
WEIGHT: 50kg

Client

ALDI (CRO)

Project Address

**ALDI,
AFAN WAY,
PORT TALBOT**

Drawing No.

79-XXXX BMT

System Classification

Ss_65_40_00_00-1101 A5 C01

Drawn

JC

Checked

MG

Date

15.04.2025

Scale

1:100

Size

A1

Revision

1

MECHANICAL SERVICES
RETAIL AREA VENTILATION GA

BMT BUILDING MANAGEMENT TECHNOLOGY

9-208 Milton Road (First Floor)
Thurston
Leicestershire
LE4 6CR

Tel: (0165) 244 0331
E-Mail: firstname.surname@bmt-td.co.uk

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Date

15.04.2025

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1:100

Size

A1

Superseded

APPENDIX C

PLANT NOISE MODELLING CALCULATIONS

Superseded

[illegible]

Superseded

[illegible]

Superseded

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

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

Filename: p:\23 - Projects\2321696 Aldi, Port Talbot- KJM\NoysPlot\Final scheme\Aldi Port Talbot
Date: 24 June 2025
Entries by: A J Metcalfe
Project no: 2321696
Project title: Aldi Port Talbot
Client's name: Aldi Stores Limited

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
ASHP #1	504.1	583.1	0.6	0	0	0	200	2	A	W	N	0.0	0	64	64	52	54	54	52	46
ASHP #2	504.1	580.1	0.6	0	0	0	200	2	A	W	N	0.0	0	64	64	52	54	54	52	46
ASHP #3	504.1	577.1	0.6	0	0	0	200	2	A	W	N	0.0	0	64	64	52	54	54	52	46
Gas Cooler	501.3	575.1	1.6	0	0	0	200	2	A	P	Y	10.0	30 dBA							
Compressor Pack	501.3	579.1	2.4	0	0	0	200	2	A	P	Y	10.0	33 dBA							
ICP Unit	501.3	584.5	2.0	0	0	0	200	2	A	P	Y	10.0	35 dBA							
HRU Exhaust	529.0	561.0	5.2	0	0	0	100	1	A	W	N	0.0	76	71	79	78	81	81	78	75
HRU FAI	518.3	561.0	5.2	0	0	0	100	1	A	W	N	0.0	69	66	76	72	69	70	68	67
Welfare EF1	531.2	517.5	2.2	900	300	90	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53
Welfare EF2	531.2	517.5	2.2	900	300	90	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53
Welfare EF3	531.2	517.5	2.2	900	300	90	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53
Welfare EF4	499.8	503.7	2.2	250	250	270	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53
Welfare EF5	499.8	502.6	2.2	250	250	270	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53

Receptor data - description and co-ordinates

Receptor description	Co-ordinates			DNA
	X m	Y m	Z m	
5 Isaac's Place	484.5	494.0	4.5	N
2 Borough Street	485.0	512.4	4.5	N
1 Borough Street	486.0	530.6	4.5	N
37 Enfield Street	485.5	558.0	4.5	N
40 Enfield Street	485.5	574.0	4.5	N
12 Ysguthan Road	499.0	617.0	4.5	N
5 Isaac's Place	484.5	494.0	1.5	D
2 Borough Street	485.0	512.4	1.5	D
1 Borough Street	486.0	530.6	1.5	D
37 Enfield Street	485.5	558.0	1.5	D
40 Enfield Street	485.5	574.0	1.5	D
12 Ysguthan Road	499.0	617.0	1.5	D

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	572.5	5.0
Ring Barrier	500.0	572.5	5.0	504.9	572.5	5.0
Ring Barrier	504.9	572.5	5.0	504.9	566.5	5.0
Ring Barrier	504.9	566.5	5.0	531.0	566.5	5.0
Ring Barrier	531.0	566.5	5.0	531.0	503.3	5.0
Ring Barrier	531.0	503.3	5.0	509.2	503.3	5.0
Ring Barrier	509.2	503.3	5.0	509.2	500.0	5.0
Ring Barrier	509.2	500.0	5.0	500.0	500.0	5.0
Finite Barrier	495.2	455.0	1.1	495.2	515.0	1.1
Finite Barrier	495.2	513.0	1.8	495.1	513.0	1.8
Finite Barrier	495.1	513.0	1.8	495.0	599.0	1.8
Finite Barrier	495.0	599.0	1.8	503.0	603.0	1.8
Finite Barrier	500.0	572.5	2.4	498.2	572.5	2.4
Finite Barrier	498.2	572.5	2.4	498.2	589.0	2.4
Finite Barrier	498.2	589.0	2.4	502.0	589.0	2.4

