

Reference: Saltbox Unit 1

Project No: 1818341

Date: 23rd March 2022

Technical Note

Re: Unit 1, Saltbox, Bognor Regis. Assessment of sound emissions from plant noise to the local neighbourhood and discharge of Planning Condition 20

Introduction

- 1 This Technical Note has been prepared by Sharps Redmore.
- 2 The purpose of this assessment is to gauge whether the sound levels for external plant, the details of which are shown as typical outdoor units for the type of applications for Unit 1, would satisfy the recommendations in Planning Condition 20.

C20. Noise

Noise Reports shall be submitted with the applications for reserved matters for Unit 1 and Unit 3 and the recommendations for approval in writing by the Local Planning Authority and the recommendations shall be implemented prior to first occupation of Unit 1 and Unit 3 on the Part 2 Development

The Planning noise advice document for Sussex (March 2021) contains the following guidance:

3.2 Guidelines and Criteria

3.2.1. The rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014 + A1: 2019.

- 3 A noise survey has been previously undertaken by Sharps Redmore to accompany the planning application. This determined existing background and ambient levels at the boundary to the nearest noise sensitive receptors to the north of the site on Shripney Road at approximately 300m, over approximately a 24-hour period. A similar survey provided data for the Caravan Park to the south of the site at approximately 100m. The typical ambient and background levels as measured at nearest noise sensitive receptors to be as follows in tables 1 and 2:

Table 1: Survey Summary (representative of nearest residential property at Shripney Road)

Measurement Period	Measured Free-Field Noise Level, dB			
	L _{Aeq,T}	L _{A10,15m} (range)	L _{A90,15m} (range)	L _{Amax} (range)
Daytime	55 dB	53-60 dB	35-50 dB Typical 48 dB	64-79 dB
Night Time (2300-0700)	51 dB	40-61 dB	25-45 dB Typical 34 dB	60-80 dB

Table 2: Long Term Survey Results- Southern Boundary: Rowan Caravan Park

Measurement Period	Measured Free-Field Noise Level, dB			
	L _{Aeq,T}	L _{A10,15m} (range)	L _{A90,15m} (range)	L _{Amax} (typical)
Daytime	56 dB	48-71 dB	35-58 dB Typical 53 dB	66 dB
Night Time (2300-0700)	52 dB	30-72 dB	25-56 dB Typical 39 dB	63 dB

- 4 Attended monitoring was undertaken over representative periods for day and night time over the 13th-14th July 2017. Monitoring position was were chosen to be representative of the proposal site and the nearest residential properties on Shripney Road, approximately 3000m to the north of the proposal site, together with consideration of the caravan park to the south at approximately 100m. The noise climate at both sites was dominated by road traffic noise.

The Development

- 5 Technical data has been provided by the applicants for Mitsubishi outdoor units for heat pumps and A/C units serving the proposal. This data is shown at Appendix A and has been used to inform this assessment and would be typical for the type of development. To provide robust assessment the models operating in worst-case heat mode has been selected from the range of units.

- 6 The distance from the plant elevation to the facades of the residential receptors to the north is around 300 metres and around 100m to the caravan park to the south.

The Plant

- 7 In summary there are six items of plant sited externally, serving the individual units within Unit 1.

The total sound power level for the units has been calculated from worst case heat mode plant data supplied and shown at Appendix A.

- 8 Calculations to the noise sensitive receptors to the north and south have been made using the sound power levels and using the equation $SPL = SWL - 20\log(r) - 8$. (Where $r=300$ and 100 respectively) and SPL provided to give the cumulative SPL for the operation.
- 9 Table 3 sets out the procedure for predicting the plant sound level at 300m at the nearest property on Shripney Road to the north and Table 3 sets out the plant sound level at the caravan park to the south. This assumes all plant is running simultaneously. To provide robust assessment we have considered the Sussex criteria of not exceeding existing background levels measured at the survey as shown below in tables 3 and 4. A conservative 10-15 dB screening effect has been assumed for the intervening large warehouse type buildings between the proposal and the receptor. An acoustic fence is proposed for the neighbouring Unit 9 to the south of the site and a similar conservative assumption is made.

Table 3: Cumulative Proposed Plant. Sound level prediction at nearest residential on Shripney Road at approximately 300m.

