

To: Willmott Dixon
Attention: Tom Farrow
From: MACH Acoustics
Date: 30/05/2019
Project: University of Hertfordshire Sport Science
Subject: Early Stage Risk Assessment of the M&E Rooftop Noise Breakout

1.1 Introduction

MACH has been appointed to provide an early stage risk assessment of the M&E rooftop noise breakout at University of Hertfordshire. Some sound power data and attenuator specification are currently unavailable due to the ongoing design of the proposed equipment. Under this limitation, MACH has provided the plant noise limits at this stage to help the design and develop towards the targets set in Table 2. Please note that the plant noise limits provided in Table 4 are preliminary and could be achieved through the provision of attenuators or other means of mitigation such as relocation of the units. The detailed design of the M&E equipment will be reviewed at later stage.

1.2 Design Target

MACH has been in contact with the Environmental Health Technical Officer at Welwyn Hatfield Borough Council and has been advised the following:

“The impact of existing and new commercial noise sources should be assessed in accordance with BS4142:2014. When noise sources show signs of tonality we require noise levels to be 10dB below background noise level at the nearest receptor location. In instances where the noise source presents no tonality we require the noise level to be 5dB below the background noise level at the nearest receptor location.

In instances where large machinery or plant will be in operation we will require a pre testing noise impact assessment to be undertaken. This will be set as a discharge of condition and will require a further noise impact assessment to be undertaken and submitted for consideration. It is likely that any such condition will also stipulate maintenance requirements for the operation lifespan of the equipment.”

Based on the above, plant noise limits have been set as follows:

Presence of Tonality	Plant Noise Level Limit
Yes	10dB below background noise levels
No	5dB below background noise levels

Table 1. Plant Noise Level Limits

Position	Presence of Tonality	Time Period	Assessed Background Noise Level (dB LA90)	Plant Noise Limit dB LAeq,T	
				At Nearest Sensitive Receivers	At Nearest Teaching Window
Fixed	Yes	Daytime (07:00-23:00)	57	47	48
		Night-time (23:00-07:00)	42	32	-

Table 2. Plant Noise Limits

Plant noise break out should not adversely impact nearby residents but should also ensure that it does not impact the development itself. Therefore, plant noise breakout must meet both of these requirements.

1.3 Noise Source Location

The figure below illustrates the proposed rooftop equipment locations at this stage.

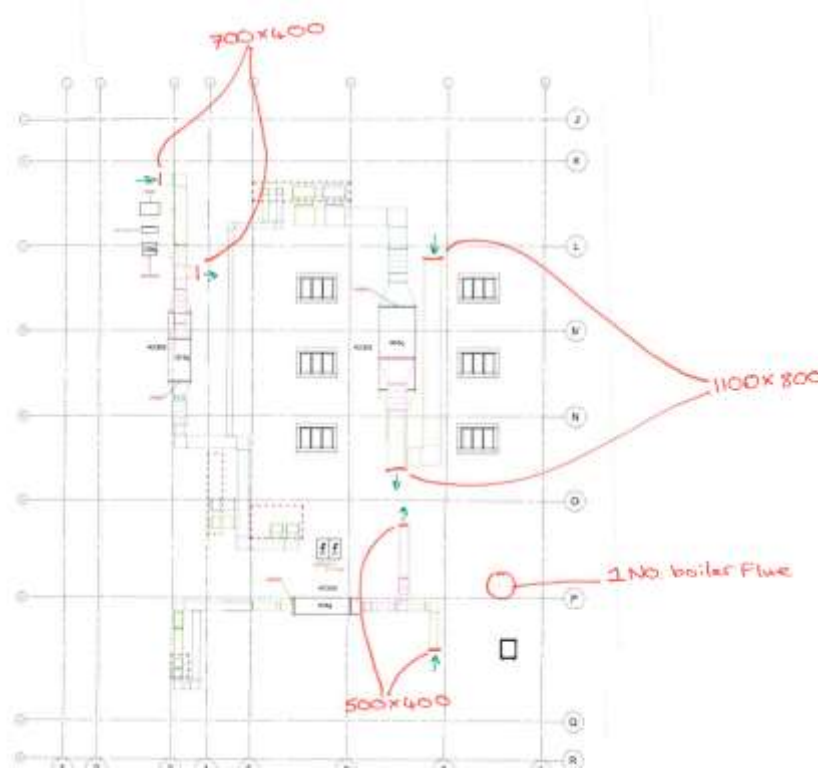


Figure 1: Plant Locations

1.4 Noise Level

The following noise levels have formed the basis of assessment. Spectral sound power level data for number of units were not available at the time of writing and has been annotated as 'TBC'.

Source		Sound Power Level dB, Octave Band Centre Frequencies, Hz							dB(A)	Operating Hours
		63	125	250	500	1000	2000	4000		
AHU01	Breakout	56	62	64	52	42	50	45	58	07:00 to 23:00
	Intake	60	65	72	67	59	60	57	69	
	Exhaust	62	64	67	70	72	72	69	77	
AHU02	Breakout	64	67	62	55	51	50	47	59	07:00 to 23:00
	Intake	68	74	72	71	65	63	60	72	
	Exhaust	71	78	76	78	75	74	71	81	
AHU03	Breakout	55	56	62	52	47	47	45	57	07:00 to 23:00
	Intake	56	60	70	65	60	58	57	67	
	Exhaust	68	64	72	71	71	72	70	77	
EXTC01	Breakout	94	90	85	85	77	75	73	86	24/7
EXTC02	Breakout	94	90	85	85	77	75	73	86	24/7
EXTC03	Breakout	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	24/7
ASU01	Breakout	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	07:00 to 23:00
AC01	Breakout	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	07:00 to 23:00
Boiler Flue	Breakout	34	47	57	62	50	57	54	65	24/7

Table 3. Proposed Equipment Sound Power Levels and Operating Hours

1.5 Noise Breakout Assessment

Residential areas along St Alban Road West to the south of the site are seen to be the worst effected receptors from the proposed rooftop plant. At this stage, the specification of attenuators for service terminals are not available. Based upon the given plant noise limits in Table 2, plant noise rating level has been provided at 1m away from the rooftop plant zone. In order to assess the worst case scenario, all associated equipment and duct terminations have the minimum distance of 57m to the receptors.

Equipment	Source	Provision for Attenuators	Source Characteristics	Acoustic Correction	Plant Noise Rating Limit (SPL) @1m from the proposed rooftop plant zone dB(A) L_{AeqT}	
					Daytime	Night Time
					07:00-23:00	23:00-07:00
AHU01	Breakout	No	Constant	+0	73	58
	Intake	Yes	Constant	+0		
	Exhaust	Yes	Constant	+0		
AHU02	Breakout	No	Constant	+0		
	Intake	Yes	Constant	+0		
	Exhaust	Yes	Constant	+0		
AHU03	Breakout	No	Constant	+0		
	Intake	Yes	Constant	+0		
	Exhaust	Yes	Constant	+0		
EXTC01	Breakout	No	Intermittent	+3		
EXTC02	Breakout	No	Intermittent	+3		
EXTC03	Breakout	No	Intermittent	+3		
ASU01	Breakout	No	Intermittent	+3		
AC01	Breakout	No	Intermittent	+3		
Boiler Flue	Breakout	No	Intermittent	+3		

Table 4. Plant Noise Rating Limits

Note: Table 4 is for guideline only. As the design progresses and the attenuator specified, a detailed assessment will be carried out at later stage to ensure the proposed M&E rooftop design complies with the planning noise breakout targets.