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Abraham Moss Community School – Pre-completion Testing

Further to AEC's testing undertaken on Thursday 03 October 2024, the results are presented below compared to the required performance standards identified in the Department for Education and Education Funding Agency's Building Bulletin 93 '*Acoustic design of schools – performance standards*' (Feb 2015).

In addition to the internal measurements, external mechanical plant verification measurements have been undertaken and the measured noise levels compared to Manchester City Council's normal requirements.

1.0 AIRBORNE SOUND INSULATION

Measurements were undertaken in general accordance with ISO 16283-1:2014 Acoustics — '*Field measurement of sound insulation in buildings and of building elements Part 1: Airborne sound insulation*'.

The measured sound insulation performances of the walls between different areas are presented in Table 1, below, compared to the required values.

Table 1 – Measured Sound Insulation Performance Compared to Requirements

Source Room	Receive Room	Sound Insulation dB D _{nT,w} (T _{mf} max)		Requirements Achieved?
		Measured	Required	
GT05 Classroom	GT04 Classroom	61	45	Yes
GT04 Classroom	GT03 Classroom	47	45	Yes
GT02 Classroom	GT01 Classroom	48	45	Yes

2.0 REVERBERATION TIMES

Reverberation time (RT) measurements were undertaken in line with methodology in BS EN ISO 3382-2: 2008 '*Acoustics – Measurement of room acoustic parameters – Part 2: Reverberation time in ordinary rooms*'.

The measured RT compared to the required performance is presented in Table 2, below.

The results demonstrate that the requirements for BB93 have been achieved in all instances.

Table 2 – Measured RTs Compared to the Required Values

Room	RT, s (T _{mf} 125Hz to 4kHz)		Requirements Achieved?
	Measured	Required	
GT01 Classroom	0.7	0.8	Yes
GT02 Classroom	0.8	0.8	Yes*
GT03 Classroom	0.7	0.8	Yes
GT04 Classroom	0.5	0.8	Yes
GT05 Classroom	0.7	0.8	Yes

***Within reasonable tolerance.**

3.0 INDOOR AMBIENT NOISE LEVELS

All measurements of indoor ambient noise levels (IANL)s were undertaken in line with the Association of Noise Consultants (ANC) guidance for noise measurements in buildings. All measurements were undertaken with plant running at full duty and with windows open. As such, with windows closed the noise levels would be lower.

The measured noise levels are presented in Table 3 below, compared to the required values.

Table 2 – Measured IANLs Compared to Required

Roomd	IANL, dBL _{Aeq,30min}		Requirements Achieved?
	Measured	Required	
GT01 Classroom	34	35	Yes
GT02 Classroom	34	35	Yes
GT03 Classroom	33	35	Yes
GT04 Classroom	33	35	Yes
GT05 Classroom	31	35	Yes

4.0 EXTERNAL PLANT NOISE

Plant Location and Details

The new plant consists of 4 no. air source heat pumps located adjacent to the north façade of the building as identified on the following Figure 4.1.

The nearest noise sensitive receivers to the external plant items are residential properties to the north and northwest as identified on Figure 4.1. The distance between the external plant area and the nearest residential receiver is approximately 95 meters.

Figure 4.1 – External Mechanical Plant Location



Background Noise Levels

Daytime background noise levels were recorded at the nearest receptor location with all plant associated with the project switched off. The background noise at the receptor is due to road traffic noise on Crescent Road and the surrounding road networks, with the quietest sampled period measuring at 45dBL_{A90,15min}.

Plant Noise Levels

Noise measurements of external plant items were undertaken with all plant operational and running at full duty.

The ambient noise level at 1m from the external plant location with all units running at full duty was measured at 54dBL_{Aeq}, although this level is affected by ambient noise in the vicinity such as road traffic on Crescent Road.

Noise level measurements were also undertaken at Crescent Road with the plant operational. The plant was completely inaudible and the measured noise levels were no greater than the background noise level indicated above.

Criteria

With respect to noise break out from mechanical services plant, Manchester City Council's (MCC's) Planning & Noise Technical Guidance (P&NTG) states that '*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 (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location*'.

Based on a background noise level of 45dBL_{A90,15min} the noise rating level for mechanical plant should be controlled to no greater than 40dB(A) at the most affected residential receiver.

Assessment

As identified above, the measured noise levels at the properties on Crescent Road were the same with and without the plant running. As such, the plant noise levels are at least 10dB below the background noise levels.

Furthermore, a plant noise level of 54dB(A) as measured at 1m from the plant would result in a noise level of no greater than 15dB(A) at the residential properties on Crescent Road. Increased distance attenuation, which demonstrates that the plant noise is approximately 30dB below the measured background noise level and, as such complies with MCC's requirements.

I trust the above is clear and of assistance.

Yours sincerely



Liam Harrison

Checked by: AGB