	Predicted noise level	
	Day (0700-2300)	Night (2300-0700)
Total Sound Power Level (SWL) 6 units	95 dBA	95 dBA
Distance attenuation ($r=300$). $SPL = SWL - 20\log(r) - 8$	-57	-57
Resultant External	38 dBA	38 dBA
Screening effect	-10dB	-10dB
Corrected Resultant	28dBA	28dBA
Typical Background From Table 1 L_{A90}	48 dBA	34 dBA
Difference	-20	-6
Sussex Noise Policy Requirement	48 dBA	34 dBA
Comply with Requirement and Condition	YES	YES

Table 4: Cumulative Proposed Plant. Sound level prediction at Rowan Caravan Park to the south at approximately 100m

	Predicted noise level	
	Day (0700-2300)	Night (2300-0700)
Total Sound Power Level (SWL) 6 units	95 dBA	95 dBA
Distance attenuation (r=100). $SPL = SWL - 20\log(r) - 8$	-48	-48
Resultant External	47 dBA	47 dBA
Screening effect	-10dB	-10dB
Corrected Resultant	37dBA	37dBA
Typical Background From Table 2 L_{A90}	53 dBA	39 dBA
Difference	-27	-2
Sussex Noise Policy Requirement	53 dBA	39 dBA
Comply with Requirement and Condition	YES	YES

- 10 The expectation is that the totality of all plant operating at their highest sound output quoted, and simultaneously, would be below existing background levels for both day and night time periods at the noise sensitive receptors to the north and south of the proposal. The reality of operational logistics would render this situation of all plant operating simultaneously unlikely, but provides robust assessment.
- 11 The planning condition 20 refers to a scheme to control noise being submitted and the Sussex Noise Policy recommends that any plant should not exceed existing background levels.
- 12 Given typical background levels, the operations during day and night time. Given existing ambient levels, distance involved, magnitude of difference and absolute levels it is not considered necessary to apply any feature corrections.
- 13 It is concluded that sound levels would be acceptable for the typical external plant associated with the proposal, satisfying the requirements of the condition, enabling condition 20 to be discharged.

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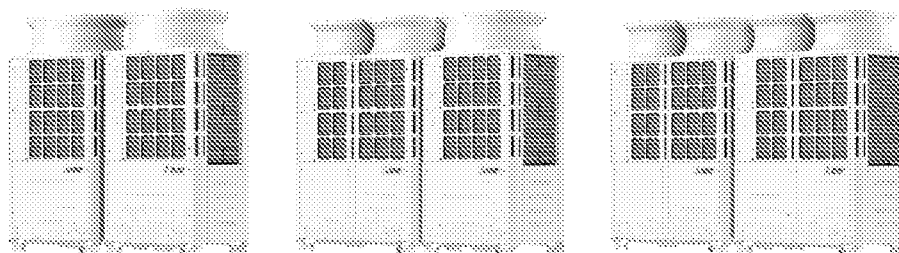


