

MEMO P23-320-M02v1

Project:	P23-320 - New Building, Martin Harris Centre, University of Manchester
Date:	4 December 2023
To:	Michael Hicks – University of Manchester
From:	Donald Quinn BSc FIOA, Managing Director
Subject:	Internal music noise break-out – Verification noise measurements

Following our recent visit to site, I am writing with the findings of our verification noise measurements in respect of music noise break-out from the building.

Introduction

The verification noise measurements have been requested in connection with the discharge of Condition 14b of the planning consent for the development. Condition 14, which is split into 14a and 14b is as follows:

- a) *Prior to any above ground works, a scheme shall be submitted to acoustically insulate and limit the breakout of noise in accordance with the Acoustic Design Report prepared by Tetra Tech dated 24 June 2022 received by the City Council as local planning authority on 23 September 2022. The scheme shall then be implemented in full before the use commences.*
- b) *Upon completion of the development and before the use hereby approved becomes operational, a verification report shall be undertaken to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that above criteria is met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the noise criteria. This report shall be submitted to and approved in writing by the City Council as local planning authority before the use becomes operational along with a timescale that confirms when any necessary changes will be implemented.*

Section 5.2 of the Tetra Tech acoustic design report referenced in Condition 14 addresses internal music noise break-out from the building. Tetra Tech concluded that noise break-out from the building would not be significant providing the building envelope (inclusive of the Practice Pods) achieved a minimum composite airborne sound reduction from inside to outside of 39 dB R_w .

Our measurements have therefore been carried out in order to establish whether this level of sound insulation has been achieved. It is noted that the R_w metric actually refers to a laboratory test result and not the on-site, in-situ sound insulation. Nevertheless, our assessment has been based upon determining the relevant R_w performance standard achieved on-site which is denoted R'_w .

Site Visit & Noise Measurements

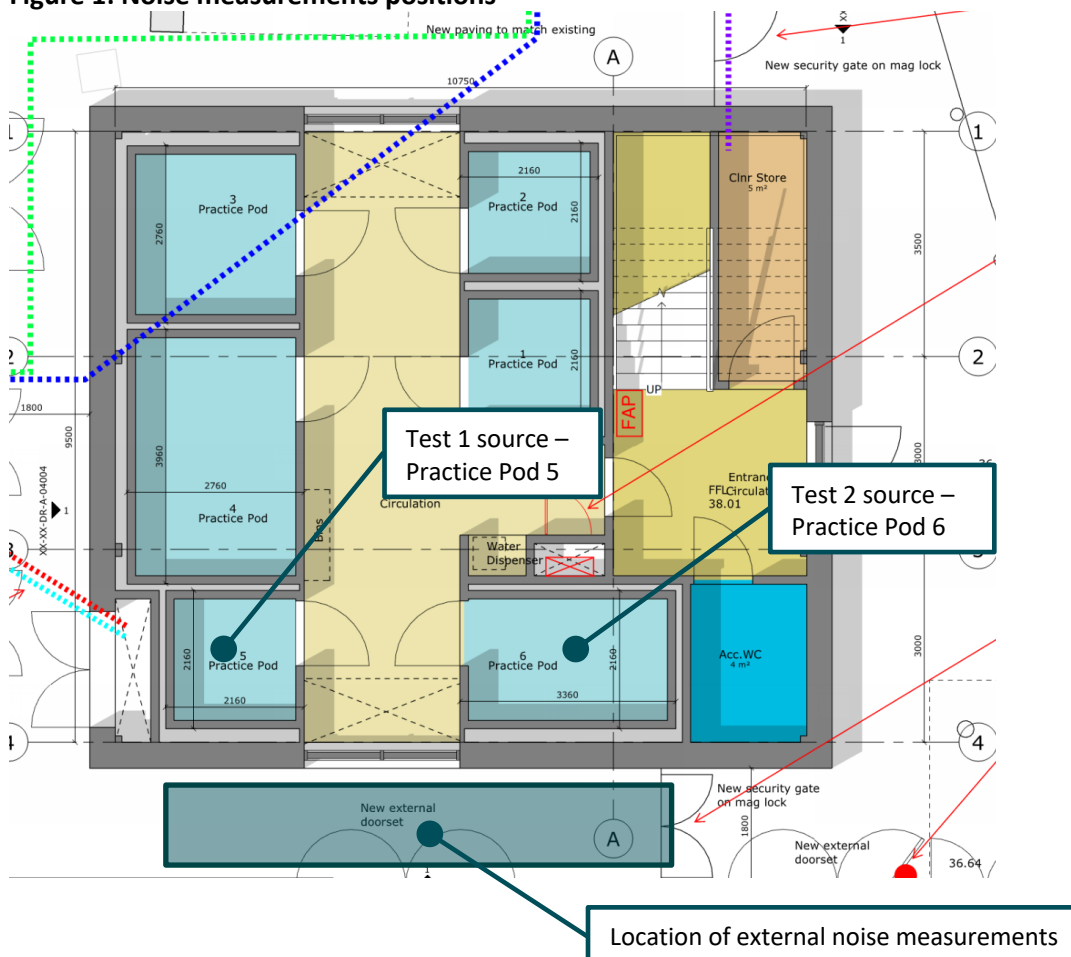
Hepworth Acoustics visited the site during the early morning of Friday 1 December 2023 to carry out a series of noise measurements to establish the airborne sound insulation of the building. The measurements were taken in the early morning (between 06:30 and 07:30) so as to minimise the influence of extraneous noise.

Very high levels of pink noise (i.e. between 95 – 100 dB L_{Aeq}) were generated within a music practice pod using an amplifier/loudspeaker combo. The source noise levels were measured inside the pod and the resulting levels of noise break-out measured adjacent to the pod immediately outside the building. Residual noise levels (in the absence of the pink noise source) were also measured outside the building so that the measurements of noise break-out could be corrected for extraneous noise.

The noise measurements were carried out using a B&K 2250 'Class 1' sound analyser (serial no. 3011706) as a series of multiple short-term periods at each location. The sound analyser was check-calibrated before and after the measurements with no variance observed. The weather conditions during the measurements were dry, overcast, calm and cold.

Two separate sets of measurements were taken with the source in two separate music pods. Practice pods 5 and 6 as indicated in the below figure were chosen as these were on the side of the building away from the main sources of extraneous noise in the vicinity. The external noise measurements were taken in terms of spatially averaged values 1m from the building façade in the vicinity of the relevant pod in the gap between the practice building and the main Martin Harris Centre building.

Figure 1: Noise measurements positions



Results

Based upon the measured noise levels, the calculated sound level difference values for tests 1 and 2 (i.e. for Practice Pods 5 and 6) are as follows:

Table 1: Measured/calculated sound level difference values (D in dB)

Test	Octave band centre frequency (Hz)						D_w
	125	250	500	1k	2k	4k	
1. Sound source in Practice Pod 5	44	43	59	59	57	65	56
2. Sound source in Practice Pod 6	36	42	62	64	58	58	54

The measured/calculated level differences are therefore 54 – 56 dB D_w . Including a nominal 6 dB correction to account for the change from a reverberant internal noise level to an essentially free-field external noise level, the corresponding sound reduction indices are therefore equivalent to 48 – 50 dB R'_w .

We therefore conclude that the noise measurements have demonstrated that the building envelope sound insulation meets/exceeds the relevant minimum requirements from the Tetra Tech acoustic design report and so the requirements of planning condition 14b have been achieved.