Superseded

Appendix C3: Predicted daytime noise levels

Overall receptor listings
Period: Day time

Overall predicted plant noise levels (dB)	Mid frequency octave bands (Hz)							
	63	125	250	500	1k	2k	4k	8k
2 Borough Street	42	34	32	33	32	31	29	23
5 Isaac's Place	40	33	32	33	32	31	29	23
40 Enfield Street	51	42	35	27	24	22	19	20
12 Ysguthan Road	45	37	33	24	23	24	22	21
37 Enfield Street	48	39	34	25	22	20	18	17
1 Borough Street	44	35	30	26	25	22	20	15

Source noise levels at receiver: 12 Ysguthan Road

Period: Day time

Plant Item	Mid frequency octave bands (Hz)							
	63	125	250	500	1k	2k	4k	8k
HRU Exhaust	23	16	20	17	19	22	21	20
ICP Unit	43	33	25	18	14	11	9	8
ASHP #2	0	28	27	14	14	12	8	0
ASHP #1	0	28	27	13	14	12	7	0
Compressor Pack	39	29	22	16	13	11	10	11
ASHP #3	0	27	26	13	13	11	7	0
HRU FAI	17	12	18	12	8	12	12	13
Gas Cooler	36	26	18	11	6	3	1	0
Welfare EF4	9	11	8	6	1	0	0	0
Welfare EF5	9	11	8	6	1	0	0	0
Welfare F3	2	1	0	0	0	0	0	0
Welfare EF1	2	1	0	0	0	0	0	0
Welfare EF2	2	1	0	0	0	0	0	0
Total Free field Lp and dBA	45	37	33	24	23	24	22	21

Source noise levels at receiver: 5 Isaac's Place

Period: Day time

Plant Item	Mid frequency octave bands (Hz)							
	63	125	250	500	1k	2k	4k	8k dBA
Welfare EF5	19	26	28	30	29	28	26	20
Welfare EF4	19	26	28	30	29	28	26	20
Compressor Pack	35	25	18	12	9	8	8	10
ICP Unit	37	27	19	13	9	6	4	4
HRU Exhaust	20	12	15	10	9	11	7	5
ASHP #1	0	17	15	1	1	0	0	0
Gas Cooler	30	19	11	3	0	0	0	0
HRU FAI	13	8	13	5	0	1	0	0
ASHP #2	0	15	13	0	0	0	0	0
ASHP #3	0	13	10	0	0	0	0	0
Welfare EF3	7	6	0	0	0	0	0	0
Welfare EF1	7	6	0	0	0	0	0	0
Welfare EF2	7	6	0	0	0	0	0	0
Total Free field Lp and dBA	40	33	32	33	32	31	29	23

Source noise levels at receiver: 2 Borough Street

Period: Day time

Plant item	Mid frequency octave bands (Hz)							
	63	125	250	500	1k	2k	4k	8k
Welfare EF5	19	26	28	30	29	28	26	20
Welfare EF4	19	26	28	30	29	28	26	20
Compressor Pack	37	27	20	14	11	9	9	10
ICP Unit	39	28	21	14	10	7	5	5
HRU Exhaust	22	14	16	11	10	12	8	7
ASHP #1	0	20	19	5	5	2	0	0
Gas Cooler	32	22	13	6	1	0	0	0
HRU FAI	16	10	15	7	1	3	0	0
ASHP #2	0	18	16	2	1	0	0	0
ASHP #3	0	16	13	0	0	0	0	0
Welfare EF3	7	7	1	0	0	0	0	0
Welfare EF1	7	7	1	0	0	0	0	0
Welfare EF2	7	7	1	0	0	0	0	0
Total Free field Lp and dBA	42	34	32	33	32	31	29	23

