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Moss Side Leisure Centre

Plant noise egress assessment

This memo provides comments on noise egress from new items of building services plant and provides and assessment in line with POL05 of BREEAM 2014 – Refurbishment and Fit-out.

Plant noise limits

POL05 applicable credit

One credit is available under BREEAM POL05, an image of the relevant section is provided in Figure 1.

One credit

1. Where there are, or will be, no noise-sensitive areas or buildings within 800m radius of the assessed site.

OR

2. Alternatively, where the building does have noise-sensitive areas or buildings within 800m radius of the site, one credit can be awarded as follows:
   a. Where a noise impact assessment in compliance with BS 7445[1] has been carried out and the following noise levels measured/determined:
      i. Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background conditions can be argued to be similar.
      ii. The rating noise level resulting from the new noise source (see CN7).
3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body (see Relevant definitions in the Additional information section).
4. The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, is a difference no greater than +5dB during the day (07:00 to 23:00) and +3dB at night (23:00 to 07:00) compared to the background noise level.
5. Where the noise source(s) from the proposed site/building is greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with criterion 4.

Figure 1 POL05 credit requirements (source BREEAM UK Refurbishment and Fit-out 2014 SD216 1.0)

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Local Authority criteria

Manchester City Council (MCC) provides guidance in relation to plant noise emissions in *Planning and Noise Technical Guidance* (December 2015), which states the following in relation to plant noise egress:

'The development should be designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.'

Corrections for tonal or attention catching characteristics would need to be applied to the rating level in accordance with BS4142: 2014.

Background noise levels

An environmental noise survey has been conducted at the site. The following section describes that survey and assesses noise levels experienced by the nearby noise sensitive receptors.

Site description

The site location in relation to its surroundings is shown in Figure 2, highlighted green in the centre of the image. The leisure centre consists of a swimming pool, two main halls and other sports and fitness facilities over three levels. The site is accessed via Hulme High Street to the west.

The busiest street in the surround area is Princess Road to the east. Less significant roads include Moss Lane East to the south and Hulme High Street to the west. Radnor Street and Denhill Road are used for access and are located to the east and south respectively.

The unattended monitoring position is highlighted in Figure 2 with the label 'L'.

The location of the proposed plant items is indicated in Figure 2 with the label 'P'.

Adjacent premises

The area is mixed commercial, residential, industrial and retail. Commercial and retail premises consist of Hulme Market Hall and Argos to the north, Asda Superstore to the north-east, and commercial units directly to the south east. These are highlighted yellow in Figure 2.

Approximately 175 m to the west is the Heineken Brewery which is understood to operate 24 hours a day. This is highlighted red in Figure 2.

Approximately 35 m to the west of the leisure centre are residential flats which are highlighted in blue in Figure 2. These are generally four storeys high with retail units at ground floor level. The residential units are considered the nearest noise sensitive premises to the leisure centre.



Figure 2 Site map (courtesy of Google Earth Pro)

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Method

Unattended noise monitoring was undertaken at the site over 5 days to determine the existing background sound levels in the vicinity of nearby noise sensitive premises.

The unattended measurements were performed over 15 minute periods between 14:03 on 27 April 2017 and 15:48 on 2 May 2017. The equipment was installed and collected by Ben Phillips.

The measurement position used during the survey is indicated in Figure 2, denoted by the letter 'L'. A photograph showing the measurement location is provided Figure 3. This location was chosen to be reasonably representative of the noise levels experienced by the nearest noise sensitive premises.

