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Project Union

Planning Condition 19 and 20 Report

Ref: 75111/APP/2020/1955

17 October 2023

For

Ark Data Centres Ltd

Contents

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SUMMARY

Various buildings that form part of the new development proposed on a site at Bulls Bridge Industrial Estate in Hayes are subject to planning conditions relating to external building services plant noise emissions.

auricl has undertaken an acoustic assessment of the plant in relation to the planning condition requirements.

The plant noise levels at the nearest noise sensitive properties are predicted to be less than the noise limits specified by the planning conditions.

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Report Produced by	Nicholas Jones BEng(Hons) CEng MIOA	T: 07739 715411 E: njones@auricl.com
auricl Limited www.auricl.com hello@auricl.com	107 Cheapside **London** EC2V 6DN	9 Greyfriars Road **Reading** RG1 1NU

Registered Company 09824075

1.0 Introduction

Various buildings that form part of the new development proposed on a site at Bulls Bridge Industrial Estate in Hayes are subject to planning conditions relating to external building services plant noise emissions.

auricl has been instructed to undertake an acoustic assessment of the plant in relation to the planning condition requirements.

This report presents the noise limits and our acoustic assessment.

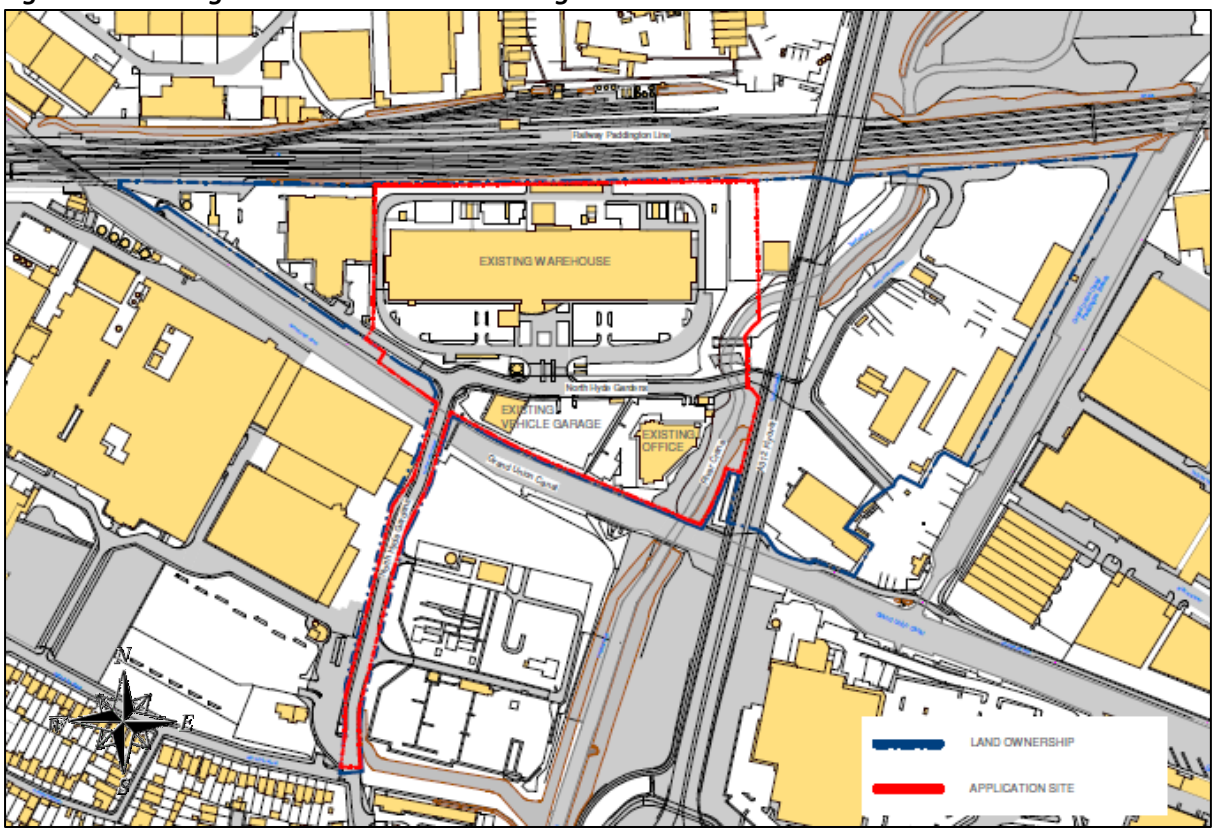
2.0 Description of Site

The site is located on North Hyde Gardens in Hayes and is currently under development. The site is bounded to the north by a railway line, to the south-west by a river and to the east by a raised carriageway (The Parkway

The site surroundings are predominantly industrial.

