

The Senior Administrative Officer,  
Planning Department,  
South Dublin County Council,  
County Hall,  
Tallaght,  
Dublin 24.

21<sup>st</sup> April 2022

Issued by Email under Covid-19 Arrangements

**Re: Register Ref. SD21A/0363– COMPLIANCE SUBMISSION CONDITION 2**

Plant and associated development for the permitted and under construction Unit D (Reg. Ref. SD19A/0370, Reg. SD20A/0215 and Reg. SD20A/0319; works to include 4 air handling units, 2 climate control condensers, 1 transformer, 1 container pump house, 1 sprinkler tank and all associated works including the reduction in car parking by 3 spaces on a site located between the Casement Aerodrome and the N7 national route.

Dear Sir / Madam,

**SD21A/0363 Condition No. 4: Environmental Health Conditions:**

(1) *Noise due to the normal operation of the proposed development, expressed as Laeq over 15 minutes at the façade of a noise sensitive location, shall not exceed the daytime background level by more than 10 dB(A) and shall not exceed the background level for evening and night time. Clearly audible and impulsive tones at noise sensitive locations*

(2) *Prior to commencement of the development the applicant is required to submit an Acoustic Verification report to the Environmental Health Department of South Dublin County Council. The report must confirm whether the development is capable of complying with Council's standard operational noise criteria, set out below:*

*Noise due to the normal operation of the proposed development, expressed as Laeq over 15 minutes at the façade of a noise sensitive location, shall not exceed the daytime background level by more than 10 dB(A) and shall not exceed the background level during evening and night shall be avoided irrespective of the noise level.*

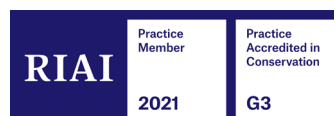
- (a) *This Acoustic Verification report should comprise of noise monitoring data at any noise sensitive locations. It should also include the cumulative noise level whereby the existing noise levels are included in the assessment of the developments overall impact.*
- (b) *The Acoustic Verification report should include performance specifications and any changes/modifications which have been incorporated in order to reduce operational noise levels during the night time period.*

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*The report must include a statement certifying whether the development or proposed use is fully capable of complying with the requirements of the noise control conditions and criteria as set out within the planning consent.*

In response to Condition 4 of SD21A/0363 please find enclosed a copy of the Acoustic Verification Report prepared by AWN Consulting concluding that the predicted plant noise level is at least 20 dB below the established plant noise limit of 48 dB during night-time periods and will not add to the prevailing noise environment. No modifications are required to reduce operational noise levels during the night time period.

The assessment has therefore concluded that the development is capable of complying with the noise control conditions and criteria as set out within the planning consent.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Paul Sinclair', is written over a horizontal line.

**Paul Sinclair**

For and on behalf of JSA Architects

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## TECHNICAL NOTE

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Project **Baldonnell Unit D**

Subject **Acoustic Verification Report**

Author **Jennifer Harmon**

Date **20 April 2022**

Ref. **227501.0211NT01**

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### 1.0 INTRODUCTION

This document has been prepared to address Condition 4.2 of planning Register Reference SD21A/0363 relating to the Grant of Permission for plant and associated development for the permitted and under construction Unit D (Reg. Ref: SD19A/0370, Reg SD20A/0215 and Reg. SD20A/0319); works to include 4 air handling units, 2 climate control condensers, 1 transformer, 1 container pump house, 1 sprinkler tanker and all associated works on a site located between the Casement Aerodrome and the N7 national route.

The Second Schedule Conditions and Reasons for approval includes the following under Condition 4: Environmental Health

- 4.1 *Noise due to the normal operation of the proposed development, expressed as Laeq, over 15 minutes at the façade of a noise sensitive location, shall not exceed the daytime background level by more than 10 dB(A) and shall not exceed the background level for evening and night time. Clearly audible and impulsive tones at noise sensitive locations during evening and night shall be avoided irrespective of the noise level.*
- 4.2 *Prior to commencement of the development the applicant is required to submit an Acoustic Verification report to the Environmental Health Department of South Dublin County Council. The report must confirm whether the development is capable of complying with Council's standard operational noise criteria, set out below: Noise due to the normal operation of the proposed development, expressed as Laeq over 15 minutes at the façade of a noise sensitive location, shall not exceed the daytime background level by more than 10 dB(A) and shall not exceed the background level for evening and night time.*