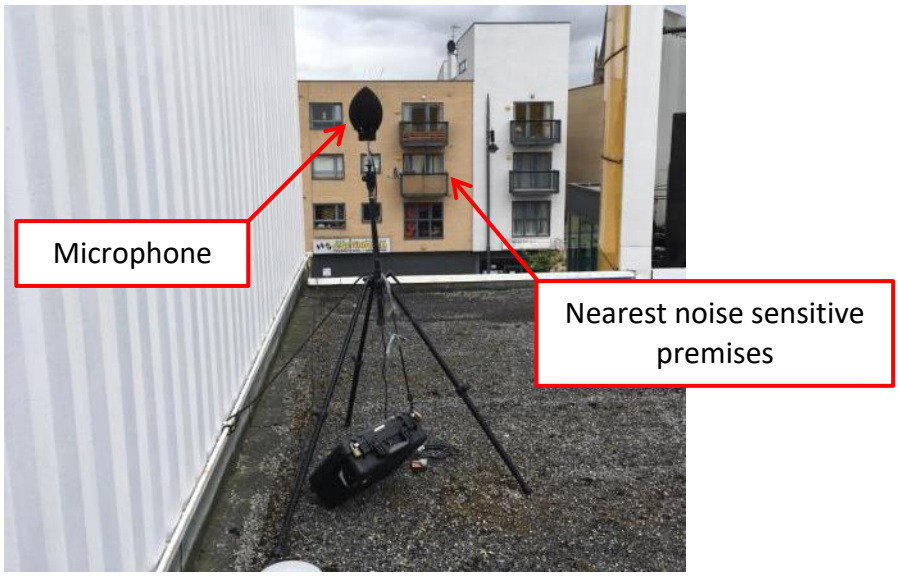

Figure 3 Photograph showing unattended measurement position

The microphone was approximately 1.5m above the local roof height which itself was approximately 6 m above ground level and 1 m from the facade of the adjacent sports hall.

Calibration information for the equipment used can be found in Appendix A.

Results

In line with BS 4142:2014, for the purpose of analysis and establishing representative background sound levels, day and night time typical levels have been quantified using statistical analysis from the continuous logging measurements.

Daytime and night time statistical analysis of representative values for the site are given in Figure 4 and Figure 5.

