

SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report

Proposed Aldi store at Reading Gateway, Sentinel End

Noise assessment report
seeking discharge of planning
condition 7 of planning
permission 221908

Prepared by

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Date 14th June 2023

Project No: 2321678

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1.0 Introduction

1.1 Sharps Redmore (SR) has been instructed to undertake a noise assessment to seek the discharge of planning condition 7 of planning permission 221908.

1.2 Aldi sought planning permission, which was granted in May 2023, for the sale of food and external alternations at unit 6 (unit C) Proctor End South, Reading RG2 0GG. Planning condition 7, which seeks to control noise from fixed plant equipment, states:

“7. No mechanical plant shall be installed until a noise assessment of the proposed mechanical plant has been submitted and approved by the Local Planning Authority. The assessment shall be carried out for in accordance with BS4142:2014 methodology. The predicted specific sound level (LAeq,TR) (with reference to BS:4142) as measured at a point 1 metre external to the nearest noise-sensitive facade shall be at least 10dB below the pre-existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation. The predicted rating level, LAr,Tr (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to the nearest noise-sensitive façade (habitable window of a dwelling) shall not exceed the pre-existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation. The plant shall thereafter only be installed in accordance with the assessment and shall thereafter be maintained so that it operates to the same standard.

REASON: To safeguard the amenities of the adjoining premises and the area generally, in accordance with Policy CC8 and EN17 of the Reading Borough Local Plan 2019”.

1.3 A site layout plan is presented at Appendix A indicating the location of the main Aldi refrigeration plant compound and the closest residential properties.

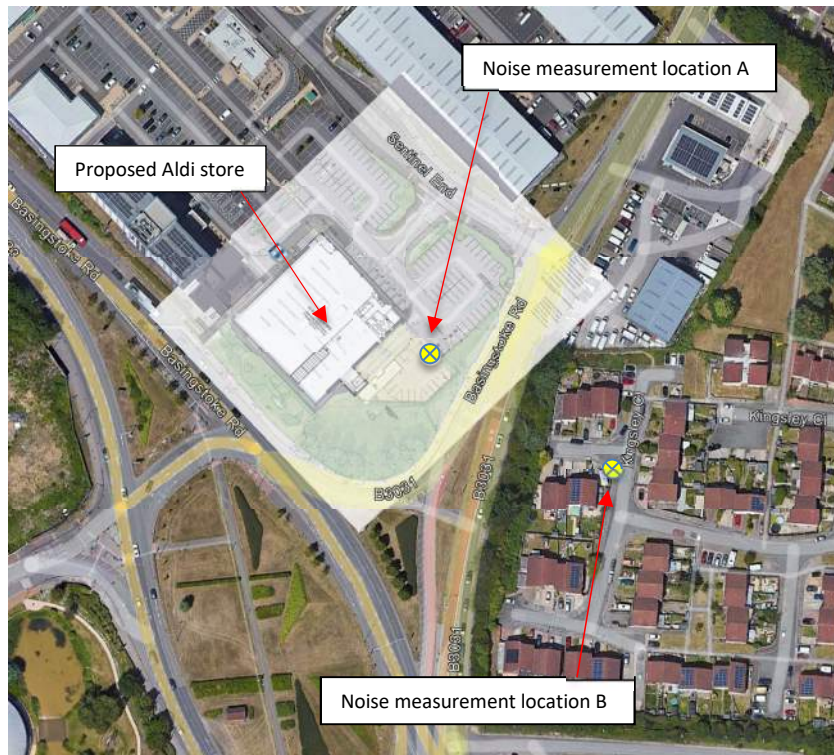
1.4 This report presents an assessment of noise from fixed plant equipment associated with the proposed Aldi Store. Details of a baseline noise survey undertaken in the vicinity of the site are presented at section 2.

1.5 An assessment presenting predicted Aldi plant noise levels is contained at Section 3, with the conclusions at Section 4.

2.0 Noise survey details

- 2.1 An baseline noise survey was carried out between Tuesday 31st and Wednesday 1st February 2023 at two measurement location representative of the noise climate in the vicinity of the closest residential receptors to the proposed store. At location A measurements were unattended, whilst short terms attended measurements were taken at location B, as indicated at Figure 1 below.

FIGURE 1: Noise measurement locations



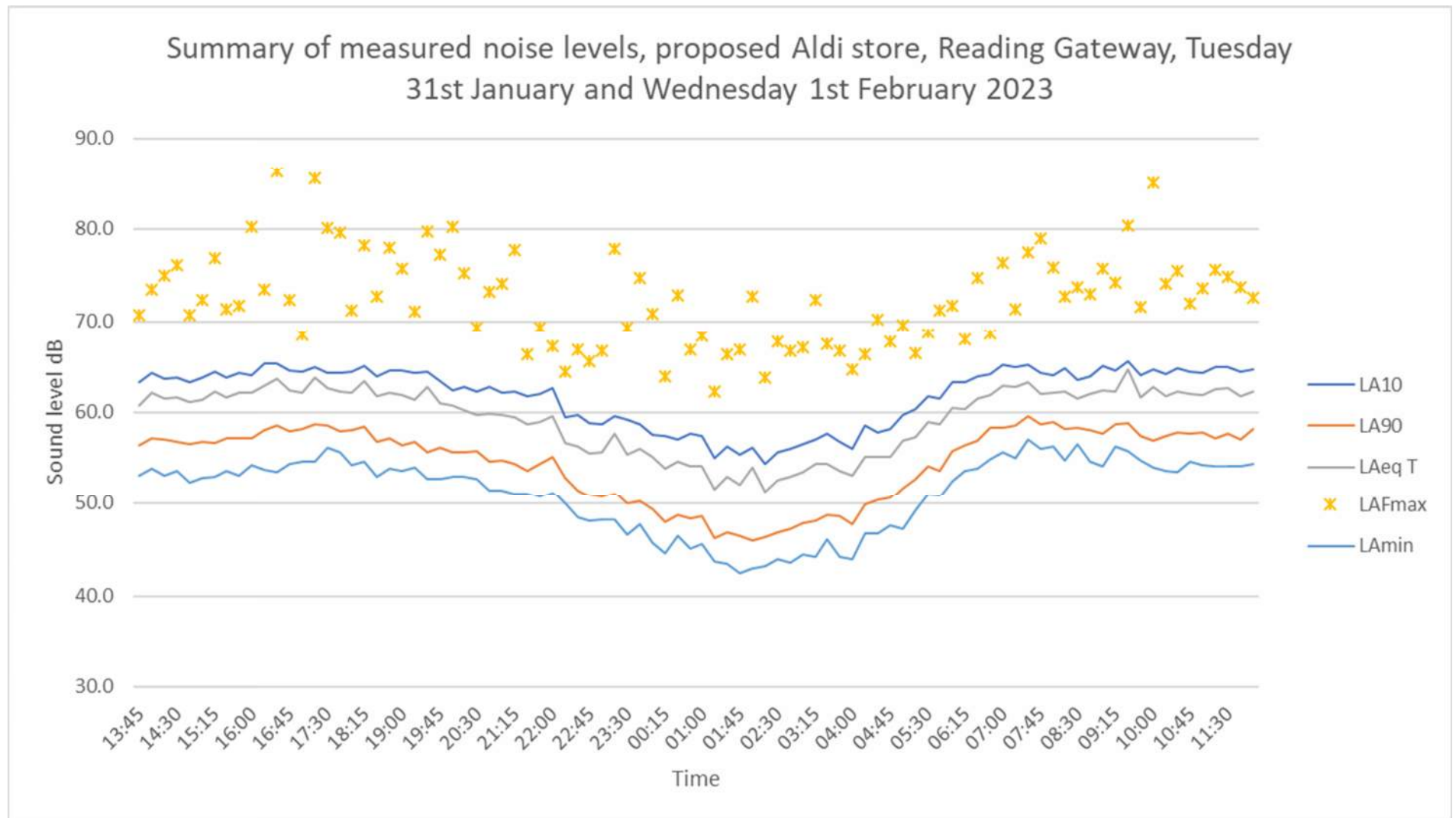
- 2.2 The weather conditions during the survey were dry; during the equipment set up and collection, weather conditions were partly cloudy, with temperatures between 4-8°C and light winds (<5m/s) mainly from the south west. Weather conditions are therefore not considered to have materially affected the measured noise levels during the survey.
- 2.3 The unattended baseline noise measurements were carried out using a Norsonic 140 sound level meter fitted with an environmental microphone kit. Short term attended measurements were carried out using a Norsonic 118 sound level meter. The sound level meters were calibrated at the start and end of the survey/each set of measurements and no variation in levels were observed. The baseline noise measurements at both locations were taken over 15 minute sample periods.
- 2.4 Measurements were taken in free field conditions with the microphone positioned approximately 3 metres above local ground level at location A and 1.5 metres above the ground at location B.