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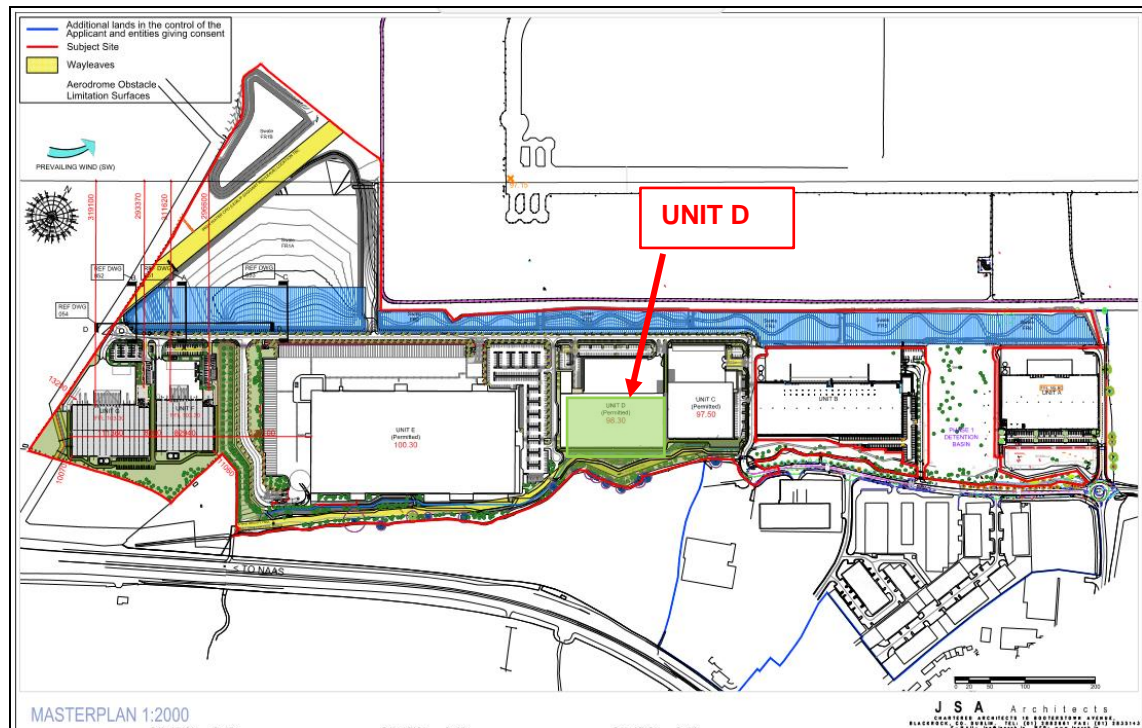
- (a) This Acoustic Verification report should comprise of noise monitoring data at any noise sensitive locations. It should also include the cumulative noise level whereby the existing noise levels are included in the assessment of the developments overall impact.*
- (b) The Acoustic Verification report should include performance specifications and any changes/modifications which have been incorporated in order to reduce operational noise levels during the night time period. The report must include a statement certifying whether the development or proposed use is fully capable of complying with the requirements of the noise control conditions and criteria as set out within the planning consent.*

This technical note has been prepared address the information set out in Condition 4.2 (a) and (b). The noise sources associated with normal operation of the facility includes the fixed operational mechanical and electrical plant used to service the development.

