

MEMO

TO	Knowsley Metropolitan Borough Council	DATE	05/12/2025
FROM	RED Engineering Design	COPY	DWD
TITLE	Ventilation / Extraction Statement		

ACRONYMS LIST

AHU – Air Handling Unit

A central system component that conditions and circulates air as part of an HVAC system, typically including filters, heating/cooling coils, and fans.

ASHP – Air Source Heat Pump

A system that extracts heat from the outside air and transfers it indoors for heating, or reverses the process for cooling. It is an energy-efficient alternative to traditional heating systems.

1.0 SUMMARY

The ventilation system will comprise the following systems:

1. **6 No. AHUs** located internally to serve the warehouse and mezzanine spaces.
2. **6 No. ASHPs** positioned externally to support the AHUs.
3. **1 No. Extract fan** installed internally to serve the mezzanine toilet block.

New external louvres are proposed to provide intake and exhaust air for both the existing warehouse, the new mezzanine area and new welfare areas.

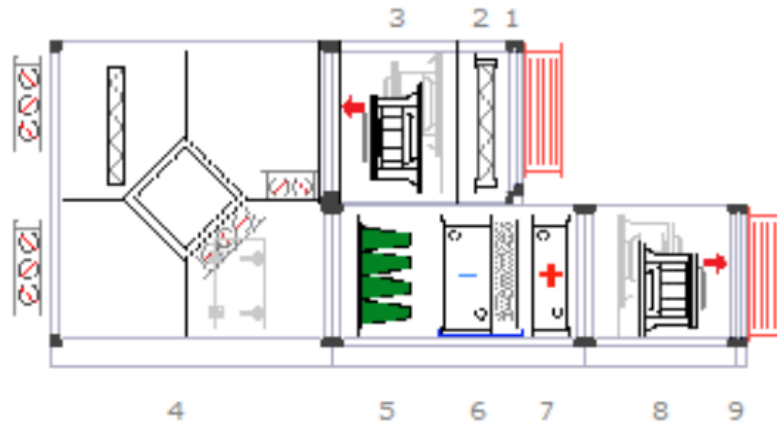
All systems will be designed in compliance with Building Regulation Approved Document Part F to ensure adequate fresh air provision.

All plant and louver locations are indicated on the architect's planning drawings.

2.0 WAREHOUSE VENTILATION – AHU

The proposed AHUs will be located internally within the warehouse area in the plant deck. Typical dimensions and noise data provided below.

2.1 Dimensions



Length	6120	mm
Width	4995	mm
Height	120+4635+135	mm

2.2 Acoustic data

2.2.1 Supply Fan Noise Data

	FAN SOUND POWER LEVEL								
<i>F [Hz]</i>	63	125	250	500	1000	2000	4000	8000	
<i>Outlet [dB]</i>	86	102	91	91	88	85	81	77	
<i>Inlet [dB]</i>	79	102	90	82	80	76	72	72	

2.2.2 Return Fan Noise Data

	FAN SOUND POWER LEVEL								
<i>F [Hz]</i>	63	125	250	500	1000	2000	4000	8000	
<i>Outlet [dB]</i>	92	96	91	92	87	84	80	80	
<i>Inlet [dB]</i>	91	98	90	83	79	76	73	77	

2.2.3 Sound Power Level

SOUND POWER LEVEL

Octave band (Hz)	63	125	250	500	1000	2000	4000	8000	Tot.dB(A)
Lw at fresh air inlet [dB]	67	90	73	63	57	44	29	23	74
Lw at supply air outlet [dB]	86	102	91	91	88	85	81	78	94
Lw at extract air inlet [dB]	90	97	89	82	78	75	71	75	87
Lw at extract air outlet [dB]	86	89	83	84	79	71	65	65	85
Lw airborne [dB]	76	91	79	78	75	68	52	44	81
Sound pressure measured at 1 m distance in free field condition (Q=2)									62 dB(A)

Tolerance on radiated sound power level Lw: +3 dB / Tolerance on level openings Lw: +5 dB @125 Hz, +3 dB @250 - 8000 Hz

The proposed Air Source Heat Pumps connected to the Warehouse AHUs will be located externally to the warehouse. Typical dimensions and noise data provided below.