- 2.5 The noise survey was undertaken during the afternoon, through to midday the following day. This period was selected to obtain an indication as to typical daytime, evening and night time noise climate.
- 2.6 The site is currently a discussed retail unit (former Toys-R-Us unit), within a retail park setting, adjacent to several busy routes into Reading, just off the M4 Motorway. The closest residential properties are to the east in Kingsley Close, as indicated at Appendix A and Figure 1. The existing noise climate was dominated by local and distant road traffic sources.
- 2.7 The measured baseline noise levels from location A are summarised in Table 1 and in Figure 2 below, and are presented in full at Appendix B.

TABLE 1: Location A - summary of measured noise levels

Date	Time	Sound level dB		
		L _{A90} 1 hour	L _{A90} 15 minutes	L _{Aeq} 1 hour
31.1.23	14:00	57.0		61.6
	15:00	57.0		61.8
	16:00	58.0		62.8
	17:00	58.4		62.7
	18:00	57.7		62.4
	19:00	56.4		61.8
	20:00	55.5		60.2
	21:00	54.4		59.3
	22:00	52.7		57.4
	23:00		50.0	56.4
1.2.23	00:00		48.0	54.6
	01:00		46.2	53.0
	02:00		46.0	53.0
	03:00		47.9	54.1
	04:00		47.8	54.9
	05:00		51.9	58.1
	06:00		55.9	61.1
	07:00	58.8		62.7
	08:00	58.4		62.0
	09:00	58.3		62.9
	10:00	57.6		62.2
	11:00	57.5		62.2
	12:00	58.2		56.2

FIGURE 2: Summary of measured noise levels



- 2.8 Short term attended sample noise measurement were taken at location B, Kinglsey Close, to establish the difference between location A, which was the unattended baseline control measurement location and the noise climate at the closest residential properties to the proposed Aldi site. This information would then be used to determine typical period noise levels for the daytime, evening and night time periods
- 2.9 The noise measurements at location B are presented at Table 2 below.

TABLE 2: Location B – Kinglsey Close

Date	Time	Sound level dB				
		L _{A10}	L _{A90}	L _{Aeq T}	L _{AFmax}	L _{Amin}
31.1.23	22:30	57.2	49.3	53.8	71.2	47.5
	22:45	56.3	48.4	53.0	68.9	46.2
1.2.23	02:00	54.6	45.7	52.3	65.3	42.1
	02:15	54.3	45.9	51.9	64.2	41.8

- 2.10 In view of the measured noise levels at location A and B, the following period background noise levels are considered to be typical the closest residential properties in Kinglsey Close; daytime (0700 to 1900 hours) 52 dB L_{A90}, evening (1900 to 2300 hours) 48 dB L_{A90}, and night time (2300 to 0700 hours) 46 dB L_{A90}. Given that the Aldi store would trade into the evening period, the evening and night time background noise levels shall be used to set the day time and night time background noise levels with regard to the requirements of planning condition 7.

3.0 Assessment of noise from fixed plant equipment

- 3.1 The following plant noise level limits (specific levels) are applicable at the nearest residential properties (in Kingsley Close) to the Aldi plant equipment, as required by planning condition 7.

TABLE 3: Aldi plant specific noise level limits

Specific level limits (dB)	
Daytime	Night time
38 dB (48-10)	36 dB (46-10)

- 3.2 The refrigeration plant is to be located within a plant compound in the Aldi service yard, adjacent to the delivery loading bay on the eastern side of the store. Acoustic screening is provided by the 2.4 metre service yard boundary fence (as indicated at Appendix A). The external plant will comprise of 3x air source heat pumps (ASHPs), a gas cooler, compressor housing, HT and LT condensers, and an AC unit for the manager's office. Ventilation plant is to be located internally, with ventilation grilles on the north east, south east and south west sides of the store. The ventilation plant will comprise of an air handling unit (AHU) with a fresh air intake and exhaust ducts terminating at high level through the facades of the store building and welfare area extract fans to the north east elevation.
- 3.3 The following table contains a schedule of proposed plant for the Aldi store.

TABLE 4: Aldi Reading Gateway proposed plant equipment

Description	Octave band (Hz) sound power levels dB L _w							
	63	125	250	500	1K	2K	4K	8K
AHU Exhaust	76	71	79	78	81	81	78	75
AHU Supply	69	66	76	72	69	70	68	67
Manager office extract	67	69	68	67	65	63	60	53
Staff toilet extract	67	69	68	67	65	63	60	53
Staff room extract	67	69	68	67	65	63	60	53
5x Air source heat pumps*	-	63	63	51	54	51	49	42
Compressor pack	38 dBA at 10 metres							
Gas cooler	45 dBA at 10 metres							
Manager office AC unit	50 dBA at 1 metre							
HT & LT Condensers (each)	44 dBA at 10 metres							

- 3.4 SR uses an environmental 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 noise receptor. The software carries out 'text book' atmospheric side calculations with regard to distance and screening attenuation by referencing relative source and receiver positions.
- 3.5 The height coordinates used in the 'NoysPlot' model have been extrapolated from the Architects elevation drawings and from site observations, and using Google Earth. The horizontal coordinates are referenced from an arbitrary 'x', 'y' position on a grid system.
- 3.6 The software considers these noise sources which are detailed in the noise source input schedule in Appendix C2. Given the high noise climate in the vicinity of the proposed Aldi store, none of the plant is anticipated to exhibit any acoustic characteristics when observed from the receptors in Kinglsey Close.
- 3.7 NoysPlot uses operating time information to calculate noise levels for daytime and night time operation. The time period that the equipment is assumed to be operating is denoted by 'D' to indicate daytime only operation; an 'N' to denote night time usage and 'A' to indicate that the equipment runs all the time. For this assessment it is assumed that most of the equipment operates all of the time.
- 3.8 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_p/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, both single figure A-weighted noise level data and unweighted sound power/pressure level data has been used.
- 3.9 The surface directivity is also assessed for all cases – this depends on the number of adjacent reflective surfaces – the number can be seen in the column headed Q in the input schedule.
- 3.10 A summary of the atmospheric noise calculations for daytime and night time are displayed in Appendices C3 and C4. Calculations for each source to receiver can be made available upon request. These calculations take into account 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.
- 3.11 The input data defining the locations of the noise sources, the receivers and screening are shown in Appendix C2. The NoysPlot noise 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 model the proposed Aldi building and a finite barrier to denote the service yard boundary fence (2.4 metres high).