## 2.0 SITE DESCRIPTION AND BASELINE NOISE ENVIRONMENT

### 2.1 Site Location

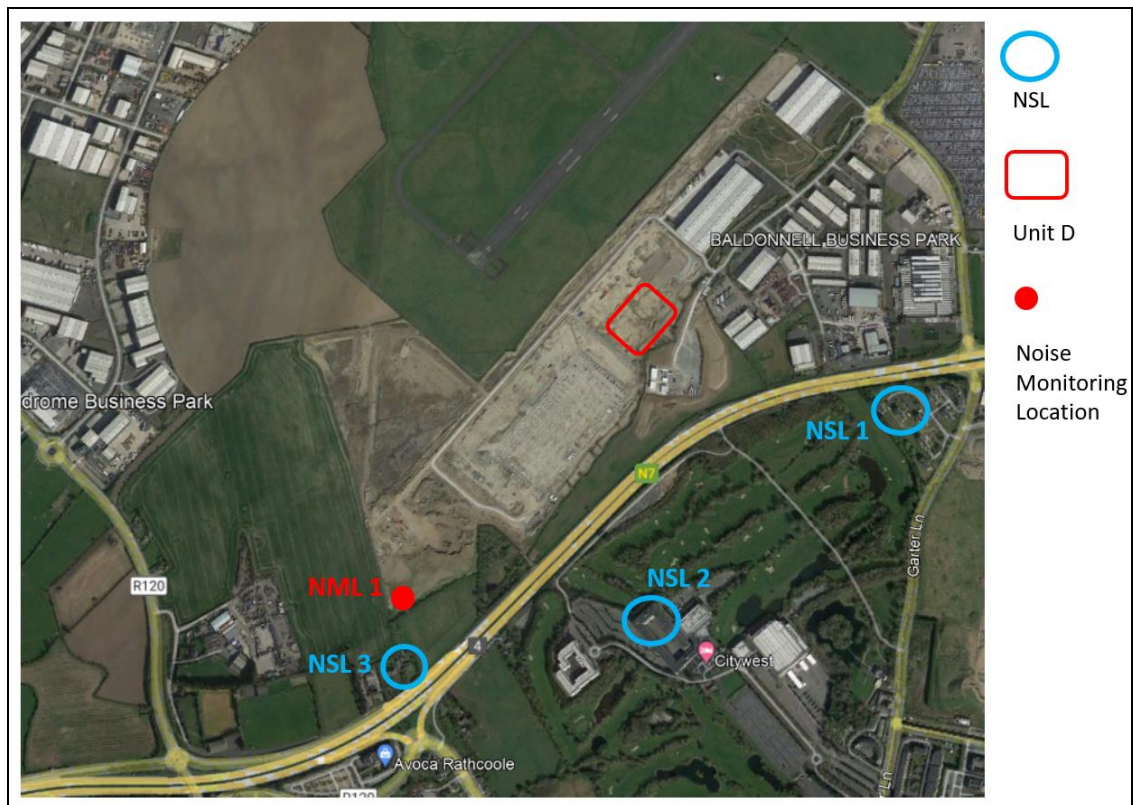
Unit D of the Mountpark development at Baldonnell Business Park is located within the mid portion of the overall Mountpark Masterplan development. Figure 1 highlights the position of the Unit in the context of the surrounding permitted and proposed developments within the Masterplan site.



**Figure 1** Unit D Location within Mountpark Masterplan Site

The location of the closest noise sensitive locations (NSLs) to the facility are located to the south-east of the site across the N7 dual carriageway off Garter Lane at a distance of approximately 500m, south of the site across the N7 dual carriageway at Citywest Hotel at a distance of approximately 550m, and to the south-west of the site at residential properties located immediately north of the N7 dual carriageway at a distance of approximately 800m from the site boundary.

The location of these closest NSL and Unit D is illustrated in Figure 2



**Figure 2** Site Context and closest NSLs

## 2.2 Baseline Noise Environment

In order to characterise the prevailing background noise levels at the nearby NSLs a noise survey was undertaken within the site boundary in closest proximity to the closest NSLs to the south-west. The location of the monitoring position is illustrated in Figure 2.

The monitoring position (NML1) was installed at a distance of 160m from the N7 dual carriageway. The monitoring position is representative of the rear of residential properties NSL 3 to the south-west of the site and also representative of noise levels at the NSL 2 at Citywest Hotel, south of the site which is at a similar distance from the road edge.

### 2.2.1 Survey Periods and Instrumentation

A noise meter was installed at NML1 between 12:35 on Thursday 31 March and 13:55hrs on Monday 4 April 2022.

The monitoring equipment was a Rion NL-42 sound level meter. The microphone was installed at a height of 3.8m above ground level. The monitoring equipment was set to log over 15 minute sample periods.

The measurement apparatus was check calibrated both before and after the survey using a Brüel & Kjær Type 4231 Sound Level Meter Calibrator.

### 2.2.2 Measurement Parameters

The noise survey results are presented in terms of the following parameters:



- L<sub>Aeq</sub>** is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- L<sub>Amax</sub>** is the instantaneous maximum sound level measured during the sample period.
- L<sub>A90</sub>** is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The “A” suffix denotes the fact that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to  $2 \times 10^{-5}$  Pa.

### 2.2.3 Survey Results

During the survey at NML1 construction activities were occurring within the Mountpark site which was predominately noted to be earthmoving equipment and some superstructure works further east. Noise data recorded during daytime periods on Friday, Saturday and Monday have therefore been excluded from the baseline noise results to exclude any influence associated with construction activities on the site.

