Our Ref: 3556/cmb

26 November 2009



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Nishant Gupta Ardmore Construction Limited 2 – 20 Winchester Road London NW3 3NT

Dear Nishant

WINCHESTER ROAD PLANT NOISE ANALYSIS

Following ongoing detailed plant noise analysis in conjunction with CPC and the various subcontractors, we are pleased to present our final report regarding plant noise attenuation measures.

This report deals with both noise transmission to the environment and airborne noise transmission through the structures.

This report can be used to discharge any associated planning conditions regarding plant noise.

1.0 Plant and Associated Operating Hours

Noise generating plant is to be located within a number of areas within the development. There are two plantrooms at Basement Level 1 and two plantrooms at Basement Level 2. There will also be ventilation fans within the car park areas.

The location of plant areas within the development is shown on the attached Figures 3556/PL1 and 3556/PL2.

The individual items of noise generating plant, their location and associated noise levels are detailed on the attached Plant Noise Schedule 3556/PNS1. Noise levels have generally been obtained directly from the sub-contractors and/ or manufacturers.

We understand the plant will potentially operate throughout both the daytime and night-time periods, although plant associated with the car park will only operate during the daytime period.

2.0 Environmental Noise Survey and Plant Noise Emission Criteria

Atmospheric Criteria

An environmental noise survey has previously been undertaken at the site by Hoare Lea Acoustics. Details of the measurements undertaken can be found in their Stage D Acoustics Report dated 24 July 2006.

The London Borough of Camden's criteria for plant noise are as follows:

"Noise levels at a point 1 metre external to sensitive facades shall be at least 5dB(A) less than the existing background measurement (LA90), expressed in dB(A) when all plant/ equipment are in operation.

Where it is anticipated that any plant/ equipment will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/ or if there are distict impulses (bangs, clicks, clatters, thumps) special attention should be given to reducing the noise levels from that piece of plant/ equipment at any sensitive façade to at least 10dB(A) below the LA90, expressed in dB(A)."

Based on the results of the Hoare Lee survey, the typical minimum L_{A90} noise levels measured at the site are detailed below:

Daytime L_{A90} (07:00 – 23:00 hours) – 52dBA Night-time L_{A90} (23:00 – 07:00 hours) – 41dBA

The criteria to be achieved at the nearest noise sensitive façade (assuming no tonal or impulsive noise) are therefore as follows:

Daytime (07:00 - 23:00 hours) - Maximum L_{Aeq} allowed - 47dBA Night-time (23:00 - 07:00 hours) - Maximum L_{Aeq} allowed - 36dBA

Noise Transmission through Structures Criteria

The following criterion has been targeted in our assessment – this is based on designing noise break-in to 5-10dB below typical NR criteria for residential spaces.

Residential Habitable Rooms - NR15-20

3.0 Atmospheric Noise Assessment

General

Calculations have been undertaken of the noise transfer from noise sources to different receptors. The following situations have been considered:

Noise Source	Assessment Location	Comments	Criteria
Dry Cooler Vent	Block C Ground Level Window	Distance losses of 1 – 3m, directivity effects	36dBA
Car Park Inlet Grille	Block C Ground Level Window	Distance loss of 3m, directivity effects	47dBA
Car Park Exhaust Vent	Block B First Floor Window	Distance loss of 3m	47dBA
Plant room supply fan	Block C Ground Floor Window	Distance loss of 11m	36dBA
Plant room extract (natural)	Block A Ground Floor window	Distance loss of 11m, directivity effects	36dBA

The attached Figure 3556/SP1 illustrates the location of the above noise sources and noise sensitive receptors.

Measures

In order to achieve the Local Authority criteria at the noise sensitive receptors detailed above, silencers will be introduced within the ductwork of the plantroom ventilation ducts and to the rear of the car park and dry air cooler ventilation openings.

In order to achieve the Local Authority criteria, the silencers will achieve the insertion losses as detailed on the attached Attenuator Schedule 3556/SS1.

4.0 Plant Room Structures

An acoustic assessment has been undertaken of airborne noise transmission through the structures from the various plant rooms to adjacent residential flats.

In order to achieve the proposed criterion of NR15 – 20 within adjacent residential rooms, acoustic measures will be introduced where necessary as detailed below:

Plantroom 3 at Basement Level 2 to Residential at Basement Level 1 (Separating Floor)

We understand the separating floor construction comprises:

- 70mm floating screed
- 120mm insulation
- 250mm concrete slab

Due to the relatively high noise levels from the booster pumps, an acoustic ceiling will be introduced within the plantroom. This ceiling will comprise:

- MF type support system creating void of approximately 100mm, with 50mm insulation (10 – 36kg/m³) within the void
- 2 x layers of 12.5mm dense plasterboard

Plantroom 2 at Basement Level 2 to Residential at Basement Level 1 (Separating Floor)

We understand the separating floor below Block A is as above, with the separating floor below Block D comprising:

- 70mm floating screed
- 100mm insulation
- 140mm polystyrene
- 250mm concrete slab

Our calculations indicate the constructions are satisfactory and no further treatment is required.

Dry Air Cooler Plant Room to Residential at Ground Level (Separating Floor)

We understand the separating floor construction comprises:

- Floating screed
- Isolating layer
- 300mm concrete slab
- Thermal insulation (plant room side).

Our calculations indicate this construction is satisfactory and no further treatment is required.