- 3.12 Calculations have been carried out for the closest residential properties to the site.
- 3.13 The NoysPlot calculations (see Appendices C3 and C4) show the following resultant plant rating noise levels:

TABLE 5: Predicted plant sound levels

Noise sensitive receptor	Predicted noise level dB(A)	
	Daytime	Night time
43 Kingsley Close	32	33
44 Kingsley Close	30	32

- 3.14 In order to achieve the predicted noise levels in Table 5 it is recommended that attenuators are fitted to the atmospheric side of the AHU supply/fresh air inlet. The table below (and the schedule at Appendix C1.2) presents the minimum insertion loss requirements for the recommended attenuators:

TABLE 6: Minimum insertion loss requirements

Equipment name/reference	Insertion loss – Mid frequency octave bands (Hz)							
	63	125	250	500	1K	2K	4K	8K
AHU fresh air inlet	0	0	10	12	15	18	20	20

- 3.15 The predicted plant noise levels are at least 16 dB below the daytime/evening background noise climate and at least 13 dB below the night time background noise climate. BS 4142:2014 explains that where the rating noise level is below the existing background noise climate this situation is indicative of low impact (depending upon context). The predicted specific/rating noise levels are therefore shown to comply with the requirements of condition 7 of planning permission 221908.

4.0 Assessment conclusions

- 4.1 This noise assessment report is seeking the discharge of planning condition 7 of planning permission 221908, for the proposed Aldi store at Reading Gateway, RG2 0GG. Planning condition 7 states:

“7. No mechanical plant shall be installed until a noise assessment of the proposed mechanical plant has been submitted and approved by the Local Planning Authority. The assessment shall be carried out for in accordance with BS4142:2014 methodology. The predicted specific sound level (LAeq,TR) (with reference to BS:4142) as measured at a point 1 metre external to the nearest noise-sensitive facade shall be at least 10dB below the pre-existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation. The predicted rating level, LAr,Tr (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to the nearest noise-sensitive façade (habitable window of a dwelling) shall not exceed the pre-existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation. The plant shall thereafter only be installed in accordance with the assessment and shall thereafter be maintained so that it operates to the same standard.

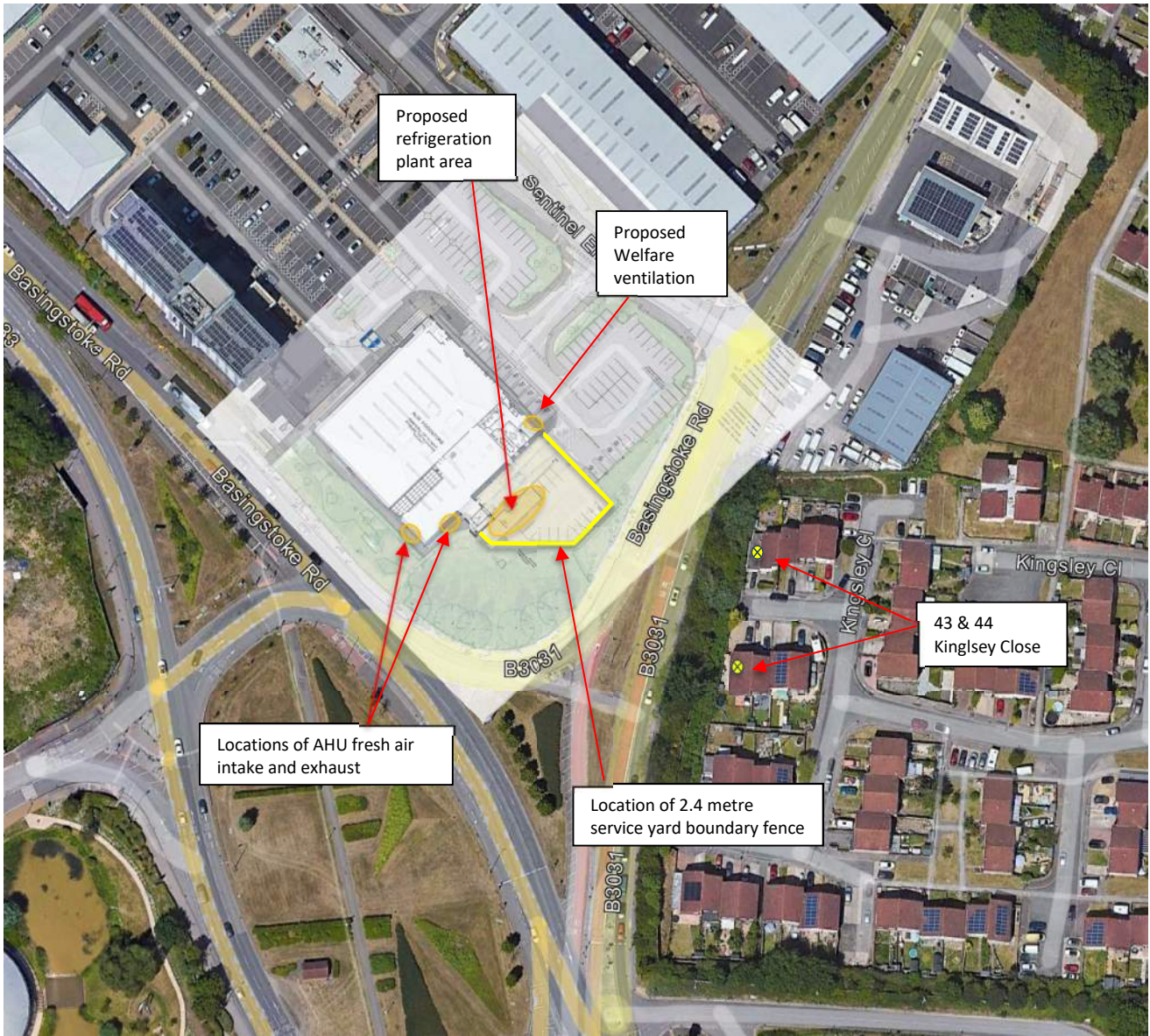
REASON: To safeguard the amenities of the adjoining premises and the area generally, in accordance with Policy CC8 and EN17 of the Reading Borough Local Plan 2019”.

- 4.2 The highest predicted plant specific/rating noise levels at the closest residential properties are 32 dB for the daytime and 33 dB during night time periods. These levels are well below the requirement of planning condition 7 to not exceed 38 dB daytime (48-10) and 36 dB at night (46-10).
- 4.3 This assessment objectively demonstrates that predicted Aldi plant specific/rating noise levels would comply with the requirement of planning condition 7, hence the discharge of this condition is sought.

