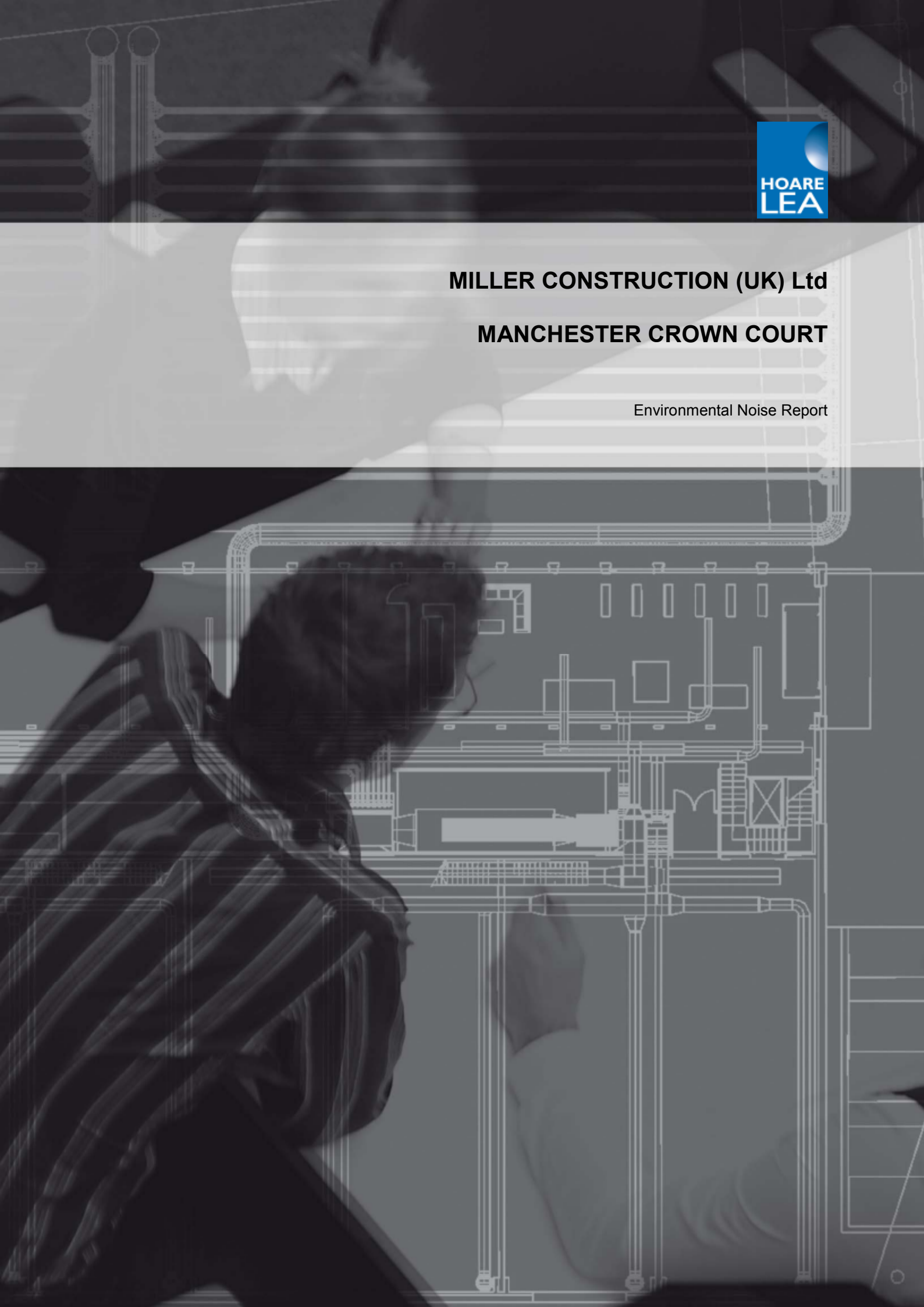

MILLER CONSTRUCTION (UK) Ltd

MANCHESTER CROWN COURT

Environmental Noise Report

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Audit Sheet

Revision	Description	Date	Issued by	Reviewed by
0	Draft	14/01/2014	SM	MM

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1.0 KEY POINT SUMMARY

- As part of refurbishment plans, new mechanical plant is to be installed on the top of the existing roof construction of Manchester Crown Court.
- Noise from mechanical plants is to be controlled to reduce risks of noise complaints.