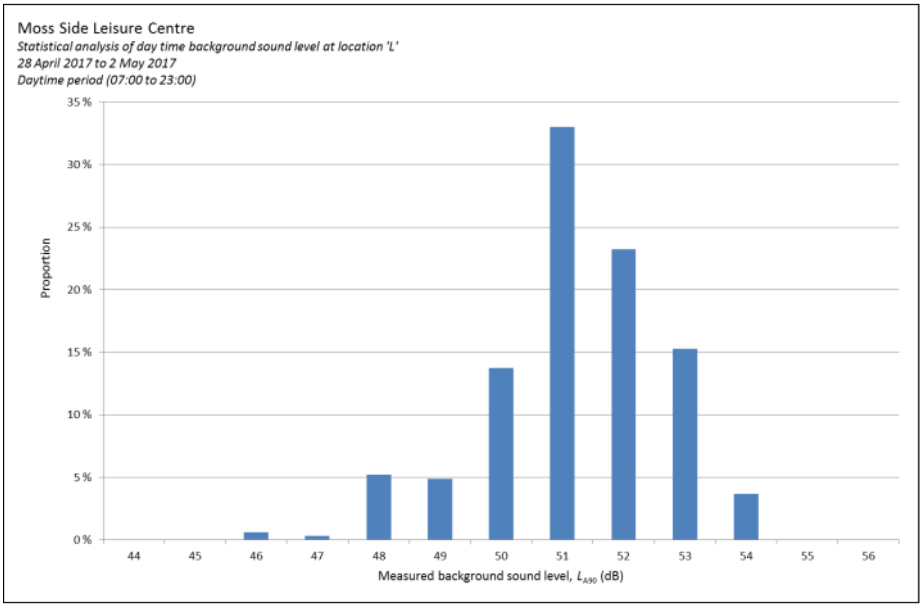

Figure 4 Statistical analysis of daytime background sound levels

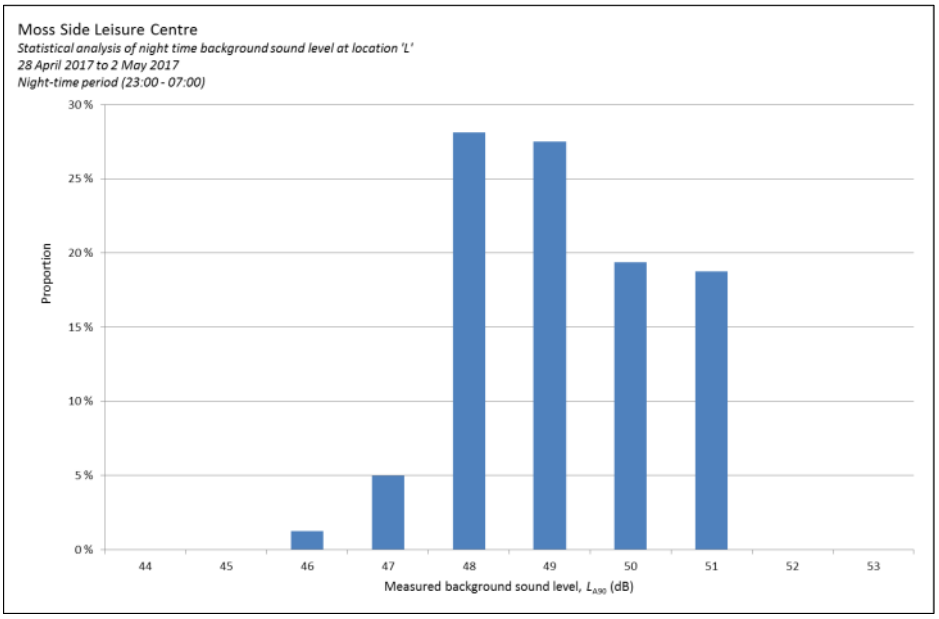

Figure 5 Statistical analysis of night time background sound levels

From this analysis, the representative background sound levels measured during the survey were $L_{A90,15min}$ 51 dB during the daytime and $L_{A90,15min}$ 48 dB at night.

Limits

Based on the above criteria and the measurement results, the cumulative noise level resulting from the operation of all new plant at 1 m from the most affected windows of the nearest noise sensitive premises should not exceed the limits in Table 1. These limits are in line with the requirements of MCC and BREEAM POL05.

Table 1 Plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound pressure level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)
Daytime (07:00-23:00)	46
Night-time (23:00-07:00)	43

Assessment

Plant items

There are four condenser type units located within a plant deck to the west of the development site. Table 2 summarises the external plant items and gives the octave band sound pressure levels for each unit at 1m. Noise data has been obtained from manufacturer's literature.

Table 2 External plant sound pressure level data, measured at 1m

	Octave-band centre frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Samsung R-AM280MXVGNR, L_{eq} (dB) at 1 m	73	70	67	65	62	55	48	37
Samsung R-AM240MXVGNR, L_{eq} (dB) at 1 m	73	70	67	65	62	55	48	37

Assessment

An assessment has been made to predict the noise level from the simultaneous operation of all the external plant items. Calculations have taken into account the distance from the units to the noise sensitive receptors, reflections, and any screening provided by the massing of the Leisure centre. Calculations have been performed in general accordance of BS7445 Part 2 (1991) following the prediction methods in ISO 9316 Part 2 (1996).

Based on the information above, the sound pressure level from all items of building services plant running simultaneously predicted at the most affected residential receptor is L_{Aeq} 38 dB. This meets the Local Authority and BREEAM POL05 plant noise limits in the day and at night.

Suitably qualified person

BREEAM 2014 requires that the assessments be carried out by a suitably qualified acoustic consultant (SQA).

Sandy Brown Associates are members of the Association of Noise Consultants, and are registered to conduct sound insulation tests under their registration scheme. All members of technical staff have membership of the Institute of Acoustics at the relevant grade.

Qualifications for the main staff involved in this project are:

- Ben Phillips, Acoustic Engineer — BEng, AMIOA (3 years continuous experience)
- Mark Howarth, Partner — BSc, MIOA (24 years continuous experience)

Appendix A

Calibration information

A Rion NL-52 sound level meter was used to undertake the unattended noise measurements. The calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/00932326	Rion	15 Mar 19	TCRT17/1087
Microphone	UC-59/05549	Rion	15 Mar 19	TCRT17/1087
Pre-amp	NH-25/32354	Rion	15 Mar 19	TCRT17/1087
Calibrator	NC-74/34125432	Rion	15 Mar 19	TCRT17/1085

Calibration of the sound level meter used for the measurements is traceable to national standards. The calibration certificates for the sound level meter used in this survey are available upon request.

The sound level meters and microphones were calibrated at the beginning and end of the measurements using their respective sound level calibrators. No significant deviation in calibration occurred.