APPENDIX A

PROPOSED SITE PLAN

Appendix A: Proposed site plan showing noise receptor locations



APPENDIX B

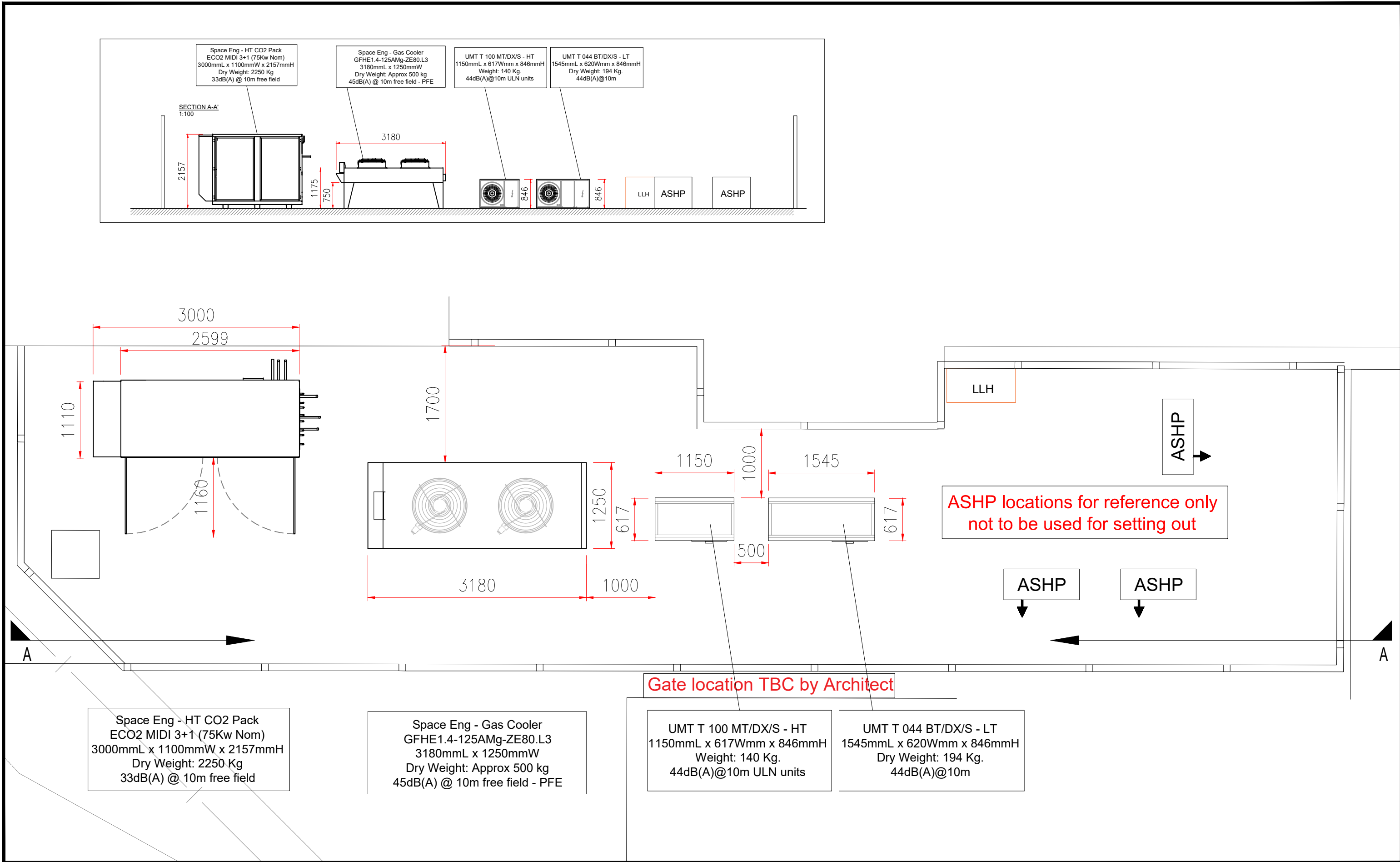
NOISE SURVEY RESULTS

Appendix B1		Title: Noise survey results				
Location A: Measured noise levels boundary of proposed Aldi service yard, Gateway Reading						
Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
31.1.23	13:45	63.2	56.5	60.8	70.7	53.3
	14:00	64.3	57.2	62.1	73.5	54.0
	14:15	63.6	57.1	61.5	75.0	53.3
	14:30	63.8	56.9	61.6	76.1	53.7
	14:45	63.3	56.6	61.1	70.7	52.5
	15:00	63.7	56.9	61.4	72.4	53.0
	15:15	64.4	56.7	62.2	76.9	53.1
	15:30	63.8	57.3	61.6	71.4	53.8
	15:45	64.3	57.2	62.1	71.8	53.3
	16:00	64.0	57.2	62.1	80.2	54.4
	16:15	65.2	58.1	62.9	73.5	53.9
	16:30	65.2	58.6	63.6	86.2	53.6
	16:45	64.5	58.0	62.4	72.4	54.5
	17:00	64.4	58.2	62.1	68.4	54.7
	17:15	64.9	58.8	63.7	85.5	54.8
	17:30	64.2	58.6	62.6	80.1	56.3
	17:45	64.3	58.0	62.3	79.6	55.8
	18:00	64.4	58.1	62.1	71.2	54.4
	18:15	65.0	58.5	63.4	78.2	54.8
	18:30	63.9	56.9	61.8	72.8	53.1
	18:45	64.5	57.3	62.1	78.0	54.0
	19:00	64.5	56.5	61.9	75.7	53.8
	19:15	64.2	56.9	61.4	71.1	54.1
	19:30	64.4	55.8	62.7	79.8	52.9
	19:45	63.4	56.2	61.0	77.3	52.9
	20:00	62.4	55.7	60.8	80.3	53.1
	20:15	62.7	55.7	60.3	75.2	53.1
	20:30	62.2	55.9	59.8	69.4	52.9
	20:45	62.8	54.7	59.9	73.2	51.6
	21:00	62.1	54.9	59.8	74.1	51.6
	21:15	62.2	54.5	59.5	77.8	51.2
	21:30	61.8	53.8	58.8	66.2	51.3
	21:45	62.0	54.5	59.0	69.4	50.8
	22:00	62.6	55.2	59.6	67.1	51.4
	22:15	59.5	53.0	56.7	64.4	50.0
	22:30	59.7	51.6	56.4	66.7	48.5
	22:45	58.9	51.0	55.6	65.5	48.1
	23:00	58.8	50.8	55.8	66.6	48.2
	23:15	59.6	51.3	57.8	77.9	48.2
	23:30	59.2	50.0	55.5	69.4	46.6
	23:45	58.7	50.3	56.1	74.8	47.8
1.2.23	00:00	57.6	49.4	55.3	70.9	45.7
	00:15	57.5	48.0	54.0	63.9	44.6
	00:30	57.1	48.7	54.7	72.9	46.5
	00:45	57.7	48.4	54.3	66.8	45.1
	01:00	57.5	48.6	54.3	68.3	45.6
	01:15	55.1	46.2	51.8	62.3	43.7
	01:30	56.4	46.9	53.1	66.2	43.5
	01:45	55.5	46.5	52.3	66.7	42.5

