

DDN-AC-10

DATE:	02 August 2022	CONFIDENTIALITY:	Public
SUBJECT:	Condition 6 - Fixed Plant Noise Emissions (Response to EHO)		
PROJECT:	Spa @ KSTH	AUTHOR:	Jamie Murray
CHECKED:	Mark Hinds	APPROVED:	Mark Hinds

INTRODUCTION

Overview

A new gym/spa development at 2-4 Booth Street, Manchester has been granted planning permission (ref. 127325/FO/2020) by Manchester City Council (MCC), subject to conditions. Condition 6 relates to fixed plant noise emissions and is repeated below, for reference:

"6) Externally mounted ancillary plant, equipment, servicing and louvres 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.

The scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The approved scheme shall be completed before the premises is occupied.

Upon completion of the development a verification report will be required 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 the noise criteria has been 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 agreed noise criteria."

A design note (ref. DDN-AC-07) presenting an assessment of fixed plant noise emissions (as installed) to discharge Condition 6 was issued to MCC and shall be read in conjunction with this note for all relevant site context.

While the conclusions were generally accepted, the Environmental Health Officer (EHO) has raised a question in relation to the noise output from three louvres that were proposed as part of the redevelopment, repeated below for reference:

"I am still just a little concerned regarding noise from the louvres. The response states that the louvres are to allow "combustion air and heat rejection from the hot water plant area by natural means". Surely this rejection must be by some form of forced means or by a fan? Any air pushing over the blades of the fan or air passing through the louvres at speed will create some noise? Is the rejected air being emitted at force or mechanical assistance? Maybe the agent could give some more information regarding this air rejection and a more detailed description and can this be added to the validation testing scheme?"

No noisy equipment was shown to be served by these louvres as part of the Mechanical, Electrical & Plumbing (MEP) design and they were, therefore, discounted from the detailed assessment of noise emissions. This note has been prepared in response to the EHO question relating to noise from the louvres and it includes the results of a site investigation to establish the noise output (if any) from the louvres.

PROJECT PROPOSALS

The design included the 3no louvres, which are highlighted below (L1 - L3).

