

Design Note

To:	Simon Glass <Simon.Glass@turntown.co.uk>; Gareth Whitaker <Gareth.Whitaker@cpwp.com>; Connor McAlorum <C.J.McAlorum@mmu.ac.uk>
Cc:	Al Plail <AlPlail@hoarelea.co.uk>; Phil Mann <PhilMann@hoarelea.co.uk>
From:	Sam Garne, Senior Acoustics Engineer
Date:	17 June 2022
Project:	MMU MTC Building
File ref:	NOTE-1013778-5A-SG-20220617-Plant noise emissions assessment.docx

MMU MTC Building – plant noise emissions.

1. Introduction.

Hoare Lea has been appointed to carry out a noise assessment for the proposed rooftop plant installation at the MMU MTC Building.

The proposal is for four new VRF units to be located on the roof and two existing air handling units (currently out of operation) to be re-used.

This report is suitable for submission to the Local Authority to confirm that the proposed plant equipment is predicted to achieve the stipulated plant noise limits at the closest noise-sensitive receptor.

2. Design criteria.

Suitable plant noise limits have been provided previously for the development within report reference 'REP-1012825-AP-20210316-Acoustic planning report-Rev01' dated 19/03/2021. A summary is provided below.

An environmental noise survey has been carried out and a noise egress assessment undertaken in accordance with BS 4142:2014 and Manchester City Council (MCC) requirements. The survey was carried out between 26th February and 2nd March 2021.

The closest noise-sensitive receptor to the proposed development has been identified as the Vita Living residential premises to the north-east.

The representative background sound levels at the nearby sensitive receptors were 54 dB $L_{A90,5min}$ during the daytime (07:00 to 23:00 hrs) and 47 dB $L_{A90,5min}$ during the night-time (23:00 to 07:00 hrs).

Based on MCC criteria, all plant, equipment and machinery associated with the development shall be controlled to ensure that the overall sound pressure levels at 1 m from the façade of the nearest noise sensitive premises (Vita Living) do not exceed 49 dB $L_{Aeq,T}$ during the daytime (07:00 to 23:00 hrs) and 42 dB $L_{Aeq,T}$ during the night-time (23:00 to 07:00 hrs). If the plant contains any tonal characteristics a further correction will be required.

The criteria are summarised below on this basis:

Period	Plant noise limit at 1 m from the façade of the closest noise-sensitive receptor, dB $L_{Aeq,T}$
Daytime (0700-2300)	49
Night-time (2300-0700)	42

Table 1: Plant noise emissions limits, from REP-1012825-AP-20210316-Acoustic planning report-Rev01.

3. Proposed external equipment.

The proposal is for four new VRF units to be located on the roof and two existing air handling units (currently out of operation) to be re-used. The equipment models proposed are presented below:

- 4 no. VRF units:
 - 2 no. Mitsubishi PURY-P200YNW-A1
 - 1 no. Mitsubishi PURY-P250YNW-A1
 - 1 no. Mitsubishi PURY-P600YSNW-A1
- 2 no. Air handling units
 - 2 no. CIAT Floway Access RHE 3000

The VRF units are proposed approximately 75 m from the closest noise-sensitive receptor, and the AHUs are proposed 77 m and 83 m from the closest noise-sensitive receptor. The locations are presented in Figure 1.

