

Design Note – Planning Condition 17 – Plant Noise Impact Assessment

Project GMMH Park House	Project No. 1028427	Date 25/06/2024
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1.0 Introduction

This purpose of this design memorandum is to present the design stage noise impact assessment for new external plant items associated with the Park House development at North Manchester General Hospital, in accordance with the requirements of Planning Condition 17 attached to the proposed development (Application Ref: 132567/JO/2021)

Planning Condition 17 relates to noise from items of external plant and states :

"Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. The scheme shall be submitted to and approved in writing by the City Council as Local Planning authority in order to secure a reduction in the level of noise emanating from the site. The approved scheme shall be completed before the apartments are occupied.

Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria has been met. Any instances of nonconformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To safeguard the amenity of existing and future occupiers of nearby

residential accommodation, pursuant to saved policy DC26 of the Unitary Development Plan for the City of Manchester and policies SP1 and DM1 of the Core Strategy."

2.0 Environmental noise survey

The determination of existing representative background sound levels at the site has been informed by environmental noise survey results presented in the WSP acoustic report submitted in support of the initial application (Ref: 70069934-R1 September 2020).

The WSP environmental noise survey was undertaken between approximately 11:30 hours on Tuesday 8 September 2020 and 14:30 hours on Tuesday 15 September 2020. The survey consisted of continuous unattended measurements at two measurement locations as highlighted in Figure 1, below. Also presented is the approximate red line site boundary and worst case affected off-site noise sensitive receptors.