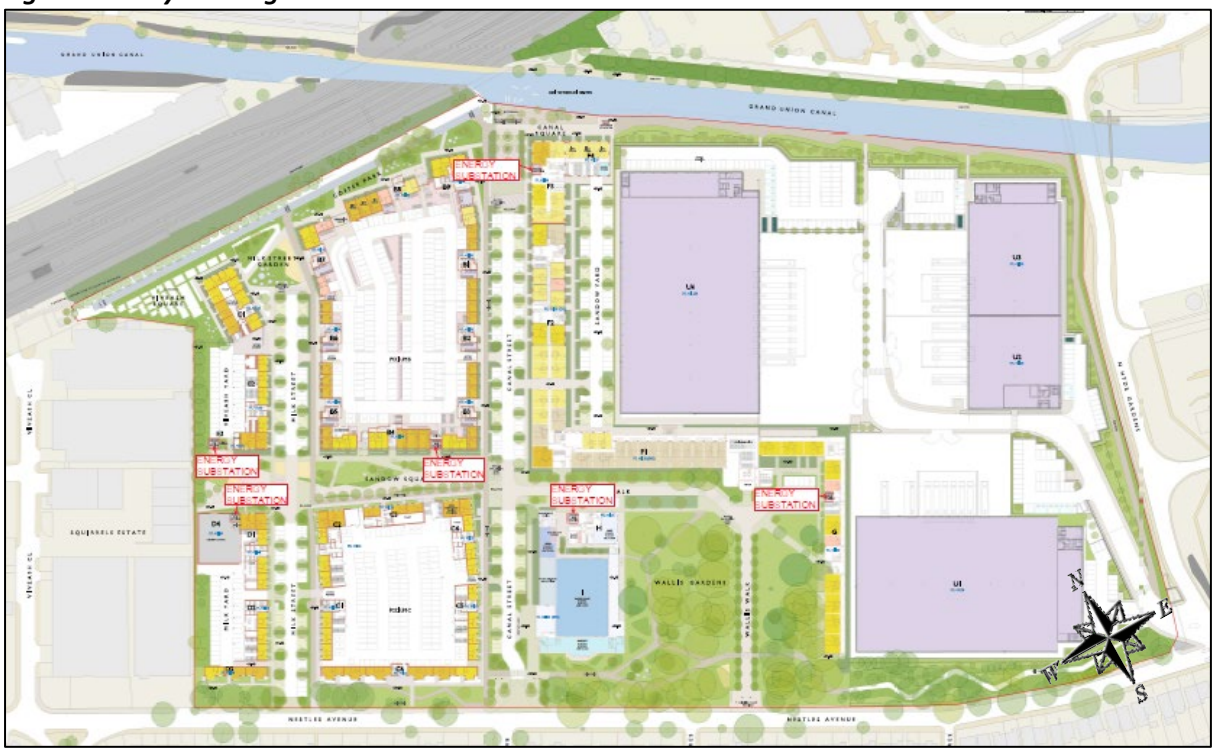
Figure 2.1 shows the approximate existing site extent in **red** and the surrounding properties.

Figure 2.1 Existing Site Extent and Surroundings



A residential development (Hayes Village) is currently under construction to the south-west of the site (to the south-west of the river). The current proposed site plan for this development is shown in Figure 2.2.

Figure 2.2 Hayes Village Site Plan



The proposed residences at the north-eastern corner of the Hayes Village development site are considered to represent the nearest noise sensitive properties to the proposed site.

3.0 Planning Condition Requirements

3.1 Planning Condition 19

Planning condition 19 states:

"*The development shall not be operated until full and final details are provided to, and approved by, the Local Planning Authority of all normal (non-emergency) operational plant (that emit sound to the atmosphere) and any associated noise control.*

The plant shall be selected and installed, together with any associated screening, so as to minimise sound externally to a practicable minimum, such that the daytime (07-23) and night-time (23-07) cumulative rating levels (of all plant associated with the data centre operation), determine in accordance with BS 4142 at 1 m from any residential premises (i.e. those within the Hayes Village development and south of Nestles Avenue), do not exceed 46 dB and 39 dB, respectively (as per Table 6.1 of the Plant Noise Assessment Report ref. R/PNA/1/220315, Version 01, dated 15 March 2022)."

3.2 Planning Condition 20

Planning condition 20 states:

"*The development shall not be operated until full and final details are provided to, and approved by, the Local Planning Authority of the standby generator plant and any associated noise control.*

The plant shall be selected and installed, together with any associated screening, so as to minimise sound externally to a practicable minimum, such that the daytime (07-23) and night-time (23-07) cumulative rating levels (from all generator plant), determine in accordance with BS 4142 at 1 m from

any residential premises (i.e. those within the Hayes Village development and south of Nestles Avenue), do not exceed 55 dB and 51 dB, respectively (as per Table 6.1 of the Plant Noise Assessment Report ref. R/PNA/1/220315, Version 01, dated 15 March 2022).”

4.0 Building Services Plant Noise Emissions

4.1 External Noise Limits

Based on the planning conditions detailed in Section 3.0, the plant noise limits are shown in Table 4.1.