- Based on the relevant Standards and Manchester City Council requirements, noise from MEP services are to not exceed L_{A90} 47dB daytime (07:00 – 23:00) and L_{A90} 40dB during night time (23:00-07:00) at 1m from the nearest residential properties.

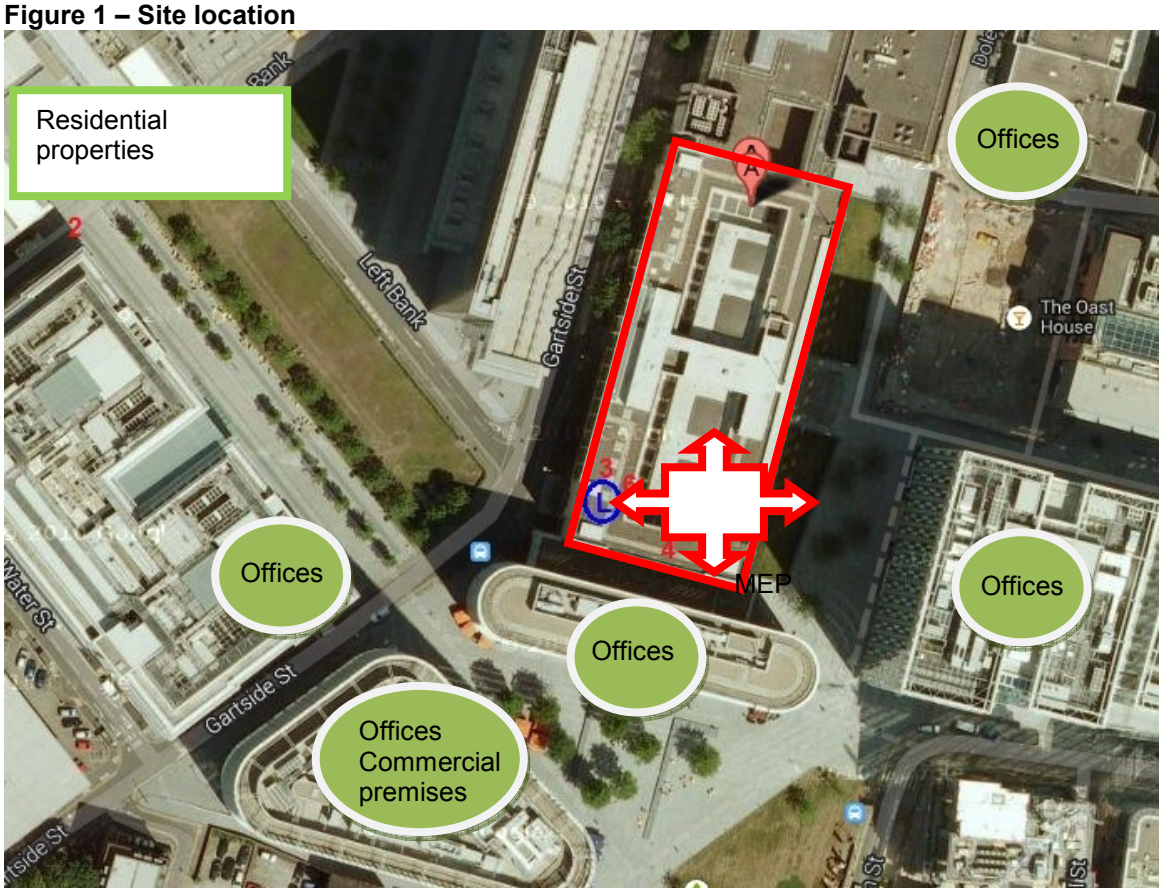
2.0 INTRODUCTION

This report sets out noise emission limits associated with MEP services for the proposed Court refurbishment, in line with Manchester City Council requirements and based on the findings of an environmental noise survey, undertaken in order to establish baseline levels of ambient noise.