3.0 WAREHOUSE VENTILATION – ASHP

The proposed ASHPs will be located externally to connected to internal AHUs. Typical dimensions and noise data provided below.

3.1 Dimensions

DIMENSIONS FOR THE UNIT EXCLUDING ACCESSORIES

Length	6313	mm
Width	2264	mm
Height	2402	mm
Operating weight	4589	kg

3.2 Acoustic Data

ACOUSTIC DATA

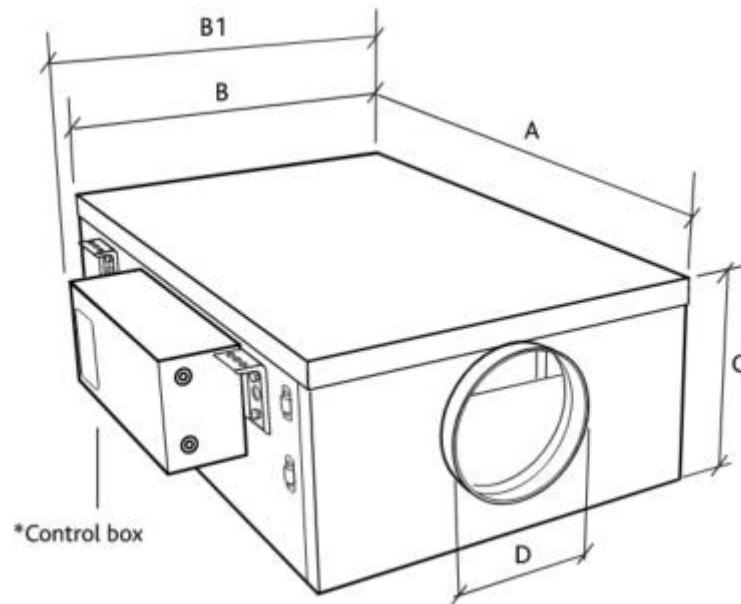
	Spectrum per octave band								Global sound power level dB(A)	Global sound pressure level 10 m dB (A)
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 HZ		
A	87.7	95.3	93.4	93.2	90.5	93.3	82.1	77.6	97.4	-
B	59.7	67.3	65.4	65.2	62.5	65.3	54.1	49.6	-	69.4
C	55.2	62.8	60.9	60.7	58	60.8	49.6	45.1	-	64.9

A: Global sound power level measured in compliance with ISO STANDARD 3744 at nominal operating point 12/7/35 °C
B: Hemi-spheric (Value only given for indication)
C: Enveloping surface (Value only given for indication)

5.0 TOILET EXTRACT

The proposed extract will be located internally within the toilet in the ceiling void. Typical dimensions and noise data provided below.

5.1 Dimensions



Fan Code	Dim A +Spigot Length (inc.85mm)	Dim B1 +Control (inc.108mm)	Spigot D (dia)	Weight (Kg)
AVS2	615	700	535	643
			281	24

5.2 Acoustic Data

ELECTRICAL & SOUND																
Curve/ Code	Duct conn.	Supply (V/Freq Hz/Phase)	FLC (amps)	SC (amps)	Input Power (Max) (W)	Fan Speed (Nominal)	1. Unweighted induct inlet octave band Sound Power level - dB re 1pW 2. Unweighted induct outlet octave band Sound Power level - dB re 1pW 3. Casing radiated octave band Sound Power level - dB re 1pW								*Casing Radiated Free Field dBA @ 3m (Spherical Radiation)	
							Frequency (Hz)									
							63	125	250	500	1K	2K	4K	8K		
AVS2	200	230/50/1	1.4	1.4	170	4000	1	79	75	69	69	66	62	58	56	
							2	81	77	69	69	69	65	59	57	
							3	67	59	49	40	31	27	29	23	26

6.0 EXTERNAL LOUVRES

The external louvres proposed are standard ventilation louvres with 50% free area and horizontal blades. An example is illustrated below.