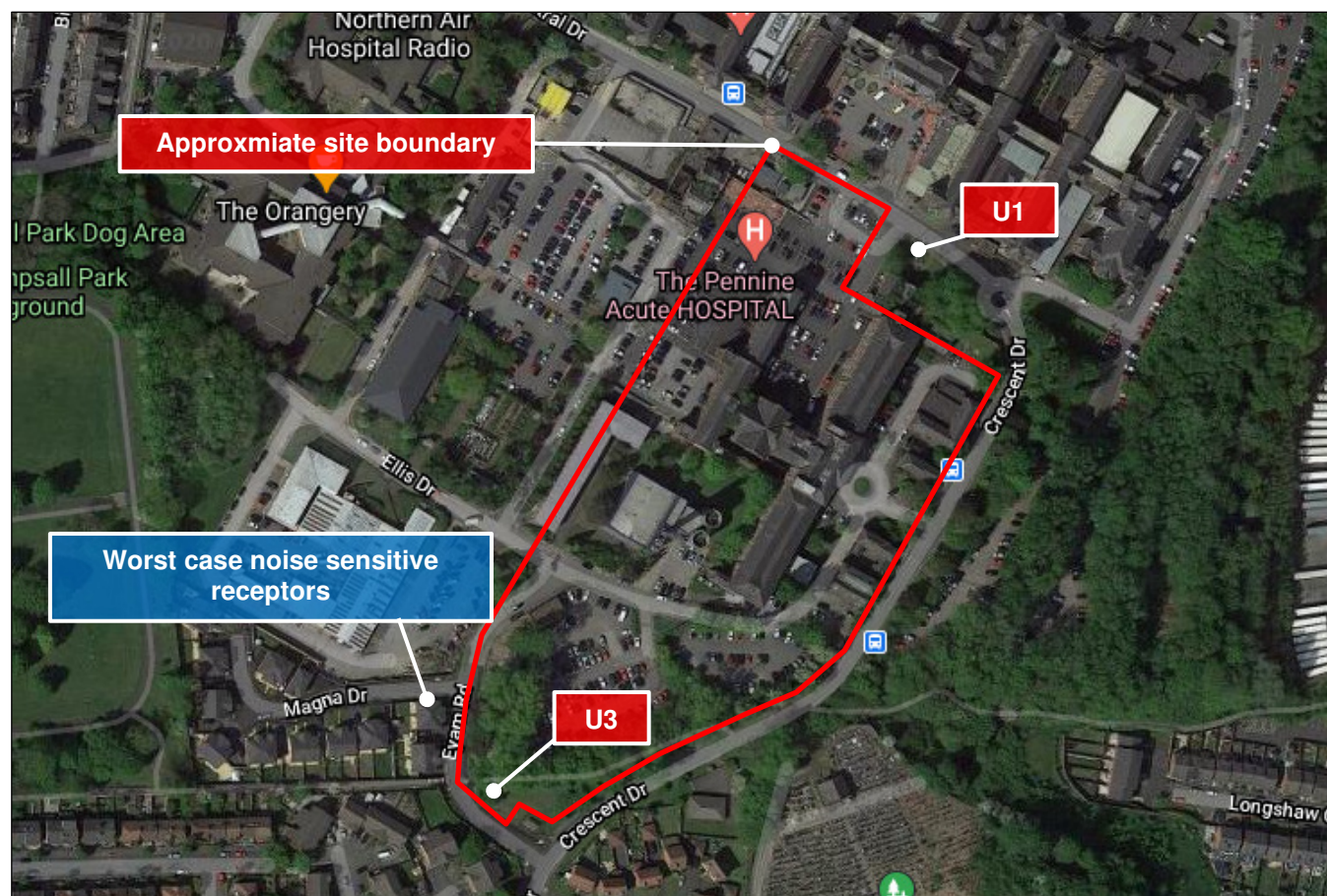


Figure 1: WSP noise measurement positions

The representative background sound level results for positions U1 and U3 are shown in Table 1, below. This has been reproduced from Table 3-7 of the WSP report.

Location	Period	L _{A90,15mins}
U1	Daytime	44 dB
	Night-time	40 dB
U3	Daytime	42 dB
	Night-time	35 dB

Table 1: Representative background levels (Table 3-7 of WSP report)

3.0 Proposed plant noise emission limits

Based on WSP noise survey results obtained at position U3, the resultant plant noise emission limits in accordance with Planning Condition 17 requirements (i.e. 5 dB below representative background sound level) are presented in Table 2:

Time period	Representative background sound level dB $L_{A90,T}$	BS 4142 plant noise rating level limit dB $L_{A,T,r}$ to be achieved at 1 m from the nearest residential dwelling
Daytime (07:00-23:00 hrs)	42	≤ 37
Night-time (23:00-07:00 hrs)	35	≤ 30

Table 2: Limiting noise level for non-emergency plant

The above limit is applicable to the cumulative noise level from all new items of plant when running under normal operation. Where applicable, acoustic feature corrections shall be applied to the specific plant noise level to account for any distinguishable acoustic characteristics (e.g. tonality, impulsivity, intermittency).

4.0 Plant proposals

The dominant source of new noise generating plant associated with the scheme will be attributable to Air Handling Units (AHUs) and Air Source Heat Pumps (ASHPs). The proposed locations of new AHUs and the external ASHPs are detailed in the layout reproduced in Appendix I to this Design Note.

Data provided by Ramboll UK quotes the following sound power levels for new AHUs associated with the scheme:

AHU reference	Fan reference	Spectral sound power level, L_w (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
AHU Entrance Block	Supply Inlet	48	69	60	50	45	33	19	0
	Extract Outlet	52	65	69	72	74	64	62	54
	Casing Breakout	60	67	57	48	51	39	34	27
AHU FM	Supply Inlet	49	61	63	52	41	35	23	5
	Extract Outlet	54	57	72	70	72	69	66	62
	Casing Breakout	61	59	59	47	49	42	38	34
AHU Kitchen	Supply Inlet	53	75	62	51	41	33	17	2
	Extract Outlet	59	69	71	72	70	68	64	60
	Casing Breakout	69	72	59	50	49	43	37	32
AHU Wards 1 & 4	Supply Inlet	51	76	66	55	48	36	24	8
	Extract Outlet	58	75	76	77	76	68	67	64
	Casing Breakout	65	75	62	53	52	42	39	36
AHU Wards 2 & 5	Supply Inlet	50	73	62	55	48	39	25	8
	Extract Outlet	55	67	72	77	73	70	67	61
	Casing Breakout	63	70	58	53	51	44	39	34

AHU reference	Fan reference	Spectral sound power level, L _w (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
AHU Wards 3 & 6	Supply Inlet	53	79	68	56	51	38	25	13
	Extract Outlet	61	75	77	79	78	70	70	68
	Casing Breakout	67	78	64	55	55	44	41	40
AHU Ward 7	Supply Inlet	75	69	64	61	64	59	49	39
	Extract Outlet	58	72	76	76	74	70	68	64
	Casing Breakout	65	73	63	52	50	44	40	36
AHU Wards 8 & 9	Supply Inlet	48	69	60	50	45	33	19	0
	Extract Outlet	52	65	69	72	74	64	62	54
	Casing Breakout	60	67	56	48	51	39	34	26