3.0 SITE DESCRIPTION

Manchester Crown Court building is located in the centre of Manchester, directly surrounded by office buildings, and residential buildings further

Figure 1 – Site location



4.0 MANCHESTER CITY COUNCIL CRITERIA

To minimise the impact of the new MEP plant noise emission and to prevent a general increase in pre-existing background noise levels around the site, Manchester City Council requires that *"Externally mounted ancillary plant, equipment and servicing shall be acoustically treated in accordance with a scheme designed so as to achieve a noise level of 5dB below the existing background (L_{A90}) in each octave band at the nearest noise sensitive location.*

BS4142:1997- 'Method of rating industrial noise affecting mixed residential and industrial areas' is the only standard for assessing the likelihood of noise complaints resulting from the operation of industrial or commercial noise sources. It is therefore proposed to use this standard in this assessment.

5.0 BASELINE NOISE SURVEYS

A noise survey of local background noise conditions was undertaken on Thursday 9th and Friday 10th January 2014.

A fixed-term noise monitor was installed on the roof of Manchester Crown Court to establish the minimum background noise levels during daytime and during night time. Spot measurements were carried out around the site during daytime to check that the background noise levels did not differ from the data obtained at the fixed term measurement position.

The site is subject to background noise levels varying from L_{90} 51dB(A) during night-time periods to a maximum L_{90} 56dB (A) during the daytime and are controlled by distant road traffic, pedestrian activity and noise from existing mechanical plant located on roofs of nearby buildings. These levels are considered to be typical for a city-centre environment.

6.0 EXTERNAL NOISE CRITERIA

The lowest measured daytime L_{90} value during the measurement period was 52dB(A). The lowest measured night-time value was L_{90} 45dB(A).

Based on Manchester City Council requirements, the proposed combined MEP building services noise limits are as set out below.

Table 1: Noise Criteria For MEP Building Services

Start Time	Duration	Octave Band Noise Limit dB L_{eq}							
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Daytime	1hour	49	48	48	46	43	34	23	**47**
Night-Time	5 minutes	47	45	41	37	35	29	21	**40**

These values apply to the cumulative levels of noise from all items of plant and equipment that serve the proposed redevelopment. If noise from the new plant contains tones, or distinctive impulses or bangs, the limit shall be reduced by a further 5dB. The noise limit shall apply at the nearest existing residential window.

APPENDIX A – ACOUSTIC TERMINOLOGY

Decibel (dB)

The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Octave and Third Octave Bands

The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example third octave bands would be 160 Hz, 250 Hz, and 315 Hz for the same 250 Hz octave band.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to mimic the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies. An 'A' weighted value would be written as dB(A).

$L_{90,T}$

The $L_{90,T}$ is a parameter defined as the sound pressure level exceeded for 90% of the measurement period 'T'. It is a statistical parameter and cannot be directly combined to other acoustic parameters. Typically the $L_{90,T}$ will be an 'A' weighted noise level in dB(A). It is generally used to describe the prevailing background noise level or underlying noise level.

APPENDIX B– EQUIPMENT DETAILS

Item	Description	Serial Number	Calibration Date
Data Logger	Svantek – SVAN 969 Sound Level Meter GRAS - 40AE Microphone Svantek - SV 12 Pre-amplifier	9749 49372 5916	11/11/2013
Hand-held Sound Level Meter	Rion NA-28 Sound Level Meter Rion UC-59 Microphone Rion NH-23 Pre-amplifier	01260199 04074 60102	24/05/2013