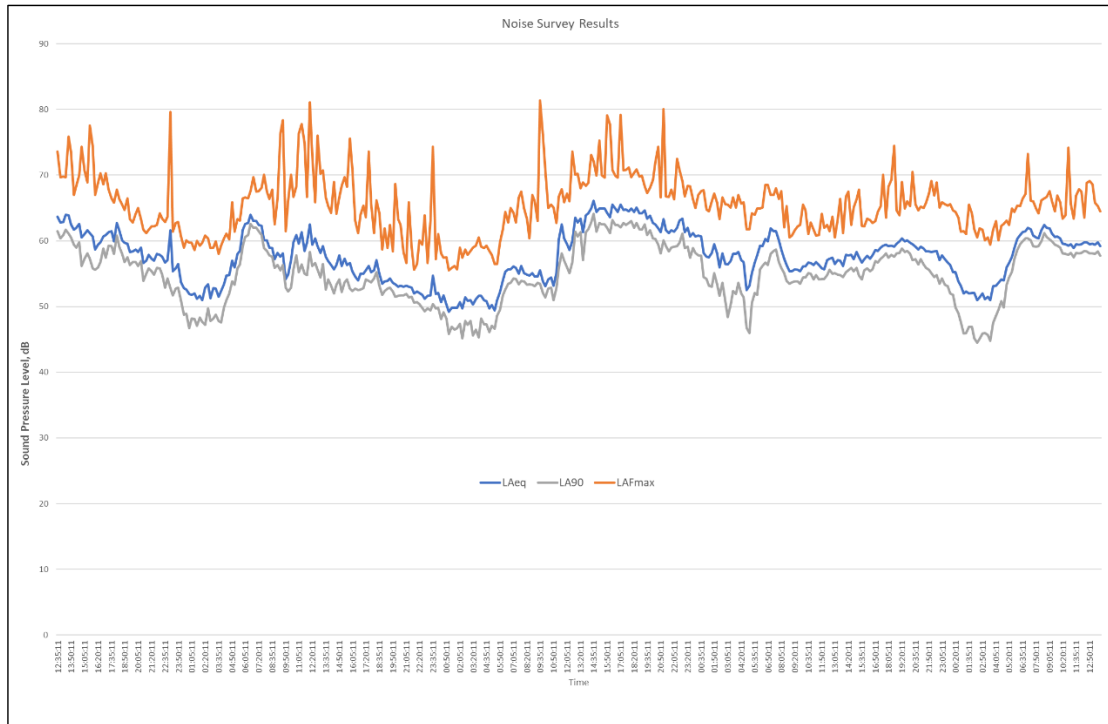
The average Sunday daytime, weekday and weekend evening and night-time survey results is summarised in Table 1. Daytime is defined as the period between 07:00 and 19:00hrs, evening is defined between 19:00 and 23:00hrs and night-time between 23:00 and 07:00hrs.

Period	Date	Average Measured Noise Levels, per period dB		
		L <sub>Aeq</sub>	L <sub>AFmax</sub>	L <sub>AF90</sub>
Daytime	Sunday 3/04/2022	58	61 - 75	56
Evening	Thursday 31/03/2022	58	61 - 67	56
	Friday 01/04/2022	53	56 - 69	51
	Saturday 02/04/2022	63 <sup>Note A</sup>	56 - 69	60 <sup>Note A</sup>
	Sunday 03/04/2022	59	64 - 71	57
Night-time	Thursday 31/03/2022	58	58 - 80	52
	Friday 01/04/2022	52	56 - 74	48
	Saturday 02/04/2022	59 <sup>Note A</sup>	69	54 <sup>Note A</sup>
	Sunday 03/04/2022	56	59 - 67	51

**Table 1** Summary of noise measurements at NML 1

**Note A:** Heavy rainfall and elevated wind speeds occurred during this period. Data from this period is excluded from average values for evening and night-time periods

Full survey data is included in graphed in Figure 3 overleaf.



**Figure 3** Graphed Survey Data for Full Monitoring Period

**2.2.4 Background Noise Level for Assessment**

In line with Condition 4.2 of the Grant of Permission, the following background ( $L_{A90}$ ) values have been used to assess operational plant noise levels against. This is taken as the lowest average value per period over the 4 day period as summarised in Table 1 above.