Table 3: AHU noise data

The sound power data for the five proposed ASHPs is given below:

Plant item	Quantity	Spectral sound power level, L _w (dB)						
		125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Powermaster WSAW-YSC4 120.4	3 units	70	79	81	83	80	72	62
Powermaster WSAW-XSC3 120.4	2 units	85	85	83	83	80	66	57

Table 4: ASHP noise data

5.0 Assessment procedure

In order to determine plant noise propagation to the nearest effected residential properties, a model has been produced using SoundPLAN 8.2 acoustic modelling software. This model is capable of accurately determining sound propagation by taking into account variations in topography, barrier attenuation provided by existing landscaping and buildings, and distance attenuation.

The noise propagation at the nearest-noise sensitive receptors identified has been calculated. The nearest off-site residential noise sensitive receptors have been identified as residential properties located on Eyam Road.

Spectral data indicates that items of plant do not require a feature correction for tonality. It is understood that plant items will generally operate in a steady state and will not rapidly ramp up or down, and as such no acoustic feature corrections for impulsivity and intermittency have been applied.

It is understood that no more than four of the Air Source Heat Pumps will be operational simultaneously.

The modelling process has also considered proposals to mitigate noise from the ASHP compound with a 4 m tall imperforate timber barrier with a minimum surface density 10 kg/m². A visualisation of the ASHP compound screen is presented in Figure 2, overleaf.

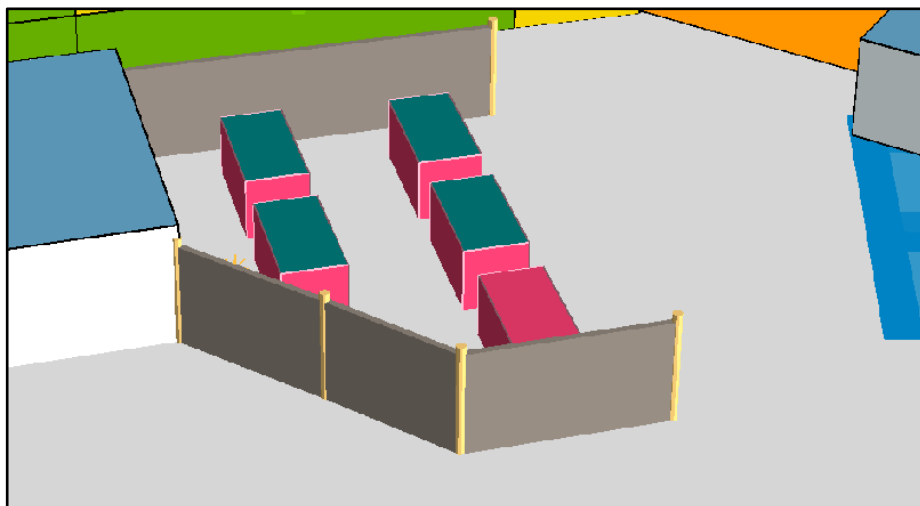


Figure 2: Extent of 4 m tall acoustic barrier

It should also be noted that the noise model has not considered atmosphere-side supply ductwork losses or additional acoustic screening afforded by plant weather screen louvres. As such, predicted levels from the model can be considered worst-case.

The results are summarised in Table 5 below:

Location	Scenario	Rating level limit, $L_{Ar,Tr}$ dB	Worst case calculated cumulative specific sound level, L_{Aeq} dB	Acoustic feature correction, dB	Calculated rating level at noise-sensitive receptors, $L_{Ar,Tr}$ dB	Assessment outcome
Nearest off-site residential receptors (Eyam Road)	Daytime plant limits	37	30	+0	30	Compliance with proposed plant noise level rating level limits
	Night-time plant limits	30	30	+0	30	

Table 5: Plant noise assessment results

As can be seen from the results detailed in Table 5, plant proposals are expected to comply with Local Authority Planning requirements as detailed in Planning Condition 17.

6.0 Validation testing

Planning Condition 17 states that pre completion testing must be undertaken with a validation report provided to ensure compliance with the proposed noise limits. Once all items of plant are fully installed and commissioned, Cundall will undertake these measurements and provide a verification report suitable for the full discharge of the planning condition.



