

Design Note.

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External plant noise assessment.

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	31/10/2024	For issue.	SG	AP	PM

1. Introduction.

Hoare Lea has been appointed to provide acoustic advice for the new plant installation associated with the proposed clean room at the Christie Hospital Wolfson Molecular Imaging Centre.

A noise survey has been undertaken, and plant noise limits set in line with Manchester Council planning requirements. This is presented within planning noise assessment report reference “1015731-HLE-RP-AC-Noise assessment report-Rev00”.

This note presents the noise assessment of the current plant proposals at the nearby residences, as well as within the nearby noise-sensitive spaces in the Hospital.

2. Design criteria.

To achieve compliance with the recommendations of the planning report, the following maximum sound level at 1 m from the nearest noise sensitive premises must be achieved:

Period	Maximum sound level at 1 m from the nearest noise sensitive premises, dB L _{A,r,T}
Daytime (0700-2300)	≤ 44
Night-time (2300-0700)	≤ 42

Table 1: Planning noise limits.

Floor plans have been received for the Wolfson Molecular Imaging Centre (WMIC). These show that the most noise-sensitive spaces overlooking the proposed plant area are the first-floor offices. The closest

window is approximately 8 metres from the plant compound, and there is no screening currently proposed (except visual screening). Within HTM 08-01, the internal noise level criteria are presented below:

Room name	Room type	Internal noise level criteria
Office Area	Small office-type space	$\leq 40 \text{ dB } L_{Aeq,T} / \text{NR } 35$

Table 2: HTM 08-01 internal noise level criteria.

It is generally recommended that noise from external plant is not the dominant noise source within offices. On this basis, a suitable target is to achieve a noise level of approximately 10 dB below the HTM 08-01 criteria if possible.

3. Proposals.

The main items of noise generating plant proposed are as below:

Equipment	Number	Sound power level per unit, dB L_{WA}
Daikin EWAT050CZP-A2 Air Cooled Chiller	2	81
Samsung AM050BXMDER/EU DX unit	4	69

Table 3: Proposed external plant equipment.

The other noise sources are either likely to be significantly quieter than the above or are located internally and suitable in-duct attenuation can be provided as the design develops.

The locations of the proposed plant equipment are presented below:

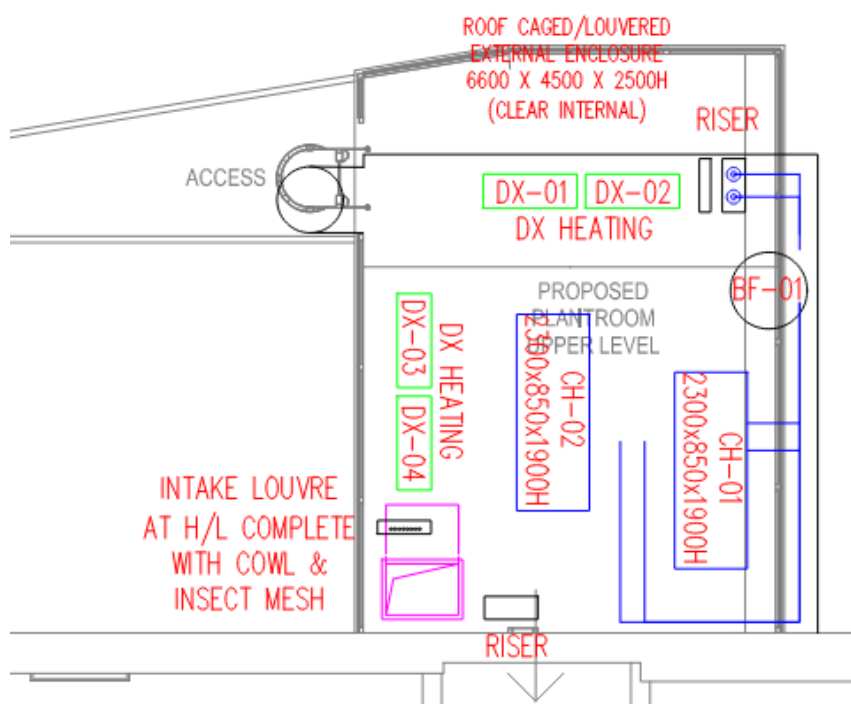


Figure 1: External plant layout showing locations of external chillers and DX units.

4. Noise assessment.

4.1 Planning.

The closest residents are approximately 60 m from the plant compound. Assuming no screening as currently proposed, and no mitigation to the units, the resultant sound level is presented below:

Period	Plant noise limit, dB $L_{A,r,T}$	Calculated sound level, dB $L_{Aeq,T}$
Daytime (0700-2300)	≤ 44	35
Night-time (2300-0700)	≤ 42	35

Table 4: Planning noise assessment summary.

On the basis of the above, the units are calculated to achieve the planning noise limits. It is worth noting that the limits are *rating levels* in accordance with BS 4142. This includes any appropriate acoustic character corrections, such as tonality, intermittency, or impulsivity. As the calculated sound levels are 7 dB below the limits, this would allow some degree of audible tonality or intermittency of the units.

4.2 Hospital.

The worst affected room within the hospital is likely to be one of the first-floor offices within the WMIC. It is understood that these spaces have a sealed façade and mechanical ventilation, therefore windows can be assumed to be closed for the purposes of the noise assessment.

The glazing type is unknown, so as a conservative estimate, a basic 4-12-4 double-glazed system (4 mm glass – 12 mm air gap – 4 mm glass) has been assumed, achieving a sound insulation performance of $R_w + C_{tr}$ 26 dB. It is likely the windows will achieve a high performance than this in reality.

The noise assessment for the offices is presented below on this basis:

Room	External noise level	Internal noise level	Internal noise criteria
Office Area	50 dB $L_{Aeq,T}$ NR 45	27 dB $L_{Aeq,T}$ NR 23	≤ 30 dB $L_{Aeq,T}$ $\leq$ NR 25

Table 5: Hospital internal noise assessment.

As presented above, calculations show that the noise level within the closest office space with windows closed achieves the recommended limit of 10 dB below the HTM 08-01 criteria.

5. Summary.

A noise assessment has been undertaken based on the drawings and selections provided by the project mechanical engineer.

The results show that the current selections achieve the limits within the planning noise report at the closest residents, and achieve suitable internal noise levels within the nearby hospital offices in accordance with HTM 08-01.

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