Appendix B2		Title: Noise survey results				
Location A: Measured noise levels boundary of proposed Aldi service yard, Gateway Reading						
Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
1.2.23	02:00	56.2	46.0	54.1	72.7	43.0
	02:15	54.5	46.4	51.5	63.8	43.2
	02:30	55.8	46.9	52.8	67.6	44.0
	02:45	56.1	47.2	53.1	66.6	43.6
	03:00	56.6	47.9	53.6	67.0	44.5
	03:15	57.1	48.1	54.5	72.4	44.2
	03:30	57.7	48.8	54.5	67.4	46.1
	03:45	56.9	48.6	53.7	66.6	44.3
	04:00	56.1	47.8	53.2	64.6	44.0
	04:15	58.6	49.9	55.3	66.3	46.7
	04:30	57.9	50.4	55.3	70.2	46.8
	04:45	58.2	50.6	55.3	67.6	47.6
	05:00	59.8	51.9	57.0	69.6	47.2
	05:15	60.4	52.9	57.4	66.4	49.3
	05:30	61.7	54.2	59.0	68.6	51.0
	05:45	61.5	53.7	58.8	71.2	50.9
	06:00	63.2	55.9	60.5	71.7	52.6
	06:15	63.3	56.5	60.4	67.9	53.8
	06:30	63.9	57.0	61.5	74.7	54.0
	06:45	64.1	58.4	61.9	68.5	55.0
	07:00	65.1	58.4	62.9	76.4	55.8
	07:15	64.9	58.6	62.8	71.4	55.1
	07:30	65.1	59.6	63.2	77.5	57.1
	07:45	64.2	58.7	62.0	79.0	56.1
	08:00	64.0	59.0	62.1	75.9	56.4
	08:15	64.7	58.2	62.2	72.8	54.9
	08:30	63.5	58.4	61.5	73.7	56.6
	08:45	63.9	58.1	62.0	73.0	54.8
	09:00	65.0	57.8	62.4	75.8	54.3
	09:15	64.5	58.8	62.2	74.2	56.4
	09:30	65.5	58.9	64.6	80.4	55.9
	09:45	64.0	57.5	61.6	71.6	54.9
	10:00	64.6	57.0	62.7	85.0	54.1
	10:15	64.1	57.5	61.7	74.1	53.7
	10:30	64.7	57.9	62.3	75.5	53.6
	10:45	64.4	57.8	62.0	72.0	54.7
	11:00	64.3	57.9	61.9	73.6	54.4
	11:15	64.9	57.3	62.5	75.6	54.3
	11:30	64.9	57.7	62.6	74.9	54.2
	11:45	64.4	57.1	61.7	73.7	54.2
	12:00	64.6	58.2	62.2	72.6	54.5
Location B: Measured noise levels Kingsley Close						
Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
31.1.23	22:30	57.2	49.3	53.8	71.2	47.5
	22:45	56.3	48.4	53.0	68.9	46.2
1.2.23	02:00	54.6	45.7	52.3	65.3	42.1
	02:15	54.3	45.9	51.9	64.2	41.8

APPENDIX C

REFRIGERATION AND VENTILATION SCHEME DRAWINGS



REV	DATE	DESCRIPTION	OWN	ENG
C01	02.01.2023	FINAL ISSUE	RS	CI

VENTILATION NOTES

1. ALL DUCT RUNS AND INTAKE/EXTRACT POSITIONS TO BE CONFIRMED AND SITE MEASURED PRIOR TO MANUFACTURE.
2. THE TYPE, ORIENTATION & HEIGHT OF THE ROOF WILL DETERMINE ROOF OR WALL INTAKE/EXHAUST LOCATIONS.
3. ALL BUILDERS WORK OPENINGS TO BE CONFIRMED BY MADE CONTRACTORS.
4. A CO₂ SENSOR TO BE PROVIDED FREE ISSUE BY THE BMS SUPPLIER INSTALLED BY MECHANICAL CONTRACTOR.
5. THE MINIMUM HEAD HEIGHT TO UNDERSIDE OF DUCT IN WAREHOUSE SHALL BE 3,500mm AFFL.
6. 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 PROVIDED.
7. THE HEAT RECOVERY UNIT (HRV) NEED TO BE INSTALLED BEFORE THE COLD ROOMS ARE BUILT. THE HRV IS BOTTOM ACCESSIBLE – UNIT TO BE RAISED TO ALLOW FILTER CHANGING.
8. DOOR HEATERS ARE TO BE MOUNTED ABOVE THE INNER LOBBY DOORS.
9. ALL EGGCRATE CORE GRILLS WILL BE OF GALV MANUFACTURE OR EQUAL & APPROVED. COLOUR FINISH: WHITE.
10. SALE AREA SUPPLY DIFFUSERS WILL BE WATERLOO RW1380 JET DIFFUSERS
11. SERVICES SUPPORTS TO BE CO-ORDINATED WITH OTHER TRADE TO COMBINE WHERE POSSIBLE.



ELECTRIC DUCT HEATER
MANUFACTURER: AAH LTD
DIAMETER: 450mm
MODEL: CH50C3 CIRCULAR HEATER (AAH/8)
CAPACITY: 9kW/400V
C/W TEMPERATURE CONTROLLER, EQUIPPED WITH:
• SOLID STATE RELAY (SSR)
• AIR FLOW SWITCH
• OVERHEAT CUT-OUT
• SUPPLY FAN1 (TEMPERATURE CONTROLLED)
• SUPPLY FAN2 (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

- 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
- PROTECT AIR FLOW RATE: 961.2 l/s (3,460 m³/h)
- DIMENSIONS: (WxLxH)=2,160x2,910x544mm
- WEIGHT=590kg
- CONNECTIONS=500x380mm

HEAT RECOVERY UNIT (HRV)

MODEL: HR3500



NOTE
FOR DATA OF THE CEILING FAN-COIL UNITS PLEASE REFER TO DRAWING W62A.

ODH-1 & ODH-2 OVERDOOR HEATERS (AIR CURTAINS)

MANUFACTURER: BIDDLE
MODEL: OF 1-150-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): 9-10.6-12.3kW (29°C ENTERING AIR & 60/40°C LTHW F&R)
DIMENSIONS (WxDxH): 1,500x570x270mm
RATED POWER INPUT: 0.77kW/230V
NOISE LEVEL: 48 db(A) @ MEDIUM SPEED
WEIGHT: 50kg