Daytime: 56 dB  $L_{A90}$   
 Evening: 51 dB  $L_{A90}$   
 Night: 48 dB  $L_{A90}$



### 3.0 PLANT NOISE IMPACT ASSESSMENT

#### 3.1 Operational Noise Limits

The required design goal for plant noise emissions from the development have been determined in the planning conditions as follows:

*Noise due to the normal operation of the proposed development, expressed as  $L_{Aeq}$  over 15 minutes at the façade of a noise sensitive location, shall not exceed the daytime background level by more than 10 dB(A) and shall not exceed the background level for evening and night time.*

Reference to the measured background noise levels discussed in Section 2.2.4, the following operational plant noise limits apply at the nearest NSLs:

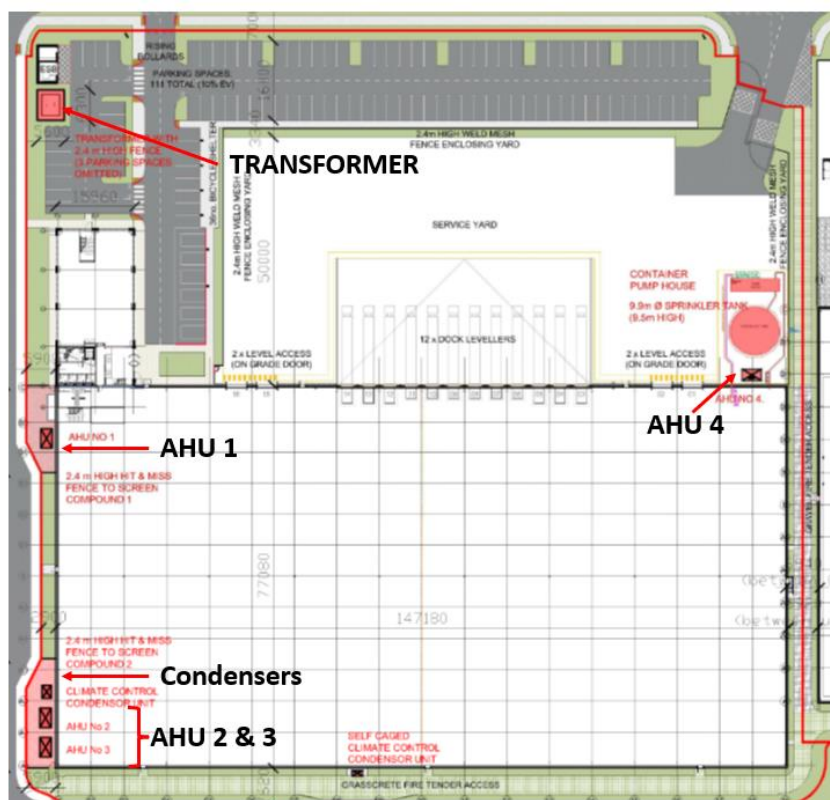
- Daytime (07:00hrs to 19:00hrs) –  $\leq 65$  dB  $L_{Ar,15mins}$
- Evening (19:00hrs to 23:00hrs) –  $\leq 51$  dB  $L_{Ar,15mins}$
- Night-Time (23:00hrs to 07:00hrs) –  $\leq 48$  dB  $L_{Ar,15mins}$

#### 3.2 Calculated Plant Noise Levels

A review of mechanical plant serving the development has identified the following major noise emission points:

- 4 No. air handling units;
- 2 No. climate control condensers, and;
- 1 No. transformer

All items of plant are located at ground level around the building perimeter. Figure 3 illustrates the location of each.



**Figure 4** Location of External Plant Items Serving Unit D

Noise prediction calculations have been undertaken for the plant items listed above. Noise emission data has been taken from manufacturer's data supplied by the design team. These are provided in Appendix A.

Plant Item	Location	Model Ref	Operational Noise Output – dB Sound Power ( $L_{WA}$ )
AHU 1 – 4	AHU Compounds as per Figure 4	Airfinity IH 140	85
Ground Floor VRF Condenser unit OU/01	Ground Floor condenser compound as per Figure 4	Mitsubishi PURY-P300YNW	86
First Floor VRF Condenser unit OU/02		Mitsubishi PURY-P250YNW	80
Transformer	Transformer compound as per Figure 4	n/a	80 <sup>Note A</sup>

**Table 2** Sound data for Dominant Operational External Plant

**Note A** Sound emission data not available for this item of plant. A Sound Power value of 80 dB (A) has been used. This is worst case based on previous data sets reviewed for other plant noise assessments.