Source noise levels at receiver: 1 Borough Street

Period: Day time

Plant Item	Mid frequency octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Welfare EF4	16	20	22	22	21	17	15	6	25
Welfare EF5	16	20	21	22	21	17	15	6	25
Compressor Pack	40	30	22	16	12	11	10	11	22
ICP Unit	40	30	22	15	11	8	7	6	21
HRU Exhaust	23	15	17	12	11	13	9	9	18
ASHP #1	0	22	21	9	10	8	4	0	17
Gas Cooler	36	25	17	11	6	3	1	0	16
ASHP #2	0	22	21	7	6	4	0	0	15
HRU FAI	18	12	16	8	2	4	1	2	12
ASHP #3	0	19	17	2	2	0	0	0	10
Welfare EF3	7	6	0	0	0	0	0	0	0
Welfare EF1	7	6	0	0	0	0	0	0	0
Welfare EF2	7	6	0	0	0	0	0	0	0
Total Free field Lp and dBA	44	35	30	26	25	22	20	15	31

Source noise levels at receiver: 37 Enfield Street

Period: Day time

Plant Item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Compressor Pack	44	34	27	20	17	15	14	15	26
ICP Unit	44	33	26	19	14	12	9	9	24
Gas Cooler	43	32	24	16	11	7	4	3	22
ASHP #3	0	27	27	14	14	12	7	0	21
ASHP #2	0	28	26	12	12	9	4	0	20
HRU Exhaust	24	16	18	12	12	13	10	10	19
ASHP #1	0	26	24	10	10	7	2	0	18
Welfare EF4	10	14	12	14	10	4	2	0	15
HRU FAI	20	14	18	10	4	6	3	5	14
Welfare EF5	14	16	12	11	7	2	0	0	12
Welfare EF3	4	3	0	0	0	0	0	0	0
Welfare EF1	4	3	0	0	0	0	0	0	0
Welfare EF2	4	3	0	0	0	0	0	0	0
Total Free field Lp and dBA	48	39	34	25	22	20	18	17	31

Source noise levels at receiver: 40 Enfield Street

Period: Day time

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Compressor Pack	48	37	30	24	20	19	17	18	29
ICP Unit	47	37	29	22	17	14	12	11	27
Gas Cooler	44	33	24	16	11	7	4	4	23
ASHP #3	0	29	26	12	11	8	4	0	20
ASHP #2	0	28	26	12	11	8	4	0	20
ASHP #1	0	28	26	12	11	8	4	0	20
HRU Exhaust	24	16	18	12	12	13	10	10	19
HRU FAI	20	13	18	9	3	5	2	4	14
Welfare EF4	12	13	10	9	5	0	0	0	10
Welfare EF5	12	14	10	9	5	0	0	0	10
Welfare EF3	3	3	0	0	0	0	0	0	0
Welfare EF1	3	3	0	0	0	0	0	0	0
Welfare EF2	3	3	0	0	0	0	0	0	0
Total Free field Lp and dBA	51	42	35	27	24	22	19	20	33

Superseded

Appendix C4: Predicted night time noise levels

Overall receptor listings
Period: Night time

Overall predicted plant noise levels (dB)	Mid frequency octave bands (Hz)						
	63	125	250	500	1k	2k	4k 8k dBA
40 Enfield Street	53	44	39	32	30	30	29 30 38
2 Borough Street	41	35	33	33	32	32	30 26 38
5 Isaac's Place	40	34	32	33	32	32	30 25 38
37 Enfield Street	49	41	37	29	28	28	27 27 36
12 Ysguthan Road	45	38	36	27	28	29	27 28 36
1 Borough Street	44	35	32	28	27	26	25 24 34

Source noise levels at receiver: 12 Ysguthan Road

Period: Night time

Plant item	Mid frequency octave bands (Hz)						
	63	125	250	500	1k	2k	4k 8k dBA
HRU Exhaust	23	16	20	17	19	24	23 25 30
ASHP #2	0	29	31	19	21	21	19 13 28
ASHP #1	0	29	30	19	21	21	19 13 28
ASHP #3	0	28	30	18	20	20	18 12 27
ICP Unit	43	33	26	20	17	16	16 18 26
Compressor Pack	40	30	23	18	18	17	17 19 26
HRU FAI	17	12	18	12	9	14	15 18 22
Gas Cooler	36	26	19	13	10	10	10 14 20
Welfare EF4	10	13	10	9	5	0	0 0 10
Welfare EF5	11	13	10	9	5	0	0 0 10
Welfare EF3	2	2	0	0	0	0	0 0 0
Welfare EF1	2	2	0	0	0	0	0 0 0
Welfare EF2	2	2	0	0	0	0	0 0 0
Total Free field Lp and dBA	45	38	36	27	28	29	27 28 36