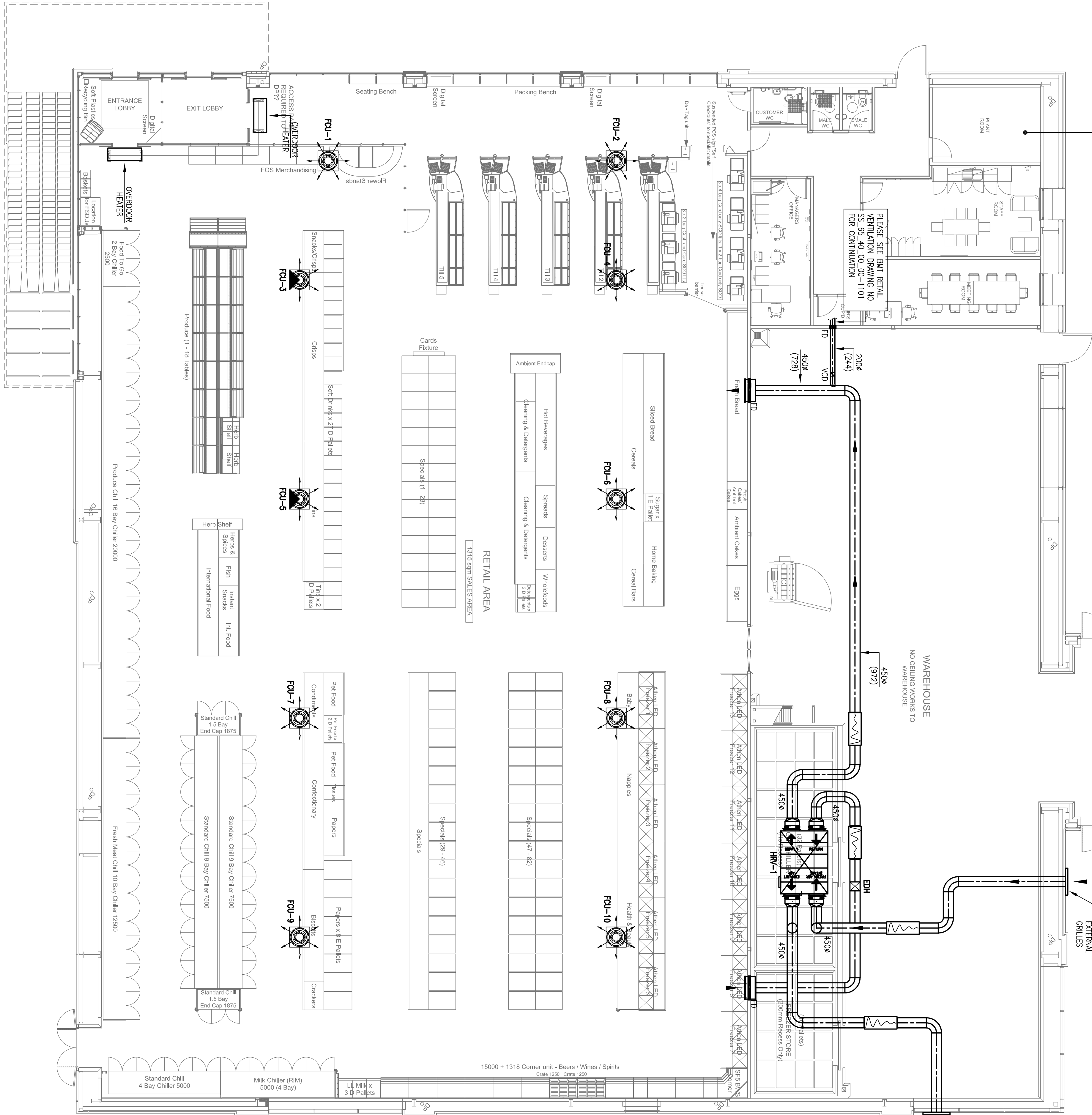
- BIDDLE HEAT RECOVERY (HRV) UNIT, TYPE HR3500.
- FLAT PLANTROOM, INSPECTION/MAINTENANCE
- THROUGH BOTTOM ACCESS
- EC FAN MOTORS (DC CONTROLLED 5-10V)
- CAPACITY: 972 l/s (3,500 m³/h)
- HEAT EFFICIENCY=~/76.5%
- SUPPLY AIR FAN max 3,500 m³/h @ 300 Pa-SPEED 100% (10 VDC)
- POWER INPUT 1.35kW/230 V/5.56 A, SFP=+1.37.
- EXTRACT AIR FAN max 3,500 m³/h @ 150 Pa-SPEED 100% (10 VDC)
- POWER INPUT 1.29 kW/230 V/5.14 A, SFP=+1.32.
- CONNECTIONS=500x380mm
- 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
- PROTECT AIR FLOW RATE: 961.2 l/s (3,460 m³/h)
- DIMENSIONS: (WxLxH)=2,160x2,910x544mm
- WEIGHT=590kg
- CONNECTIONS=500x380mm

SYMBOLS LEGEND

- 450ø SOUND ATTENUATOR (CROSSSTAK) FITTED ON 450mm AIR DUCT
- 125ø/132 ROUND AIR DUCT 125ømm, CARRYING 32 1/3 OF AIR
- VDO VOLUME CONTROL DAMPER FITTED ON CIRCULAR AIR DUCT
- FD FIRE DAMPER INSTALLED IN CIRCULAR AIR DUCT
- FIRE RATED 1-1-1 HOUR, AS PER ARCHITECTS FIRE STRATEGY PLANS
- RETURN AIR GRILLE – GLIBERTS SK 1000x600mm WITH REMOVABLE CORE
- SUPPLY AIR GRILLE – GLIBERTS SK 1000x600mm
- LTHW CEILING RECIRC CASSETTE DIFFUSER WORKING
- CEILING FAN-COIL UNIT WITH 6-DIRECTION DIFFUSER – 2 DIRECTIONS ARE BLANKED OFF

NOTE
PLEASE REFER TO DRAWING W62Z FOR VENTILATION LAYOUT OF THE ADMINISTRATION & WELFARE AREA.

PLEASE SEE BMT RETAIL VENTILATION DRAWING NO. SS.65.40.00.00-1101 FOR CONTINUATION



Client	AAH LTD
BMT Project No./Project Region	B3873 / A/DI SWINDON
Project Address	Swindon
Reading Gateway	Swindon
Sentinel End	Swindon



MECHANICAL INSTALLATION RETAIL AREA VENTILATION GA

Job No.	Client	Zone	Level	Type	Room
XXXX	BMT	ZZ	ZZ	DR	M
System Description	Swindon	Swindon	Swindon	Swindon	Swindon
SS.65.40.00.00-1101	A5	C01			
Down	Up	Down	Up	Down	Up
PS	CT	02.01.2023	1:100	AI	