For each individual noise source, the calculation of noise propagation has taken into account attenuation with distance, source directivity and screening. The plant compounds are screened by slatted hit and miss fencing. No acoustic attenuation has been assumed for the compound perimeters. Location NSL2 is south of Unit D and the operational units will be partially screened by adjacent buildings and site orientation, hence a partial screening correction of 5 dB has been applied for this location. Plant items are substantially screened from NSLs 1 and 3 from the Unit D building in addition to adjacent units within the Mountpark site and hence a screening correction of -10 dB has been applied for both these locations.

The predicted specific plant noise level the three NSLs identified in Figure 2 is presented in Table 3, a calculation sheet is provided in Appendix B for NSL1 for example.

Location Reference	Description	Predicted Specific Noise Level $L_{Aeq,T}$ (dB(A) re. $2 \times 10^{-5}$ Pa)
NSL 1	Residential dwellings to south-east	20
NSL 2	Citywest Hotel, South	25
NSL 3	Residential dwellings to south-west	16

**Table 3** Predicted Plant Noise Level at Nearest NSLs to Unit D

#### 4.0 ASSESSMENT AGAINST PLANNING CONDITION 4

For the purposes of the acoustic verification assessment, the following have been established relating to NSL 2 where highest plant noise emissions are calculated;

- The highest *Specific Noise Level* of the noise sources under consideration is calculated as 25dB  $L_{Aeq,T}$  as per Section 3.2;
- The *Rating Noise Level*, which is derived by applying adjustments to the specific noise level for characteristic features of the sound. The plant noise under consideration is generally broadband in nature and should not exhibit any impulsivity. Given the low calculated noise level and prevailing noise environment, the plant noise emissions will be largely inaudible at the nearest NSL, hence no adjustments are therefore required. The value of the rating noise level is therefore taken to be equal to the specific noise level, i.e. 25 dB  $L_{Ar,Tr}$ ; and
- The *Background Noise Level* over the periods of interest, as per Section 2.2.4

Table 4 provides a summary of the impact assessment.

Assessment Criteria	Period		
	Daytime	Evening	Night-time
Background Noise Level, dB $L_{A90}$	56	51	48
Allowable increase in background, dB	+10	0	0
Plant Noise Limit, dB	66	51	48
Highest Calculated plant noise level, dB $L_{Aeq}$	25	25	25
Plant Noise Level combined with background Noise Level	56	51	48
Increase above background noise level, dB	0	0	0
Complies ?	Yes	Yes	Yes

**Table 4** Comparison against Planning Condition 4

The predicted plant noise level is at least 20 dB below the established plant noise limit of 48 dB during night-time periods and will not add to the prevailing noise environment. No modifications are required to reduce operational noise levels during the night time period.

The assessment has therefore concluded that the development is capable of complying with the noise control conditions and criteria as set out within the planning consent.

**APPENDIX A**  
**PLANT DATA SHEETS**

## AHU DATA SHEET



## Airfinity™ XL

Models IC XL (Cooling only)		IC140	IC150	IC170	IC190	IC 220 (5)	IC250 (5)	IC270 (5)
Nominal airflow	(m <sup>3</sup> /h)	24000	26000	28000	33000	36000	42000	44000
Net cooling capacity (1)	(kW)	140.0	153.9	170.5	194.1	211.6	233.3	247.2
Total power input	(kW)	41.0	47.4	53.9	65.4	76.2	82.6	89.4
Net EER		3.41	3.25	3.16	2.97	2.78	2.82	2.77
Seasonal energy efficiency (η <sub>s.c</sub> ) (2)	(%)	196.4	188.0	179.8	165.7	149.1	147.3	142.1
SEER (2)		4.99	4.78	4.57	4.22	3.80	3.76	3.63
Outdoor sound power level (3)	(dB(A))	85	85	86	91	91	92	92
Length	(mm)	5618	5618	5618	5618	5618	6518	6518
Width	(mm)	2250	2250	2250	2250	2250	2250	2250
Height	(mm)	2275	2275	2275	2275	2275	2275	2275
Operating weight (4)	(kg)	2393	2401	2519	2630	2703	2918	2922