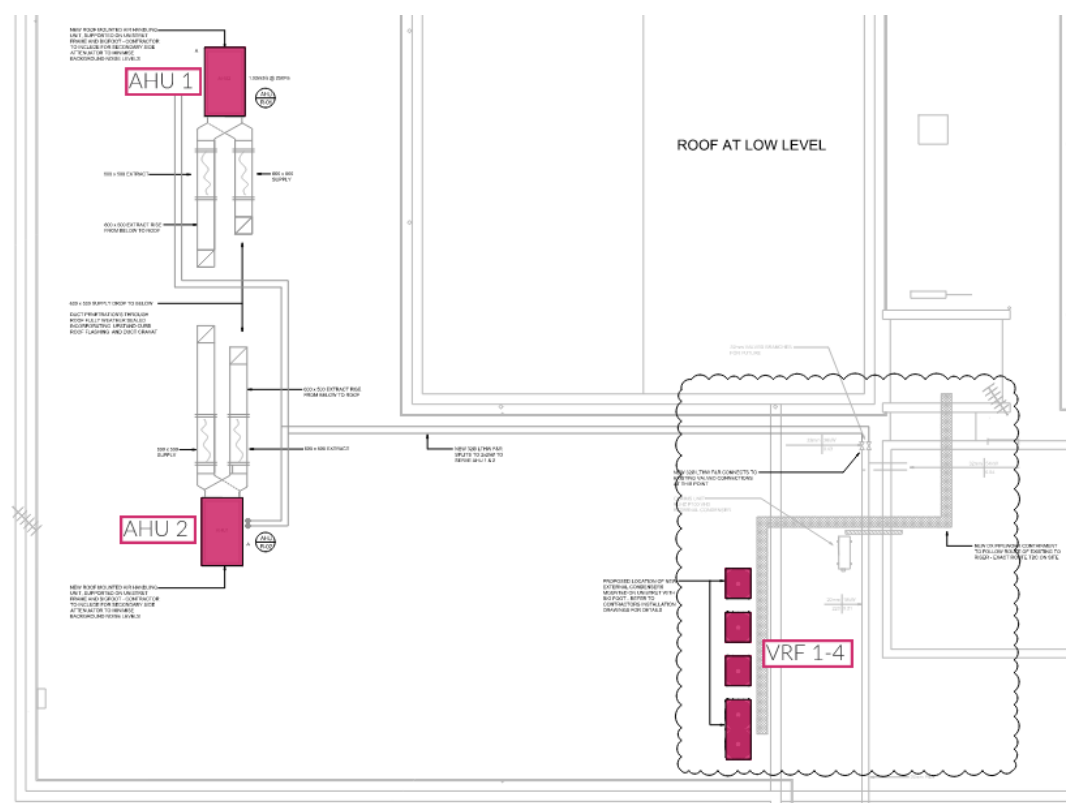


Figure 1: Partial roof plan with proposed plant equipment highlighted.

The manufacturers have provided noise data for these items of equipment. These are presented below:

Equipment	Overall, dB(A)	Frequency, dB								
		63	125	250	500	1k	2k	4k	8k	Hz
PURY-P200YNW-A1	75	85	77	76	74	68	63	64	58	dB
PURY-P250YNW-A1	77	85	78	78	76	70	65	66	60	dB
PURY-P600YSNW-A1	87	94	90	88	85	80	76	72	68	dB
AHU 01 Intake	61	57	59	65	61	53	49	39	34	dB
AHU 01 Discharge	72	65	64	71	67	69	65	57	53	dB
AHU 01 Casing	69	76	74	70	63	64	62	44	44	dB
AHU 02 Intake	62	58	59	66	61	53	49	39	34	dB
AHU 02 Discharge	72	65	64	71	67	69	65	57	53	dB
AHU 02 Casing	69	76	74	70	64	64	62	44	44	dB

Table 2: Sound power levels for proposed equipment, from manufacturer's data.

4. Assessment.

Based on the data provided by the equipment manufacturers, a noise assessment has been carried out to consider whether the proposed plant equipment is compliant with the planning condition.

The predicted sound level at 1 m from the façade of the closest noise-sensitive receptor from each item of plant equipment is presented below, in addition to the total predicted level from all plant operating simultaneously.

Equipment	Predicted sound pressure level at 1 m from the façade of the closest noise-sensitive receptor, dB $L_{Aeq,T}$
VRF (PURY-P200YNW-A1)	27
VRF (PURY-P200YNW-A1)	27
VRF (PURY-P250YNW-A1)	29
VRF (PURY-P600YSNW-A1)	38
AHU 01	25
AHU 02	25
Total	40

Table 3: Predicted sound pressure levels at 1 m from the façade of the closest noise-sensitive receptor from each item of proposed plant equipment.



The predicted sound pressure level is compared with the planning noise limit in Table 4.

Period	Plant noise limit, dB $L_{Aeq,T}$	Predicted sound level, dB $L_{Aeq,T}$
Daytime (0700-2300)	49	40
Night-time (2300-0700)	42	40

Table 4: Predicted sound pressure level at 1 m from the façade of the closest noise-sensitive receptor compared with the planning noise limits.

As presented above, with all plant equipment operating simultaneously, it is predicted that the noise limit will be achieved during daytime and night-time hours.

5. Summary.

Hoare Lea has been appointed to carry out a noise assessment for the proposed rooftop plant installation at the MMU MTC Building.

Sound level data for the proposed equipment has been provided by the manufacturers.

The proposed plant equipment is predicted to meet the plant noise limits at the closest noise-sensitive receptor.