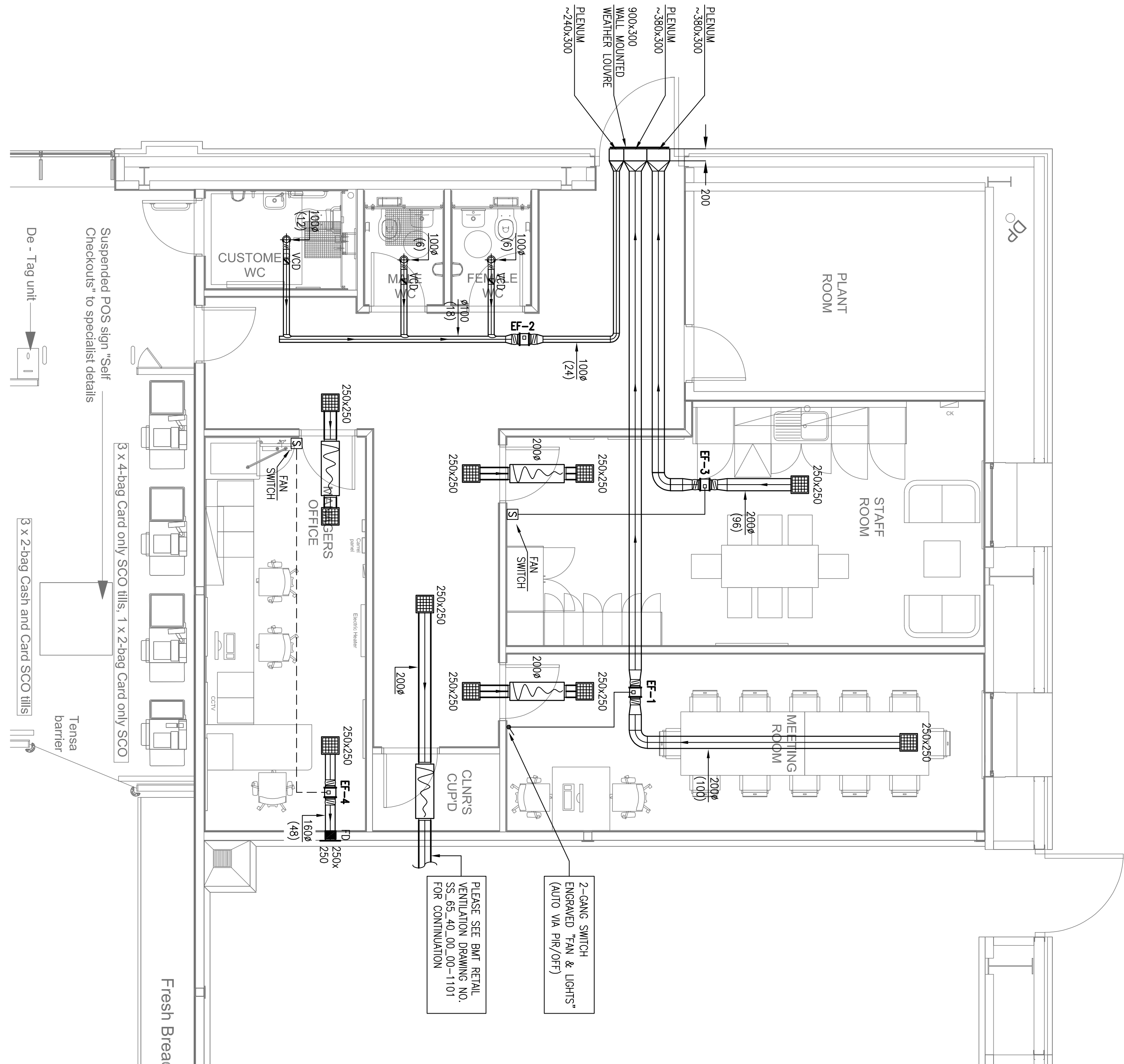


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REV	DATE	DESCRIPTION	DRW	ENG
C01	03.01.2023	FIRST ISSUE	RS	CT

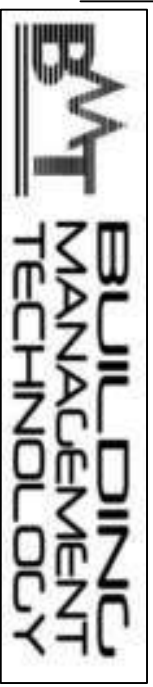
SYMBOLS LEGEND	
	AIR EXTRACT/SUPPLY VALVE 100ø, 150ø & 200ømm
	SOUND ATTENUATOR (CROSSSTAK) FITTED ON 250ømm AIR DUCT
	ROUND AIR DUCT 125ømm, CARRYING 32 1/s OF AIR
	VOLUME CONTROL DAMPER FITTED ON CIRCULAR AIR DUCT
	FIRE DAMPER INSTALLED IN CIRCULAR AIR-DUCT, FIRE RATED 1-1½ HOUR, AS PER ARCHITECTS 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 P80 160EC CIRCULAR DUCT EXTRACT FAN, 160øx220mm, CHARACTERISTICS: • SPEED CONTROL WITH SPEED CONTROL • INTEGRATE MOTOR PROTECTION • ENCLOSURE CLASS IP44 • CAN BE INSTALLED IN ANY POSITION • WEIGHT: 1.6kg • SOUND PRESSURE: 47 db(A) @ 3m.



- NOTES**
- FANS EF-2, EF-3 & EF-4 WILL BE ACTIVE DURING STORE OCCUPATION.
 - FANS EF-2 & EF-3 TO BE SWITCHED VIA "STAFF LEVEL" LIGHTING AND SHALL INCORPORATE "RUN ON" TIMERS.
 - FANS EF-1 & EF-4 TO BE SWITCHED VIA "STAFF LEVEL" LIGHTING, WITH WALL MOUNTED OVERRIDE SWITCH AND SHALL INCORPORATE A "RUN ON" TIMER.
 - ALL FANS WILL BE OF SYSTEMAIR MANUFACTURE, TYPE P80 160EC.
 - ALL EGGCRATE CORE GRILLES WILL BE OF GOL MANUFACTURE OR EQUAL & APPROVED.
 - COLOUR FINISH: WHITE
 - ALL WEATHER LOUVERES WILL OF GOL MANUFACTURE TYPE W050-30mm OR EQUAL & APPROVED.
 - SPINE WALL GRILLES WILL BE GILBERTS SK LINEAR BAR GRILLES WITH REMOVABLE CORE FINISHED IN WHITE

Client		ALDI	
Aldi Stores Ltd.			
B3873 / Aldi Swindon			
Project Address			
READING GATEWAY SENTINEL END			
Drawing Title			
MECHANICAL INSTALLATION WELFARE AREA VENTILATION SERVICES			
Job No.	Client	Zone	Type
XXXX	BMT	A1	DR
System Description	Drawing No.	Scale	Revised
SS.65.40.00.00-1107	A5	1:50	C01
Drawn By	Project Manager	Date	Scale
PS	CT	03.01.2023	1:50
			A1



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APPENDIX D

‘NOYSPLOT’ NOISE MODEL: PLANT NOISE PREDICTIONS

Client: Aldi Stores Limited				Appendix D1.1								Page: 1 of 1	
Project: Aldi Reading Gateway				Project no: 2321678									
Consultant: K J Metcalfe				Date: 10 February 2023									
Sound power levels (Lw) & sound pressure levels (Lp) for fans & other equipment													
Equipment name/reference	Lw/ Lp	Dist. (m)	On time D/N/A	Mid-frequency Octave Bands (Hz)									
				63	125	250	500	1k	2k	4k	8k		
Compressor housing	Lp	10	A	38	dBA								
Gas Cooler	Lp	10	A	45	dBA								
HT condenser unit	Lp	10	A	44	dBA								
LT condenser unit	Lp	10	A	44	dBA								
ASHP #1	Lw		A	0	63	63	51	54	51	49	42		
ASHP #2	Lw		A	0	63	63	51	54	51	49	42		
ASHP #3	Lw		A	0	63	63	51	54	51	49	42		
ASHP #4	Lw		A	0	63	63	51	54	51	49	42		
ASHP #5	Lw		A	0	63	63	51	54	51	49	42		
Staff room extract fan	Lw		A	67	69	68	67	65	63	60	53		
Staff toilet extract fan	Lw		A	67	69	68	67	65	63	60	53		
Managers office extract fan	Lw		A	67	69	68	67	65	63	60	53		
AHU supply	Lw		A	76	71	79	78	81	81	78	75		
AHU exhaust	Lw		A	69	66	76	72	69	70	68	67		
Managers office	Lp	1	D	50	dBA								

Notes:

- Lw/Lp
Lw means sound power level (dB)
Lp means sound pressure level at the stated distance (dB@m)
- On times (On.time D/N/A):
D (Day) means that the fan/equipment could operate at any time between 0700 and 2300 hours
N (Night) means that the fan/equipment could operate at any time between 2300 and 0700 hours
A (All) means that the fan/equipment could operate at any time during the day and night

[illegible]