Source noise levels at receiver: 5 Isaac's Place

Period: Night time

Plant item	Mid frequency octave bands (Hz)						
	63	125	250	500	1k	2k	4k 8k dBA
Welfare EF5	22	28	28	30	29	28	26 20 34
Welfare EF4	22	28	28	30	29	28	26 20 34
HRU Exhaust	21	14	18	15	17	21	19 18 26
Compressor Pack	34	24	18	14	11	10	10 12 19
ICP Unit	37	27	20	13	10	8	8 9 19
HRU FAI	14	9	15	9	5	10	10 11 17
ASHP #1	0	17	15	1	1	0	0 0 9
Gas Cooler	30	19	11	3	0	0	0 0 9
ASHP #2	0	15	13	0	0	0	0 0 5
ASHP #3	0	13	11	0	0	0	0 0 4
Welfare EF3	7	6	0	0	0	0	0 0 0
Welfare EF1	7	6	0	0	0	0	0 0 0
Welfare EF2	7	6	0	0	0	0	0 0 0
Total Free field Lp and dBA	40	34	32	33	32	32	30 25 38

Source noise levels at receiver: 2 Borough Street

Period: Night time

Plant item	Mid frequency octave bands (Hz)						
	63	125	250	500	1k	2k	4k 8k dBA
Welfare EF5	22	28	28	30	29	28	26 20 34
Welfare EF4	22	28	28	30	29	28	26 20 34
HRU Exhaust	23	16	20	17	19	22	21 20 27
Compressor Pack	35	26	21	16	13	12	12 14 21
ICP Unit	39	29	21	15	11	10	10 11 21
HRU FAI	17	12	18	12	8	13	12 14 19
ASHP #1	0	20	19	5	5	2	0 0 13
Gas Cooler	33	22	13	6	1	0	0 0 12
ASHP #2	0	18	16	2	1	0	0 0 9
ASHP #3	0	16	13	0	0	0	0 0 5
Welfare EF3	8	7	1	0	0	0	0 0 0
Welfare EF1	8	7	1	0	0	0	0 0 0
Welfare EF2	8	7	1	0	0	0	0 0 0
Total Free field Lp and dBA	41	35	33	33	32	32	30 26 38

Source noise levels at receiver: 1 Borough Street

Period: Night time

Plant item	Mid frequency octave bands (Hz)						
	63	125	250	500	1k	2k	4k 8k dBA
HRU Exhaust	25	18	22	19	21	24	22 21 29
Welfare EF4	18	22	22	22	21	17	15 6 25
Welfare EF5	18	22	22	22	21	17	15 6 25
Compressor Pack	38	30	25	19	16	15	15 17 24
ICP Unit	41	30	22	16	13	12	12 14 22
HRU FAI	19	14	20	14	10	15	14 15 21
ASHP #1	0	23	22	10	11	10	6 0 18
Gas Cooler	36	25	18	11	6	3	1 1 16
ASHP #2	0	22	21	7	7	4	0 0 15
ASHP #3	0	20	17	3	2	0	0 0 11
Welfare EF3	7	7	1	0	0	0	0 0 0
Welfare EF1	7	7	1	0	0	0	0 0 0
Welfare EF2	7	7	1	0	0	0	0 0 0
Total Free field Lp and dBA	44	35	32	28	27	26	25 24 34

Source noise levels at receiver: 37 Enfield Street

Period: Night time

Plant item	Mid frequency octave bands (Hz)						
	63	125	250	500	1k	2k	4k 8k dBA
Compressor Pack	45	38	31	25	22	21	21 23 31
HRU Exhaust	26	19	23	20	22	25	23 22 30
ICP Unit	44	34	27	20	17	17	17 20 27
ASHP #3	0	31	30	17	18	17	13 5 25
HRU FAI	22	17	23	17	13	18	17 18 24
Gas Cooler	44	33	25	18	14	11	9 8 24
ASHP #2	0	30	29	15	16	14	10 1 24
ASHP #1	0	28	27	14	15	13	9 0 22
Welfare EF4	11	15	15	18	14	8	6 0 19
Welfare EF5	15	17	15	15	11	6	4 0 16
Welfare EF3	4	4	0	0	0	0	0 0 0
Welfare EF1	4	4	0	0	0	0	0 0 0
Welfare EF2	4	4	0	0	0	0	0 0 0
Total Free field Lp and dBA	49	41	37	29	28	28	27 27 36