Basement Level 1 Car Park to Adjacent Flats (Separating Wall)

We understand the separating wall construction comprises:

- 100mm concrete aggregate blockwork
- 100mm void with insulation
- 100mm concrete aggregate blockwork
- Plasterboard-on-dabs (residential side)

Our calculations indicate this construction is generally satisfactory and no further treatment is required.

From a general Part E viewpoint, the blockwork is to be sealed with a scratch-finished render prior to implementation of the plasterboard-on-dabs.

Plantroom 1 at Basement Level 1 to Adjacent Flat A02 (Separating Wall)

We understand the separating wall construction comprises:

- 100mm concrete aggregate blockwork
- GypLyner type system creating void of approximately 40mm, with 30mm mineral wool (33kg/m³) within void
- 1 x layer of 12.5mm dense plasterboard (residential side)

In order to achieve the criterion, an additional leaf of 100mm concrete aggregate blockwork will be introduced on the plantroom side of the wall. A clear cavity of 50mm will exist between the blockwork leaves.

5.0 Conclusions

A noise impact assessment of the proposed noise generating plant at the Winchester Road development has been undertaken.

We are pleased to conclude the following:

- The Local Authority atmospheric noise criteria will be achieved at the nearest sensitive windows within the development with the proposed silencers
- The proposed plant room structures and additional measures will present adequate resistance to the passage of airborne sound through the structures to adjacent habitable rooms.

Yours sincerely, For RBA Acoustics

C. Rladen

Charles Bladon









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Winchester Road

Plant Noise Schedule

3556/PNS1

Ref:	Plant Description	Location	Duty		Data: mfr/empir.	Sound Level (dB) @ Octave Band Centre Frequency (Hz)								
		Location	m³/s	Pa	Lw/Lp	63	125	250	500	1k	2k	4k	8k	
	Dry Air Coolers (4 fans, Y connection)	Dry Air Cooler Plant Room, Basement L1			Lw	-	64	63	63	62	56	48	41	
	Car Park IDV Induction Fans (4 off)	Car Park, Basement L1 & Basement L2			Lw	53	48	52	49	46	40	35	26	
	Car Park Vertical Discharge, Inlet with 1 DNP silencer (2 off)	Car Park, Basement L1	3.78	300	L _w (normal operation)	75	69	69	62	63	68	65	63	
	Car Park Vertical Discharge, Outlet with no silencer (2 off)	Car Park, Basement L1	3.78	300	L _w (normal operation)	79	75	76	76	77	78	73	68	
	Plant room ventilation fan	Plantroom 1, Basement L1			L _w inlet L _w outlet	69 83	71 84	74 78	63 70	62 66	58 61	52 54	46 47	
	Boilers (3 off)	Plantroom 2, Basement L2			Lρ	60dBA @ 1m								
	Heat pumps (2 off)	Plantroom 1, Basement L1			L _ρ	68dBA @ 1m								
	Booster set	Plantroom 3, Basement L2			Lρ	76dBA @ 1m 61dBA @ 1m								
	Primary LTHW	Plantroom 2, Basement L2	1.5kW		Lp									
	Secondary LTHW Block A	Plantroom 2, Basement L2	1.5kW		Lp	48dBA @ 1m								

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Winchester Road

Plant Noise Schedule

3556/PNS1

Ref:	Plant Description	Location	Duty	Data: mfr/empir.	Sou	nd Leve	l (dB) @	Octave	Band Ce	entre Fre	quency	(Hz)			
			m ⁷ /s Pa	Lw/Lp	63	125	250	500	1k	2k	4k	8k			
	Secondary LTHW Block B	Plantroom 2, Basement L2	2.2kW	Lρ	61dBA @ 1m										
	Secondary LTHW Block C & D	Plantroom 2, Basement L2	1.5kW L _p 48dBA @ 1m							m					
	GSHP to Plate Heat Exchanger	Plantroom 2, Basement L2	2.2kW	L _p 61dBA @ 1m											
	Secondary CHW Block B	Plantroom 1, Basement L1	3.0kW	Ļρ	61dBA @ 1m										
	GSHP to CHW Buffer	Plantroom 1, Basement L1	1.1kW	Ļρ	61dBA @ 1m										
	Heat pump circulation (2 off)	Plantroom 1, Basement L1	7.5kW	L _ρ	68dBA @ 1m										
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Winchester Road

Attenuator Schedule

Ref 3556/SS1

Silencer	Description	No. Off	Dimensions (mm)			Vol	Max PD	Minimum Insertion Loss (dB) at Octave Band Centre Frequency (Hz)								
nei.			W	н	L	m/s	Pa	63	125	250	500	1k	2k	4k	8k	
	Car Park Vertical Discharge Fans (atmospheric side)	1	4000*	1000*	1200		*	5	11	19	29	36	37	29	18	
	Car Park Air Inlet Vent	1	4000	1000	600			1	2	7	10	11	9	8	7	
	Dry Air Cooler Vent Openings	2	4000	2000	900			4	7	13	19	23	23	16	13	
	Plantroom Natural Extract	1	1000	600	900			2	4	9	15	17	14	10	8	
×	Plantroom Supply Ductwork	1	1000*	600*	600		*	1	2	7	10	11	9	8	7	

*Cross-section dimensions to be designed to ensure additional pressure drop due to silencer is satisfactory for system/ fan operation

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