Models IH XL (Heat pump)		IH140	IH150	IH170	IH190	IH220	IH250 (5)	IH270 (5)
Nominal airflow	(m <sup>3</sup> /h)	24000	26000	28000	33000	36000	42000	44000
Net cooling capacity (1)	(kW)	137.6	150.6	161.5	184.9	200.0	222.9	239.3
Total power input	(kW)	42.2	48.7	55.5	67.1	79.2	89.0	96.7
Net EER		3.26	3.09	2.91	2.76	2.52	2.50	2.47
Seasonal energy efficiency (η <sub>s.c</sub> ) (2)	(%)	187.9	182.6	170.3	160.5	145.4	142.3	138.1
SEER (2)		4.77	4.64	4.33	4.09	3.71	3.63	3.53
Net heating capacity (1)	(kW)	135.9	152.0	166.8	194.7	217.8	248.7	267.5
Total power input	(kW)	38.1	43.1	47.5	59.0	68.4	85.6	94.0
Net COP		3.57	3.52	3.51	3.30	3.18	2.91	2.84
Seasonal energy efficiency (η <sub>s.h</sub> ) (2)	(%)	135.1	137.0	140.1	133.8	126.6	127.2	125.1
SCOP (2)		3.45	3.50	3.58	3.42	3.24	3.26	3.20
Outdoor sound power level (3)	(dB(A))	85	85	86	91	91	92	92
Length	(mm)	5618	5618	5618	5618	5618	6518	6518
Width	(mm)	2250	2250	2250	2250	2250	2250	2250
Height	(mm)	2275	2275	2275	2275	2275	2275	2275
Operating weight (4)	(kg)	2335	2503	2561	2672	2744	2939	2942

# CONDENSER DATA SHEET

Air Conditioning

## Product Information

### R2 Series Standard (22.4-45kW)

Simultaneous Heating and Cooling with Heat Recovery Outdoor Unit

Making a World of Difference



OUTDOOR UNITS		PURY-P200Y-NW-A	PURY-P250YNW-A	PURY-P300YNW-A	PURY-P350YNW-A	PURY-P400YNW-A	PURY-P400YSNW-A
CAPACITY (kW)	Heating (nominal)	25.0	31.5	37.5	45.0	50.0	50.0
	Cooling (nominal)	22.4	28.0	33.5	40.0	45.0	45.0
	High Performance Heating (UK)	25.0	31.5	35.6	42.8	45.0	50.0
	COP Priority Heating (UK)	22.8	28.7	34.1	41.0	43.0	45.5
	Cooling (UK)	20.0	25.1	30.0	35.8	40.3	40.3
POWER INPUT (kW)	Heating (nominal)	4.71	6.06	8.38	10.68	13.65	9.72
	Cooling (nominal)	4.43	5.97	7.54	10.04	11.59	9.17
	High Performance Heating (UK)	5.93	7.64	11.15	14.20	15.42	12.44
	COP Priority Heating (UK)	4.71	6.06	8.38	10.68	13.24	9.72
	Cooling (UK)	2.57	3.46	4.37	5.82	7.42	5.32
COP / EER (nominal)	5.30 / 5.65	5.19 / 4.69	4.47 / 4.44	4.21 / 3.98	3.86 / 3.88	5.14 / 4.90	
SCOP / SEER	-	-	-	-	-	-	
MAX No. OF CONNECTABLE INDOOR UNITS	20	25	30	35	40	40	
MAX CONNECTABLE CAPACITY	50-150% OU Capacity	50-150% OU Capacity	50-150% OU Capacity	50-150% OU Capacity	50-150% OU Capacity	50-150% OU Capacity	
AIRFLOW (m³/min)	High	170	185	240	250	315	170 / 170
PIPE SIZE mm (in)	Gas	19.05 (3/4")	22.2 (7/8")	22.2 (7/8")	25.5 (1-1/8")	28.58 (1-1/8")	28.58 (1-1/8")
	Liquid	15.88 (5/8")	19.05 (3/4")	19.05 (3/4")	9.05 (3/4")	22.2 (7/8")	22.2 (7/8")
SOUND PRESSURE LEVEL (dBA)		55.0	61.0	67.0	64.0	69.0	62.0
SOUND POWER LEVEL (dBA)		78.0	80.0	86.5	83.0	88.0	81.0
WEIGHT (kg)		229	229	231	273	273	229 + 229
DIMENSIONS (mm)	Width	920	920	920	1240	1240	920 + 920
	Depth	740	740	740	740	740	740
	Height	1858	1858	1858	1858	1858	1858
(1798mm without legs)							
ELECTRICAL SUPPLY <sup>1</sup>		380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz
PHASE <sup>1</sup>		Three	Three	Three	Three	Three	Three
STARTING CURRENT (A) <sup>1</sup>		8	8	8	8	8	8
NOMINAL SYSTEM RUNNING CURRENT (A) <sup>1</sup> Heating/Cooling [MAX]		7.2 / 6.8 [1.3]	9.3 / 9.2 [17.8]	12.9 / 11.6 [22.7]	16.3 / 15.5 [27.6]	21.0 / 17.9 [35.1]	15.0 / 14.1 [16.1 + 16.1]
GUARANTEED OPERATING RANGE (°C) Heating / Cooling		-20/-15.5 / +5/-52	-20/-15.5 / +5/-52	-20/-15.5 / +5/-52	-20/-15.5 / +5/-52	-20/-15.5 / +5/-52	-20/-15.5 / +5/-52
FUSE RATING (MCB sizes BS EN 60947-2) - (A) <sup>1</sup>		1 x 20	1 x 20	1 x 25	1 x 32	1 x 40	1 x 20 / 1 x 20
MAINS CABLE No. Cores <sup>1</sup>		4 + earth	4 + earth	4 + earth	4 + earth	4 + earth	4 + earth / 4 + earth
CHARGE REFRIGERANT (kg) / CO <sub>2</sub> EQUIVALENT (t) R410A (GWP 2088)		5.2 / 10.9	5.2 / 10.9	5.2 / 10.9	8 / 16.7	8 / 16.7	10.4 / 21.7
MAX ADDITIONAL REFRIGERANT (kg) / CO <sub>2</sub> EQUIVALENT (t) R410A (GWP 2088)		31.8 / 66.5	37.8 / 78.9	37.8 / 78.9	41.3 / 86.2	47.3 / 98.8	60.6 / 126.5

