

Subject Report for planning: Atmospheric plant noise emissions – Revision B

Date 13 December 2018

Job No/Ref 230602-70/H05B

1 Introduction

Arup have assessed atmospheric plant noise emissions from fixed plant associated with the base-build of The Post Building in accordance with the planning conditions. It does not assess noise from the operation of plant owned and operated by tenants, albeit that tenants will be required to comply with the conditions attached to the planning permission.

2 Criteria

2.1 Planning conditions

The requirements for atmospheric plant noise emissions are dictated by Planning Condition 20 and Planning Condition 21, as follows.

- 20 *“Technical specification details of the mechanical plant to be installed within the roof top plant area as shown on approved floor plans, together with an accompanying acoustic report, shall be submitted to and approved by the LPA prior to installation of plant. The plant shall not be operated other than in complete accordance with such measures as may be approved.”*
- 21 *“Noise levels from fixed plant associated with the development at a point 1 metre external to sensitive façades shall be at least 5dB(A) less than the existing background measurement (LA90), expressed in dB(A) when all plant/equipment (or any part of it) is in operation unless the plant/equipment hereby permitted will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps), then the noise levels from that piece of plant/equipment at any sensitive façade shall be at least 10dB(A) below the LA90, expressed in dB(A).”*

This report is prepared to satisfy the requirements of Condition 20 in accordance with the noise emission limits specified within Condition 21.

2.2 Limiting plant noise levels

The following building services noise emissions were proposed in our Planning: Acoustics report dated 14 May 2014 on the basis of detailed noise surveys undertaken around the site.

Sensitive façade location	Building services noise emission limit at 1m external to sensitive façade, dBL _{Ar, Tr}			
	Type	0700-1900	1900-2300	2300-0700
Museum Street	Noise from plant	45	47	43
	Noise from plant that has a distinguishable continuous note or distinct impulses	40	42	38
	Noise from plant	47	48	49

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Sensitive façade location	Building services noise emission limit at 1m external to sensitive façade, $dB_{L_{Ar, Tr}}$			
	Type	0700-1900	1900-2300	2300-0700
High Holborn	Noise from plant that has a distinguishable continuous note or distinct impulses	42	43	44
New Oxford Street	Noise from plant	49	50	45
	Noise that from plant has a distinguishable continuous note or distinct impulses	44	45	40
Courtyard	Noise from plant	48	46	44
	Noise from plant that has a distinguishable continuous note or distinct impulses	43	41	39

Table 1: Limits of noise from plant at sensitive receivers

3 Assessment

3.1 Method

This assessment is based on equipment technical submittals Arup has received from the installer, Crown House Technologies, for all base-build fixed plant associated with the building during normally-operating hours (0700 – 2300). Some plant, such as residential MVHR is expected to run at lower duty during night-time hours.

The data from equipment technical submittals has been entered into a SoundPlan model to derive sound levels at 1m from sensitive facades surrounding the development.

3.2 Data

See Appendix A for a schedule of noise emitting sources that have been modelled.

3.3 Results

Levels are given for the position along each sensitive façade location with the highest (i.e. worst-case) sound level. The assessment assumes that the installer has ensured that all plant noise is free from distinguishable continuous notes or distinct impulses.

Sensitive façade location	Level	Worst-case level from all normally-running plant (dB_{LA})	Assessment
Museum Street	1.5m above ground (GF)	30	Meets daytime and evening limits. Does not meet night time limits when plant is not expected to run or to run at a lower duty.
	25m above ground (Approx. 4F)	34	
	49m above ground (Approx. 9F)	45	
	1.5m above ground (GF)	35	

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Sensitive façade location	Level	Worst-case level from all normally-running plant (dBL _A)	Assessment
High Holborn	25m above ground (Approx. 4F)	34	Meets daytime, evening and night time limits.
	49m above ground (Approx. 9F)	41	
New Oxford Street	1.5m above ground (GF)	27	Meets daytime, evening and night time limits.
	25m above ground (Approx. 4F)	31	
	49m above ground (Approx. 9F)	43	
Courtyard	1.5m above ground (GF)	40	Meets daytime and evening limits. Does not meet night time limits when plant is not expected to run or to run at a lower duty.
	25m above ground (Approx. 4F)	35	
	49m above ground (Approx. 9F)	46	

4 Conclusion

This assessment summarised in this report demonstrates that the requirements of Condition 20 and Condition 21 are satisfied.

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Appendix A: Plant noise data

Location		Description	Modelled as	Octave band sound power level, dB re 10-12W							
				63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Ground floor	South façade	Plant in loading bay, egress via vehicle entrance. Size 7m × 4.2m	Plane source on building envelope	72	69	61	52	42	44	45	43
	South façade	Louvre associated with exhaust fan from SSE Transformer Room. Louvre size 300mm × 300mm	Plane source on building envelope	80	70	61	55	38	37	38	38
	East façade	Louvre associated with Bin Room exhaust fan BEF/OFF/10/001. Louvre size 1.3m × 2.8m	Plane source on building envelope	80	72	59	34	28	21	21	29
	East façade	Plant in loading bay, egress via acoustic louvres. Size 13.5m × 2.7m	Plane source on building envelope	73	70	62	53	43	45	46	44
Multiple floors	South façade	Exhaust louvre from MVHR in residential properties. Three per floor over eight floors. Each louvre 220mm × 90mm	24 point sources on building envelope	58	56	50	48	29	16	9	13
Fourth floor	East façade	Louvre associated with AHU1 and AHU2 intake via plenum. Louvre size 6m × 2.5m	Plane source on building envelope	65	31	12	24	23	25	25	27

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Location		Description	Modelled as	Octave band sound power level, dB re 10-12W							
				63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
	East facade	Louvre associated with AHU3 and AHU4 intake via plenum. Louvre size 5m × 2.5m	Plane source on building envelope	45	50	43	31	26	28	30	30
Fifth floor	South facade	Intake louvre to MVHRs in residential properties. Louvre size 800mm × 600mm	Plane source on building envelope	75	54	31	-2	-31	-36	-42	-6
Rooftop, fully enclosed behind plant screen		Louvre associated with Toilet extract fan TEF/OFF/10/003A and TEF/OFF/10/003B	Point source on rooftop	85	77	69	59	46	38	37	46
		Louvre associated with Toilet extract fan TEF/OFF/10/002 and TEF/OFF/10/006	Point source on rooftop	77	71	64	54	30	37	41	41
		Ducted intake to AHU/OFF/10/08	Point source on rooftop	62	50	40	30	5	1	-3	10
		Ducted exhaust to AHU/OFF/10/08	Point source on rooftop	68	63	49	40	11	11	13	28
		Case-radiated noise from AHU/OFF/10/08	Point source on rooftop	59	58	45	48	35	34	34	26
		Louvre associated with Toilet extract fan TEF/OFF/10/001	Point source on rooftop	72	65	56	42	20	26	28	31

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Location	Description	Modelled as	Octave band sound power level, dB re 10-12W							
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
	Louvre associated with Toilet extract fan TEF/OFF/10/017	Point source on rooftop	72	65	56	42	20	26	28	31
	Three hybrid dry coolers	Plane sources above rooftop	72	72	69	67	64	59	52	43