APPENDIX A

DATA SHEETS



Units C and D



		PURY-P600YSNW-A1		PURY-P600YSNW-A1		PURY-P700YSNW-A1		PURY-P700YSNW-A1		PURY-P800YSNW-A1		PURY-P900YSNW-A1	
CAPACITY (kW)		Heating (nominal)		76.5		81.5		88.0		95.0		100.0	
		Cooling (nominal)		73.0		75.0		80.0		86.0		90.0	
		High Performance Heating (JIS)		72.7		77.4		83.0		90.1		95.2	
		COP Priority Heating (JIS)		80.1		74.2		80.1		86.5		91.6	
		Cooling (JIS)		81.0		85.3		91.6		98.1		104.9	
POWER INPUT (kW)		Heating (nominal)		17.63		20.17		20.95		22.45		23.87	
		Cooling (nominal)		18.08		21.79		22.58		25.03		26.37	
		High Performance Heating (JIS)		23.71		26.83		27.84		31.19		32.68	
		COP Priority Heating (JIS)		17.83		20.17		20.95		23.45		24.97	
		Cooling (JIS)		18.04		22.84		23.10		24.90		26.32	
EUP / EER (nominal)		Heating (nominal)		4.35 / 3.83		4.04 / 3.35		4.24 / 3.54		4.26 / 3.29		4.58 / 3.40	
MAX NO. OF CONNECTABLE INDOOR UNITS				50		50		50		50		50	
MAX CONNECTABLE CAPACITY				50~130% OIL Capacity		50~130% OIL Capacity		50~130% OIL Capacity		50~130% OIL Capacity		50~130% OIL Capacity	
AIRFLOW (m³/min)		High		240 / 240		185 / 240		270 / 270		270 / 240		270 / 240	
PIPE SIZE (mm (in))		Roo		26.68 (1.05)		26.68 (1.05)		34.93 (1.38)		34.93 (1.38)		34.93 (1.38)	
		Liquid		15.88 (0.62)		15.88 (0.62)		19.05 (0.75)		19.05 (0.75)		19.05 (0.75)	
SOUND PRESSURE LEVEL (dBA)		Heating / Cooling		67.5 / 64.0		68.0 / 65.0		67.0 / 65.0		68.5 / 67.0		71.0 / 67.5	
SOUND POWER LEVEL (dBA)		Heating / Cooling		87.0 / 83.0		87.0 / 83.0		86.0 / 83.0		88.0 / 84.0		91.0 / 85.0	
WEIGHT (kg)				226 ± 2.6		213 ± 2.7		271 ± 2.7		277 ± 2.7		277 ± 2.6	
DIMENSIONS (mm)		Width		900 ± 3.0		820 ± 1.0		1240 ± 1.0		1240 ± 1.0		1240 ± 1.0	
		Depth		740		740		740		740		740	
		Height		1850		1850		1850		1850		1850	
(1750mm without legs)													
ELECTRICAL SUPPLY ¹⁾				380-415V 50Hz		380-415V 50Hz		380-415V 50Hz		380-415V 50Hz		380-415V 50Hz	
PHASE ¹⁾				Three		Three		Three		Three		Three	
STARTING CURRENT (A) ¹⁾				8		8		8		8		8	
NOMINAL SYSTEM RUNNING CURRENT (A) ¹⁾		Heating / Cooling (kW)		28.5 / 29.9 (22.7 ± 22.7)		32.1 / 34.9 (17.6 ± 31.9)		28.5 / 30.2 (26.4 ± 28.4)		37.6 / 41.4 (20.4 ± 31.9)		32.8 / 40.1 (26.4 ± 37.1)	
GUARANTEED OPERATING RANGE (°C)		Heating / Cooling		-20~18.5 / 2~32		-20~15.0 / 5~42		-20~18.5 / 2~32		-20~10.0 / 5~42		-20~18.5 / 2~32	
FUSE RATING (MOL size: BC EN 60947-2) - (A) ¹⁾				1 x 25 / 1 x 25		1 x 20 / 1 x 20		1 x 32 / 1 x 32		1 x 32 / 1 x 32		1 x 32 / 1 x 40	
MAINS CABLE No. Cores ¹⁾				4 + earth / 4 + earth		4 + earth / 4 + earth		4 + earth / 4 + earth		4 + earth / 4 + earth		4 + earth / 4 + earth	
CHARGE REFRIGERANT (kg) / CO ₂ EQUIVALENT (t) R410A (GWP 2088)				13 / 27		16.5 / 34.0		19.0 / 40.5		19.6 / 40.9		20.0 / 43.0	
MAX ADDITIONAL REFRIGERANT (R410A) / CO ₂ EQUIVALENT (t) R410A (GWP 2088)				34.7 / 72.5		35.2 / 73.5		44.8 / 93.5		44.8 / 93.5		44.7 / 93.3	

Notes: *SEER/EER/COP available separately in the "City Multi VRF (Seasonal Efficiency)" document. Based on Roadsign Ltd 21/5 to EN14525 standard.
¹⁾ A separate power supply is required for each module. Where more than one figure is quoted these are multiple modules.

PURY-P600YSNW-A1		PURY-P600YSNW-A1		PURY-P700YSNW-A1	
SIDE VIEW	FRONT VIEW	SIDE VIEW	FRONT VIEW	SIDE VIEW	FRONT VIEW



Product Information

next
GENERATION VPS

Unit (kW Cooling)

Units E and F Floor Unit H (Cooling)