Notes: <sup>1</sup> SCOP / SEER available separately in the 'City Multi VRF Seasonal Efficiency' document, based on Ecodesign Lot 21 / 6 to EN14825 standard, <sup>1</sup> A separate power supply is required for each module, Where more than one figure is quoted they are multiple modules.

## PRODUCT DIMENSIONS

**APPENDIX B**  
**PLANT NOISE CALCULATION SHEET – NSL1**



I. VRF OU/01		
Details		Overall dB(A)
VRF OU01 Sound Power	$L_w$	86.5
Total VRF sound power	$L_{w,total}$	87
Distance	500 m	
-20 log(r) - 11		-65
Surface Directivity	1 dB	
Screening	-10	-10
$L_{p,receiver}$		13
Notes		
a. Calculation: $L_p = L_w - 20 \log(r) - 11 + \text{Surface Directivity} - \text{Screening}$ .		
b. No corrections for source directivity, only surface directivity (i.e. "worst case" scenario).		
II. AHUs (01 - 04)		
Details		Overall dB(A)
AHU Sound Power	$L_w$	85
Number of AHU's	4	
Total VRF sound power	$L_{w,total}$	91
Distance	500 m	
-20 log(r) - 11		-65
Surface Directivity	3 dB	3
Screening	-10	-10
$L_{p,receiver}$		19
Notes		
a. Calculation: $L_p = L_w - 20 \log(r) - 11 + \text{Surface Directivity} - \text{Screening}$ .		
b. No corrections for source directivity, only surface directivity (i.e. "worst case" scenario).		
III. Transformer		
Details		Overall dB(A)
Transformer	$L_{w,total}$	80
Distance	550 m	
-20 log(r) - 11		-66
Surface Directivity	3 dB	
Louvre Transmission Loss		
Path Difference (-1 means no scree	-1 m	
Screening	-5	-5
$L_{p,receiver}$		10
Notes		
a. Calculation: $L_p = L_w - 20 \log(r) - 11 + \text{Surface Directivity} - \text{Screening}$ .		
b. No corrections for source directivity, only surface directivity (i.e. "worst case" scenario).		
III. VRF OU/02		
Details		Overall dB(A)
VRF OU02 Sound Power	$L_w$	80
Distance	500 m	
-20 log(r) - 11		-65
Surface Directivity	3 dB	
Louvre Transmission Loss		
Path Difference (-1 means no scree	-1 m	
Screening	-10	-10
$L_{p,receiver}$		6
Notes		
a. Calculation: $L_p = L_w - 20 \log(r) - 11 + \text{Surface Directivity} - \text{Screening}$ .		
b. No corrections for source directivity, only surface directivity (i.e. "worst case" scenario).		
III. Cumulative plant noise level at closest NSL (NSL1)		
Details		Overall dB(A)
VRF		13
AHU		19
Transformer		10
Cumulative sound pressure level		20