

Technical Note

Project Name: Land South of Westwells Road, Corsham	Author: Mercedes Astrain
Project Reference: 65204515-007	Date: 20.01.26
Project Manager: Mercedes Astrain	Document Reference: 65204515-007-SWE-ZZ-XX-T-U-0004 Revision: C01

<u>Rev.</u>	<u>Date</u>	<u>Reason for issue</u>	<u>Prepared</u>	<u>Reviewed</u>	<u>Approved</u>
C01	20.01.26	S2 – For Information	MA 20.01.26	HM 20.01.26	MA 20.01.26

Spring Park P6 Low Frequency Impact Assessment

1 Introduction

Sweco UK have been commissioned by Ark Estates 4 Limited to review comments from Damaris Broad, Environmental Control and Protection Officer at Wiltshire Council (WC), on the low frequency impact from the proposed data centre development. This document contains a description of the comment received, and the assessment requested.

2 Comment and Responses

2.1 Methodology and Impact Levels

WC EHO comment:

“Since the last planning committee meeting there has been quite a bit of contact from residents regarding tonal noise from the proposed data centre (plus existing noise issues).

They are still concerned about tonal noise and how they feel it has been dismissed with this application. With another application where it was a concern (which the residents are aware of), the noise consultant took the unweighted Sound Power Levels in each octave band (provided on the data sheets), then considered attenuation, and predicted the Sound Pressure Levels in each octave band within the receptor’s property. Assumptions were made that a semi open window reduced the noise by 10-15dB. They compared the low frequency values to the reference curve found in NANR45. The values in NANR45 had to be converted from 3rd Octave to octave bands,”

2.2 Low Frequency Desktop Assessment

Following the request above, we have undertaken a desktop assessment following the methodology described in the request from WC EHO.

2.2.1 Methodology and Criteria

From the email request, it is understood that the low frequency should be evaluated in accordance with the “Proposed criteria for the assessment of low frequency noise disturbance” – NANR45 document produced by Salford University for DEFRA. The

document provides a reference curve to assess the low frequency measured at a location. The reference curve is presented below.

Table 1 : Proposed Curve reference in NANR45 Procedure, dB L_{eq}													
Description	Third Octave Band Centre Frequency, Hz												
	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
L _{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34

If the noise levels at the receptors' location do not exceed the levels above during the night-time, it is proved that there is no presence of adverse low frequency environmental noise. For daytime, a 5 dB relaxation can be applied.

As acknowledged in the request, in absence of third octave data for the noise predictions, the NANR45 should be converted to octave band.

The NANR45 curve converted to octave bands is presented in table below.

Table 2: Curve reference in NANR45 Procedure converted to Octave bands, dB				
Description	Octave Band Centre Frequency, Hz			
	16	31.5	63	125
L _{eq}	88.6	64.8	46.6	41.1

It should be also noted that the noise data input provided by the plant manufacturers and the design team, used in the planning noise assessment, only include data for 63 Hz to 8000Hz frequency bands, which is an industry standard practice. Therefore, the current assessment will not be able to undertake any comparison for frequency bands below 63Hz.

2.2.2 Assessment of Normal Operations

The assessment of the impact of low frequency has been undertaken using the predicted impact of sound from the normal operation of the P6 Data Centre. The assessment is based on a comparison between the predicted L_{eq} sound levels from all the plant considered in the planning noise model, including the ventilation inlet and outlet louvers, the ancillary block and energy centre external plant, and substation transformers included in the normal operation regime for P6, with the NANR45 curve reference presented in Table 1 and 2 above. The assessment has been done for the nearest and most exposed noise-sensitive receptors in the vicinity.

Sound predictions were carried out in the noise-modelling suite Cadna/A, in accordance with the ISO 9613:1996 prediction methodology.

For the purposes of this assessment, it is assumed that all the internal plant for the ventilation of the data suites will operate simultaneously and continuously, except for the pressure relief dampers that are assumed to only operate when the gas suppression system is activated, which is in case of fire, and therefore not considered as part of the site operation.

This is representative of a reasonable worst-case scenario for the normal operation, as explained in section 5.2 in report 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco, assuming maximum IT capacity.

In relation to the ancillary block services plant, it is assumed that all the external plant will operate simultaneously and continuously except for certain elements as advised by the designers and presented in Section 5.1 in report 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco.

All the mitigations presented in Section 5.2 in report 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco have been included in the predictions.

Section 5.2 in report 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco, presents all the noise data for all the plant included in the noise predictions. Please note that generally all the noise data in 1/1 octave frequency bands in the tables are linear and non A-weighted. For the ventilation inlet and outlet data (Table 4) the frequency data are presented as A-weighted in the planning report, but please notice that this is not affecting the results which are presented as linear values (non A-weighted) as the modelling software Cadna/A, allows for extracting results in all forms, when the input data are correctly set out.

In relation to the mitigations included in the design, the following is summarising the mitigations included in the planning noise model and report:

- Reduction of the Ventilations Systems noise according to an 80% IT load (which is high).
- Acoustic attenuators (2800mm) included in the inlet for each module (data in Table 5 in the report reference 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco).
- Acoustic louvres for the Outlets of each module (data in Table 6 in the report reference 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco).
- Enclosure around the Outlet louvres, with acoustic absorptive Class A panels in the interior.
- Acoustic attenuators (2500x2800mm) at the top of the outlet chimney enclosure of each module (data in Table 6 in the report reference 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco).
- Acoustic attenuators for all the AHUs in the ancillary plant room and roof (data in Table 8 in the report reference 65204515-007-SWE-ZZ-XX-T-U-0001 Rev. C02 by Sweco).
- Sound Reduction for night-time operation for CRAC External Condensers for lower temperatures.
- Sound Reduction for night-time operation for MMR External Condensers for lower temperatures.
- Sound Enclosures for Battery Room External Condensers.

The mitigations above were maximized along with the MEP design team. In the table below the predicted noise levels at the façade of the closest and worst-affected noise sensitive receptors are presented in dB.

As proposed in the methodology requested by the WC EHO, an open window sound reduction could be considered as 10-15 dB. In the next tables the estimated internal noise levels per frequency bands are also presented based on this reduction and the predicted noise levels at the façade. Receivers have been considered at 4 metres high, typically representative of first floor bedrooms.

Table 3: NANR45 Curve Assessment in Octave bands, dB – Night-time				
Description	1/1 Octave Band Centre Frequency, Hz – Night-time			
	16	31.5	63	125
NANR45 L_{eq} Night	88.6	64.8	46.6	41.1
Westwells Road (north) – façade level	-	-	47	23
Westwells Road (north) – Internal Levels with open window	-	-	32-37	8-13
Moor Green (south) – façade level	-	-	47	25
Moor Green (south) – Internal Levels with open window	-	-	32-37	10-15

Table 4: NANR45 Curve Assessment in Octave bands, dB – Daytime				
Description	1/1 Octave Band Centre Frequency, Hz – Daytime			
	16	31.5	63	125
NANR45 L_{eq} Day	93.6	69.8	51.6	46.1
Westwells Road (north) – façade level	-	-	48	31
Westwells Road (north) – Internal Levels with open window	-	-	33-38	16-21
Moor Green (south) – façade level	-	-	47	30
Moor Green (south) – Internal Levels with open window	-	-	32-37	15-20

As it can be observed in the tables above, the predicted internal levels are **well below** the **NANR45 curve** reference levels (results in green). Therefore, the predictions for P6 proved that there is no presence of adverse low frequency environmental noise, based on the results for the proposed design.

3 Conclusions

This technical note is deemed to have responded accurately and appropriately to the request raised by WC.