Units E and F

Unit 4

		R410A (nominal)		R410A (nominal)		R410A (nominal)		R410A (nominal)		R410A (nominal)		R410A (nominal)	
CAPACITY (kW)	Heating (nominal)	25.0	31.5	37.5	45.0	50.0	59.0						
	Cooling (nominal)	25.4	32.0	38.5	46.0	50.0	59.0						
	High Performance Heating (HP)	25.0	31.5	37.5	45.0	50.0	59.0						
	QSP Priority Heating (kW)	25.0	28.7	34.1	41.0	45.0	53.5						
	Cooling (kW)	20.1	25.1	30.0	35.5	40.3	46.1						
POWER INPUT (kW)	Heating (nominal)	5.10	7.50	8.96	10.98	12.07	14.52						
	Cooling (nominal)	4.91	7.14	8.79	10.90	11.99	14.47						
	High Performance Heating (kW)	5.43	9.07	11.25	13.87	15.88	19.47						
	QSP Priority Heating (kW)	5.10	7.20	8.46	10.36	12.00	14.59						
	Cooling (kW)	2.76	4.14	5.10	6.35	7.02	8.70						
QSP / EER (nominal)	4.90 / 4.96	4.37 / 3.92	4.43 / 3.81	4.53 / 3.65	4.08 / 3.17	4.75 / 4.51							
MAX NO. OF CONNECTABLE INDOOR UNITS		17	21	25	30	34	34						
MAX CONNECTABLE CAPACITY		50 ~ 130% QSP Capacity	50 ~ 130% QSP Capacity	50 ~ 130% QSP Capacity	50 ~ 130% QSP Capacity	50 ~ 130% QSP Capacity	50 ~ 130% QSP Capacity						
AIRFLOW (m³/min)	High	170	180	240	270	300	370 / 170						
PIPE SIZE mm (in)	Gas	Ø22.0 (7/8")	Ø22.0 (7/8")	Ø22.0 (7/8")	Ø28.0 (1.125")	Ø28.0 (1.125")	Ø28.0 (1.125")						
	Liquid	Ø9.52 (3/8")	Ø9.52 (3/8")	Ø9.52 (3/8")	Ø12.7 (1/2")	Ø12.7 (1/2")	Ø12.7 (1/2")						
SOUND PRESSURE LEVEL (dBA)	Heating / Cooling	58.0 / 58.0	61.0 / 60.0	64.0 / 61.0	67.0 / 65.0	67.0 / 61.0	67.0 / 61.0						
SOUND POWER LEVEL (dBA)	Heating / Cooling	77.0 / 75.0	80.0 / 75.0	84.0 / 80.0	85.0 / 80.0	86.0 / 82.0	86.0 / 78.0						
WEIGHT (kg)		213	213	281	277	277	213 ~ 213						
DIMENSIONS (mm)	Width	880	900	880	1240	1240	900 ~ 880						
	Depth	740	740	740	740	740	740						
	Height	1250	1828	1250	1828	1828	1250						
(1) (Unit without legs)													
ELECTRICAL SUPPLY ①		Ø80-415V, 50Hz	Ø80-415V, 50Hz	Ø80-415V, 50Hz	Ø80-415V, 50Hz	Ø80-415V, 50Hz	Ø80-415V, 50Hz						
PHASE ②		Three	Three	Three	Three	Three	Three						
STARTING CURRENT (A) ③		8	8	8	8	8	8						
MINIMUM SYSTEM RUNNING CURRENT (A) ④		Heating / Cooling (max)	8.7 / 7.7 (11.1)	13.6 / 14.6 (22.4)	16.6 / 17.5 (25.4)	18.6 / 22.7 (31.8)	16.6 / 15.5 (16.1)						
GUARANTEED OPERATING RANGE (°C)		Heating / Cooling	20 ~ 15.5 / 5 ~ 50	20 ~ 15.5 / 5 ~ 50	20 ~ 15.5 / 5 ~ 50	20 ~ 15.5 / 5 ~ 50	20 ~ 15.5 / 5 ~ 50						
FUSE RATING (MCCB sizes Ø3 EN 60947-2) - (A) ⑤		1 x 20	1 x 20	1 x 20	1 x 32	1 x 32	1 x 20 / 1 x 20						
MATING CABLE No. Cables ⑥		4 ~ 2mm	4 ~ 2mm	4 ~ 2mm	4 ~ 2mm	4 ~ 2mm	4 ~ 2mm / 4 ~ 2mm						
CHARGE REFRIGERANT (kg) / CO ₂ EQUIVALENT (T) R410A (GWP 2088)		5.5 / 13.6	6.5 / 15.6	6.5 / 15.6	9.8 / 20.5	11.7 / 27.1	11.7 / 27.1						
MAX ADDITIONAL REFRIGERANT (kg) / CO ₂ EQUIVALENT (T) R410A (GWP 2088)		15.9 / 35.3	22.0 / 47.3	22.0 / 48.3	24 / 50.1	24.4 / 51.0	30 / 66.8						

¹ 12 Turn(1/2") if P600 furthest length ≥ 90m, P800 furthest length ≥ 40m, ² A separate power supply is required for each module. Where more than one square is quoted there are multiple modules.

[illegible]