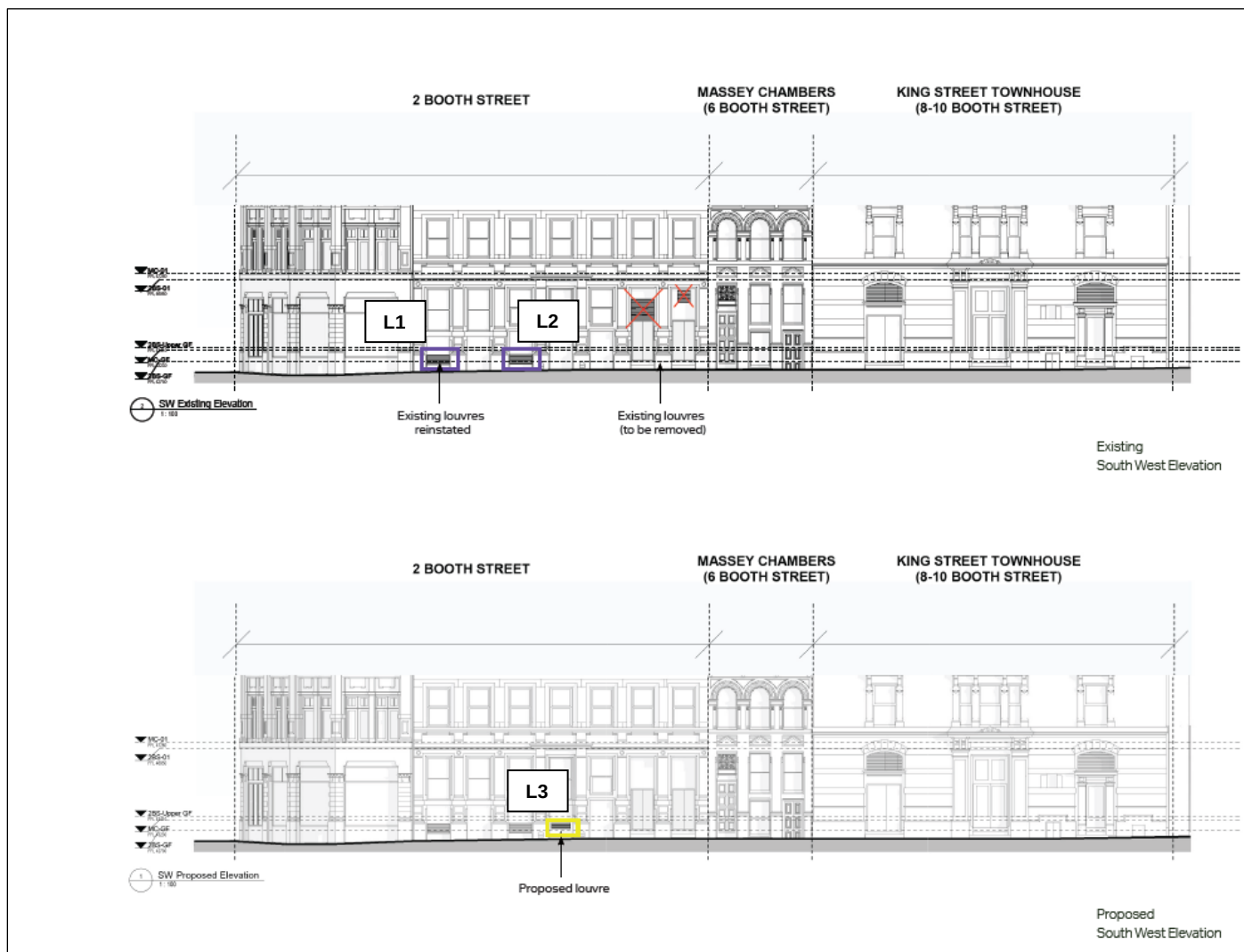


Figure 1 - Proposed louvres

SITE INVESTIGATION

Observations

Jamie Murray (Principal Engineer, MIOA) attended site on Friday 22 July 2022 from 10:00 hours to 11:00 hours.

Of the 3no proposed louvres, only louvre L1 (1,150 mm x 550 mm) had been installed. There were no openings where louvre L2 had been proposed and louvre L3 had been replaced with 2no sump pump drainage pipes which do not produce any noise output.

See below for a photograph captured on site, demonstrating the above.