Appendix D2: NoysPlot input data, source, receptor and barrier data

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

Filename: p:\23 - Projects\2321678 Aldi Reading Gateway-KJM\NoysPlot\Aldi Reading Gateway plant
Date: 10 February 2023
Entries by: K J Metcalfe
Project no: 2321678
Project title: Aldi Reading Gateway
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 d/n/a	Lp/ Lw	dBA Y/N	Dist (m)	Noise level - Octave band centre frequency Hz							
	X m	Y m	Z m	Amm	Bmm	Ang.							63	125	250	500	1k	2k	4k	8k
Compressor housing	154.0	116.0	2.2	0	0	0	100	2	A	P	Y	10.0	38 dBA							
Gas Cooler	155.5	120.0	1.2	0	0	0	100	2	A	P	Y	10.0	45 dBA							
HT condenser unit	155.5	123.0	0.8	0	0	0	100	2	A	P	Y	10.0	44 dBA							
LT condenser unit	155.5	125.0	0.8	0	0	0	100	2	A	P	Y	10.0	44 dBA							
ASHP #1	154.0	128.0	1.2	0	0	0	100	2	A	W	N	0.0	n/a	63	63	51	54	51	49	42
ASHP #2	156.0	130.0	1.2	0	0	0	100	2	A	W	N	0.0	n/a	63	63	51	54	51	49	42
ASHP #3	156.0	130.0	1.2	0	0	0	100	2	A	W	N	0.0	n/a	63	63	51	54	51	49	42
ASHP #4	154.0	132.0	1.2	0	0	0	100	2	A	W	N	0.0	n/a	63	63	51	54	51	49	42
ASHP #5	156.0	132.0	1.2	0	0	0	100	2	A	W	N	0.0	n/a	63	63	51	54	51	49	42
Staff room extract fan	139.0	146.0	2.5	0	0	0	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53
Staff toilet extract fan	139.0	146.0	2.5	0	0	0	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53
Managers office extract fan	139.0	146.0	2.5	0	0	0	100	1	A	W	N	0.0	67	69	68	67	65	63	60	53
AHU supply	144.5	110.0	3.5	0	0	0	100	1	A	W	N	0.0	76	71	79	78	81	81	78	75
AHU exhaust	139.0	99.8	3.5	0	0	0	100	1	A	W	N	0.0	69	66	76	72	69	70	68	67
Managers office	144.0	138.0	1.0	0	0	0	100	2	D	P	Y	1.0	50 dBA							

NOTES: n/a = data not available in this octave band

Receptor data - description and co-ordinates

Receptor description	Co-ordinates			DNA
	X m	Y m	Z m	
43 Kingsley Close	216.0	161.0	4.5	N
44 Kingsley Close	225.0	141.0	1.5	D
44 Kingsley Close	225.0	141.0	4.5	N

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	100.0	100.0	7.0	100.0	145.5	7.0
Ring barrier	100.0	145.5	7.0	144.0	145.5	7.0
Ring barrier	144.0	145.5	7.0	144.0	100.0	7.0
Ring barrier	144.0	100.0	7.0	100.0	100.0	7.0
Finite Barrier	144.0	113.0	2.4	157.0	113.0	2.4
Finite Barrier	157.0	113.0	2.4	173.0	130.0	2.4
Finite Barrier	173.0	130.0	2.4	173.0	146.0	2.4
Finite Barrier	173.0	146.0	2.4	144.0	146.0	2.4

Appendix D3: Predicted daytime noise levels

Overall receptor listings

Period: Day time

Overall daytime plant noise levels (dB)	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
43 Kingsley Close	48	38	32	28	25	23	20	17	32
44 Kingsley Close	47	37	31	25	23	20	15	15	30

Source noise levels at receiver: 43 Kingsley Close

Period: Day time

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Managers office extract fan	21	23	22	21	19	17	14	7	24
Staff toilet extract fan	21	23	22	21	19	17	14	7	24
Staff room extract fan	21	23	22	21	19	17	14	7	24
Gas Cooler	43	33	25	18	13	10	7	7	23
AHU supply	26	22	20	16	17	15	9	13	22
HT condenser unit	42	31	23	16	11	7	5	4	22
LT condenser unit	42	31	23	16	11	7	5	4	22
Compressor housing	36	25	18	12	8	7	6	6	17
AHU exhaust	12	7	14	7	1	2	0	0	10
ASHP #5	0	16	16	2	4	0	0	0	9
ASHP #4	0	15	15	2	3	0	0	0	8
ASHP #1	0	16	15	2	3	0	0	0	8
ASHP #2	0	15	15	1	3	0	0	0	8
ASHP #3	0	15	15	1	3	0	0	0	8
Managers office	15	2	0	0	0	0	0	0	0
Total Free field Lp and dBA	48	38	32	28	25	23	20	17	32

Source noise levels at receiver: 44 Kingsley Close

Period: Day time

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Gas Cooler	43	32	24	17	12	8	6	5	23
AHU supply	27	22	19	16	17	15	9	13	22
LT condenser unit	42	31	23	15	10	7	4	3	21
HT condenser unit	41	31	23	15	10	6	3	3	21
Managers office extract fan	18	19	18	16	14	11	7	0	19
Staff toilet extract fan	18	19	18	16	14	11	7	0	19
Staff room extract fan	18	19	18	16	14	11	7	0	19
Compressor housing	36	25	18	12	8	7	6	6	17
AHU exhaust	14	9	17	10	4	2	0	0	12
ASHP #5	0	15	15	1	3	0	0	0	8
ASHP #4	0	15	15	2	3	0	0	0	8
ASHP #1	0	15	15	2	3	0	0	0	8
ASHP #2	0	15	15	1	3	0	0	0	8
ASHP #3	0	15	15	1	3	0	0	0	8
Managers office	15	2	0	0	0	0	0	0	0
Total Free field Lp and dBA	47	37	31	25	23	20	15	15	30

Appendix D4: Predicted nighttime noise levels

Overall receptor listings

Period: Night-time

Overall night time plant noise levels (dB)	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
43 Kingsley Close	48	38	33	28	26	25	22	21	33
44 Kingsley Close	48	38	32	27	25	23	20	18	32

Source noise levels at receiver: 43 Kingsley Close

Period: Night-time

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Gas Cooler	43	33	26	20	17	16	15	16	26
Staff room extract fan	21	23	22	21	19	17	14	7	24
Managers office extract fan	21	23	22	21	19	17	14	7	24
Staff toilet extract fan	21	23	22	21	19	17	14	7	24
LT condenser unit	42	32	25	18	15	13	11	11	24
HT condenser unit	42	32	25	18	15	13	11	11	24
AHU supply	27	24	20	16	17	15	9	13	22
Compressor housing	36	26	19	13	11	12	13	15	21
ASHP #5	0	17	17	5	8	4	2	0	13
ASHP #4	0	16	16	4	7	4	1	0	12
ASHP #1	0	16	16	4	7	4	1	0	12
ASHP #3	0	16	16	4	7	3	1	0	12
ASHP #2	0	16	16	4	7	3	1	0	12
AHU exhaust	12	7	14	7	1	2	0	0	10
Total Free field Lp and dBA	48	38	33	28	26	25	22	21	33

Source noise levels at receiver: 44 Kingsley Close

Period: Night-time

Plant item	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Gas Cooler	43	33	25	19	15	12	10	9	24
LT condenser unit	42	32	24	18	14	11	9	8	23
Staff room extract fan	18	20	19	18	18	16	13	6	23
Staff toilet extract fan	18	20	19	18	18	16	13	6	23
Managers office extract fan	18	20	19	18	18	16	13	6	23
HT condenser unit	42	32	24	17	13	10	8	7	23
AHU supply	27	23	20	16	17	15	9	13	22
Compressor housing	36	26	18	12	9	8	9	11	19
AHU exhaust	14	9	17	10	4	2	0	0	12
ASHP #1	0	16	16	4	7	3	0	0	12
ASHP #4	0	16	16	4	7	3	0	0	12
ASHP #5	0	16	16	4	6	3	0	0	11
ASHP #2	0	16	16	4	6	3	0	0	11
ASHP #3	0	16	16	4	6	3	0	0	11
Total Free field Lp and dBA	48	38	32	27	25	23	20	18	32

APPENDIX E

ACOUSTIC TERMINOLOGY

Acoustic Terminology

- E1 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 dB + 50 dB = 53 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.
- E2 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.
- E3 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).
- E4 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 .
- E5 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.
- E6 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 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.

- E7 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.

- E8 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:

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