Source noise levels at receiver: 40 Enfield Street

Period: Night time

Plant item	Mid frequency octave bands (Hz)						
	63	125	250	500	1k	2k	4k 8k dBA
Compressor Pack	51	42	35	29	26	25	25 27 35
ICP Unit	48	37	30	24	21	21	21 25 31
HRU Exhaust	26	19	23	20	22	25	23 22 30
Gas Cooler	45	35	27	21	17	15	13 13 26
ASHP #1	0	31	30	17	18	16	11 3 25
ASHP #3	0	31	30	17	18	16	11 2 25
ASHP #2	0	31	30	17	18	16	11 2 25
HRU FAI	21	16	22	16	12	17	16 17 23
Welfare EF4	12	14	12	13	9	4	2 0 14
Welfare EF5	12	14	12	13	9	4	2 0 14
Welfare EF3	4	3	0	0	0	0	0 0 0
Welfare EF1	4	3	0	0	0	0	0 0 0
Welfare EF2	4	3	0	0	0	0	0 0 0
Total Free field Lp and dBA	53	44	39	32	30	30	29 30 38

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APPENDIX D

ACOUSTIC TERMINOLOGY

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Acoustic Terminology

- D1 Noise, defined as unwanted sound, is measured in units of decibels, dB. The range of audible sounds is from 0 dB to 140 dB. Two equal sources of sound, if added together will result in an increase in level of 3 dB, i.e. $50\text{ dB} + 50\text{ dB} = 53\text{ dB}$. Increases in continuous sound are perceived in the following manner:

1 dB increase - barely perceptible.

3 dB increase - just noticeable.

10 dB increase - perceived as twice as loud.

- D2 Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18000Hz (or 18kHz). The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.

- D3 To take account of the varying sensitivity of people to different frequencies a weighting scale has been universally adopted called "A-weighting". The measuring equipment has the ability automatically to weight (or filter) a sound to this A scale so that the sound level it measures best correlates to the subjective response of a person. The unit of measurement thus becomes dBA (decibel, A-weighted).

- D4 The second important characteristic of sound is amplitude or level. Two units are used to express level, a) sound power level - L_w and b) sound pressure level - L_p . Sound power level is an inherent property of a source whilst sound pressure level is dependent on surroundings/distance/directivity, etc. The sound level that is measured on a meter is the sound pressure level, L_p .

- D5 External sound levels are rarely steady but rise or fall in response to the activity in the area - cars, voices, planes, birdsong, etc. A person's subjective response to different noises has been found to vary dependent on the type and temporal distribution of a particular type of noise. A set of statistical indices have been developed for the subjective response to these different noise sources.

- D6 The main noise indices in use in the UK are:

L_{A90} : The sound level (in dBA) exceeded for 90% of the time. This level gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background sound level" of an area.

L_{Aeq} : The equivalent continuous sound level in dBA. This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the intermittent noise". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as aircraft and trains.

L_{A10} : The sound level (in dBA) exceeded for 10% of the time. This level gives an indication of the sound level during the noisier periods of time in any given

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sample. It has been used over many years to measure and assess road traffic noise.

L_{AMAX}: The maximum level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.

D7 The sound energy of a transient event may be described by a term SEL - Sound Exposure Level. This is the L_{Aeq} level normalised to one second. That is the constant level in dBA which lasting for one second has the same amount of acoustic energy as a given A weighted noise event lasting for a period of time. The use of this unit allows the prediction of the L_{Aeq} level over any period and for any number of events using the equation;

$$L_{AeqT} = SEL + 10 \log n - 10 \log T \text{ dB.}$$

Where

n = Number of events in time period T.

T = Total sample period in seconds.

D8 In the open, known as free field, sound attenuates at a rate of 6 dB per each doubling of distance. This is known as geometric spreading or sometimes referred to as the Inverse Square Law. As noise is measured on a Logarithmic scale, this attenuation in distance = 20 Log (ratio of distances), e.g. for a noise level of 60 dB at ten metres, the corresponding level at 160 metres is:

$$60 - 20 \text{ Log } \frac{160}{10} = 60 - 24 = 36 \text{ dB.}$$