Table 4.1 Plant Noise Limits

Scenario / Planning Condition	Maximum $L_{Aeq\ (15\ min)}$ Noise Level (dB) at Nearest Noise Sensitive Property	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
Normal / Planning Condition 19	46	39
Emergency / Planning Condition 20	55	51

The noise limits are not to be exceeded at a distance of 1m from the nearest noise sensitive property and apply to the cumulative total noise level due to all plant operating during the relevant period.

4.2 Proposed Plant

The proposed items of external building services plant are described in Table 4.2 for each building, as well as the noise data used in our assessment.

Table 4.2 Plant Description

Building	Plant Type	Description	Plant Noise Level (dB)
EC1	Generators	Twelve units	See Table 6.4 below
	EC1 -OU-105 & 205 - FCU	Located on roof	67 dB L_{pA} at 1m
	EC1 -OU-101 & 102 - CRAC	Located on roof	47 dB L_{pA} at 5m
EC2	Generators	Twelve units	See Table 6.4 below
	MVHR units	Two units located on roof	31 dB L_{pA} at 3m
	CRAC condensers	Eight units located on roof	42 dB L_{pA} at 5m

Building	Plant Type	Description	Plant Noise Level (dB)
	Condensers – big	Two units located on roof	79 dB L_{wA}
	Condensers – small	Two units located on roof	75 dB L_{wA}
EC3	Generators	Twelve units	See Table 6.4 below
	Heat pump condensers	22 units (14 operational at any one time) in acoustic louvred plantroom (Caice SS150)	69 dB L_{wA}
	CRAC condensers	6 units (4 operational at any one time) in acoustic louvred plantroom (Caice SS150)	77 dB L_{wA}
	MVHR unit	Louvred plantroom	37 dB L_{pA} at 3m
VRC1	Condenser unit	Roof (1No)	65 dB L_{wA}
	Condenser unit	Roof (3No)	64 dB L_{wA}
VRC2	Condenser unit	Roof (1No)	65 dB L_{wA}
	Condenser unit	Roof (3No)	64 dB L_{wA}

Note: L_{pA} = sound pressure level at specified distance, L_{wA} = sound power level
** = attenuation required, see Table 4.3 below*

Our calculations include the following:

- No line of sight between any plant and the nearest noise sensitive properties, due to a solid external facing to the gantries (e.g. steel) and screening provided by intervening buildings and solid structures
- Sound power levels for fans/AHUs/MVHR/evaporative cooling are total levels including casing and inlet/outlet noise – attenuators/casing upgrades/acoustic lagging to be specified by manufacturer so as not to exceed the specified total sound power level

Noise levels for the generators are based on data from the manufacturer (AVK) combined with typical reductions for part-load operation. The noise levels used in our calculations are shown in Table 4.3.

Table 4.4 Generator Noise Levels

Building	Generator	Load (%)	Noise Level Reduction Compared to 100% Load (dB)	Radiated Sound Power Level (dB L_{wA})		
				Outlet	Casing	Inlet
EC1	1	83	-1	76	97	80
	2	93	0	77	98	81
	3	93	0	77	98	81
	4	68	-2	75	96	79
	5	68	-2	75	96	79
EC2	6	93	0	77	98	81
	7	93	0	77	98	81
EC3	8	71	-2	75	96	79
	9	93	0	77	98	81
	10	83	-1	76	97	80
	11	93	0	77	98	81
	12	71	-2	75	96	79

4.3 Nearest Noise Sensitive Properties

We have considered the nearest noise sensitive properties to be the proposed residences at the north-eastern corner of the Hayes Village development.

4.4 Plant Noise Predictions – Planning Condition 19

Our calculations to predict the total plant noise levels at the nearest noise sensitive properties are summarised in Table 4.4.

Table 4.4 Plant Noise Emission Calculations Summary – Planning Condition 19

Parameter	Level (dB)	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
Predicted Noise Level at Receptor	29	29
Limit	**46**	**39**

It can be seen that the noise levels associated with the plant are predicted to achieve the planning condition 19 noise limits at the nearest noise sensitive properties.

4.5 Plant Noise Predictions – Planning Condition 20

Our calculations to predict the total standby plant noise level at the nearest noise sensitive properties are summarised in Table 4.5.

Table 4.5 Plant Noise Emission Calculations Summary – Planning Condition 20

Parameter	Level (dB)	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
Predicted Noise Level at Receptor	50	50
Limit	**55**	**51**

It can be seen that the noise levels associated with the plant are predicted to achieve the planning condition 20 noise limits at the nearest noise sensitive properties.

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ($20x10^{-6}$ Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
L_{Amax}	The A-weighted maximum noise level measured during the measurement period.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T. This is the sound level that is equivalent to the average energy of noise recorded over a given period.
$L_{A90,\ T}$	The A-weighted noise level exceeded for 90% of the time (also referred to as the background noise level), measured over the time period T. BS 4142: 2014 specifies that T= 1 hour for daytime periods and T = 15 minutes for night-time periods.