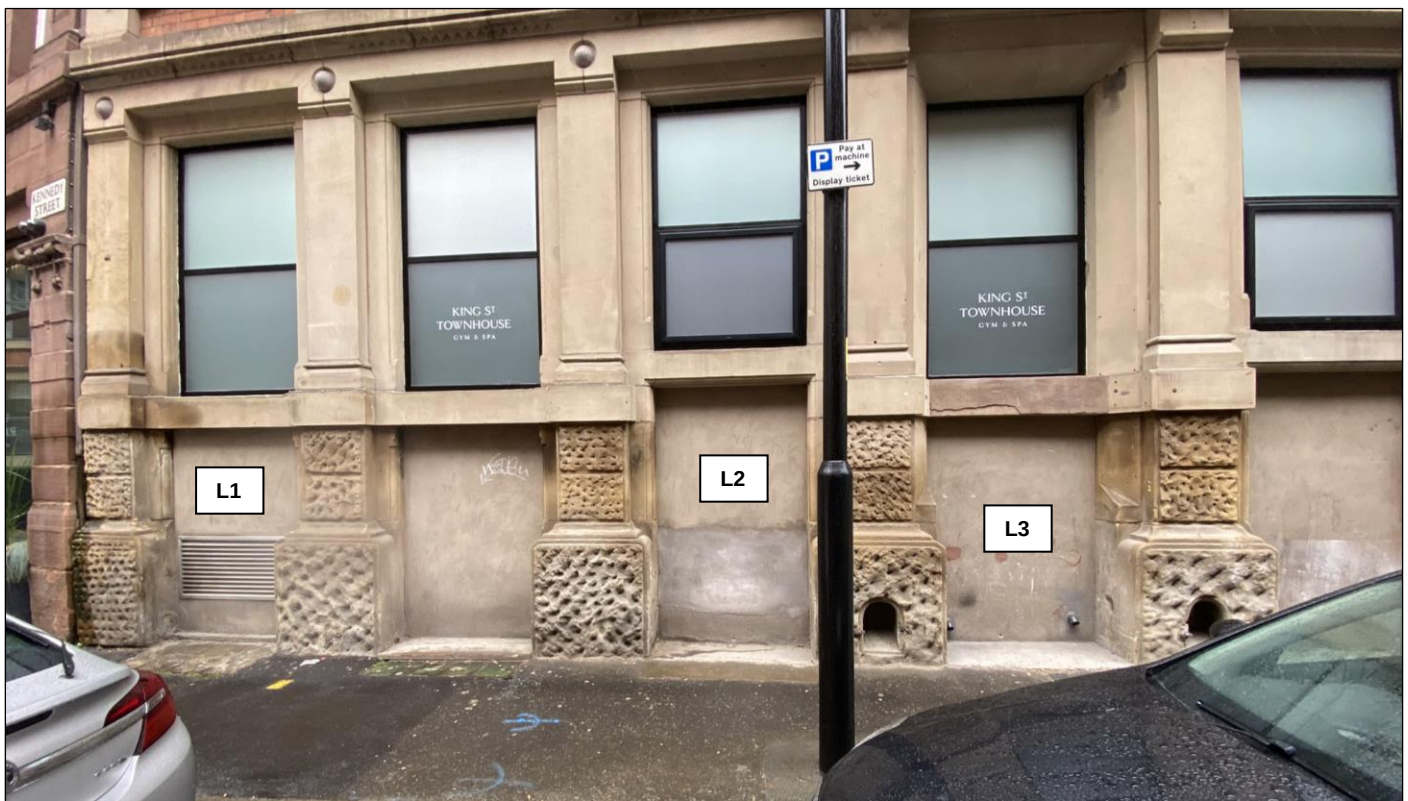


Figure 2 - Openings as installed

Noise emissions from louvre L1 were very low and only just subjectively audible when within approximately 1 m of the louvre, the noise was noted to be steady and continuous. It was deemed appropriate to obtain measurements at 0.5 m from the louvre to enable subsequent assessment against the plant noise emissions criteria.

Measurement Results

Measurements were undertaken at 0.5 m from the louvre and at a nearby location in the absence of noise contribution from the louvre to enable a comparison against the residual noise level.

All measurements were made using type 1 sound monitoring equipment. All equipment was within calibration at the time of the undertaking of the measurements.

The results of the measurements are presented below, note that for building services it is typical to consider the $L_{A90,T}$ to be representative of the $L_{Aeq,T}$.

Table 1 – Measured noise levels

Measurement	Measured Sound Level
Source Sound Level – 0.5 m from source	53.4 dB $L_{A90,30s}$
Residual Sound Level – In absence of source	52.8 dB $L_{A90,30s}$

As can be seen above, the sound level at 0.5 m from the louvre is only just above the residual level in the absence of noise contribution from the louvre, it is therefore not possible to apply a reliable correction based on the difference between the source sound level and the residual sound level. Not applying a correction shall also enable a pessimistic assessment.

FIXED PLANT NOISE EMISSIONS ASSESSMENT

Criteria

Plant noise emissions criteria at the nearest residential receptors were agreed as part of the planning approval process and are repeated below for reference.

Table 2 – Fixed plant noise emissions criteria

Period	Plant Noise Emission Limit
Daytime (07:00 – 23:00 hrs)	48 dB $L_{Ar,1h}$
Night-time (23:00 – 07:00 hrs)	47 dB $L_{Ar,15min}$

Assessment Parameters

The nearest residential receptors that were considered previously are as follows:

- **Receptor A** – Windows of residential properties within 2-4 Booth Street
- **Receptor B** – Guest room windows of the King Street Townhouse Hotel
- **Receptor C** – Windows of residential properties on Kennedy Street

The results of the assessment undertaken previously are presented below.

Table 3 – Results of previous assessment

Description	Sound Pressure Level (dB) at Receptor		
	Receptor A	Receptor B	Receptor C
Rating Level ($L_{Ar,15min}$)	43	46	41
Limit ($L_{Ar,15min}$)	47	47	47



Assessment

As required by MCC, plant noise has been assessed at the nearest noise sensitive receptors taking into consideration distance losses from the louvre L1. The cumulative contribution from all other plant items is included in the table below along with the plant noise limits for comparison.

Table 4 – Fixed plant noise assessment

Description	Sound Pressure Level (dB)		
	Receptor A	Receptor B	Receptor C
Louvre L1 (SPL @ 0.5 m)	53	53	53
Distance Correction	-22 (6 m)	-30 (16 m)	-24 (8 m)
Louvre L1 (SPL @ Receptor)	31	23	29
Results of Previous Assessment	43	46	41
Cumulative Specific Noise Level	43	46	41
Acoustic Feature Correction	+0	+0	+0
Rating Level	43	46	41
Limit	47	47	47
Compliance	✓	✓	✓

The assessment of fixed plant items (as installed) above indicates compliance with the plant noise emission limits required by MCC under normal operation.

I trust the above is clear. If you have any further queries, please do not hesitate to contact me.

Yours sincerely

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