

Client: Chapman Ventilation Limited
Project: Franco Manca, King Street, Manchester
Reference: 220114-R002
Report date: July 7, 2022
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1. INTRODUCTION

New mechanical services plant and equipment has been installed at Franco Manca, 37-43 King Street, Manchester, during the refurbishment to form a new restaurant.

ACA Acoustics Limited has been commissioned by Chapman Ventilation Limited to carry out a sound level survey of the equipment to confirm it meets the Local Authority planning requirements.

This report contains results of the sound level survey and analysis of the measured levels.

The assessment and report have been prepared by Rob Cant, a director of ACA Acoustics Limited and a Corporate Member of the Institute of Acoustics. Mr Cant holds the Institute of Acoustics' post-graduate Diploma in Acoustics and Noise Control, has over 20 years' experience of working within the acoustics industry, and is considered a suitably qualified acoustician to undertake the assessment.

2. ACOUSTIC CRITERIA

Condition 4 of Manchester City Council's Decision Notice reference 131941/FO/2021 relates to noise from the new plant and requires that,

"Prior to occupation of the development a verification report will be required to validate that the work undertaken throughout the development (including any external plant equipment) conforms to the recommendations and requirements in the approved acoustic consultant's report (Report Reference 220114-R001A dated 08/02/2022). The report shall also undertake post completion testing to confirm that acceptable criteria have 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."

ACA Acoustics' report 220114-R001A, referenced in the condition, recommended noise from the new mechanical services equipment should not exceed a level of **L_{Ar} 46dB** to outside the closest noise-sensitive properties, when assessed in accordance with BS 4142:2014+A1:2019.

3. SOUND LEVEL SURVEY & ASSESSMENT

Air conditioning condensers have been installed within a plant compound at roof level. Supply and extract fans have been installed internally, ducted to intake/exhaust via louvres to the rear façade.

A sound level survey was undertaken during the evening of the 29th June 2022, between 21:00 and 22:30 hours, by Rob Cant of ACA Acoustics Limited.

Background sound levels during the survey were significantly higher than those previously recorded by Clement Acoustics and used in ACA Acoustics' previous report. It was therefore considered appropriate to measure sound levels from the new plant at positions closer to the equipment/louvre, allowing the specific sound level from the equipment to be determined. These have then been corrected back to the closest residential receptors, allowing for the additional distance from the measurement location to the windows.

Sound levels were recorded in continuous 5-minute samples of LAeq and LA90 values along with other statistical indices and octave band spectra. Measurements were undertaken over a period of around one-hour with the plant switched on to obtain the specific sound levels. The plant was then switched off once the restaurant had closed at 22:00 hours and the survey repeated over nominally a 30-minute period to obtain the background sound level.

The survey was conducted typically following procedures set out in BS 4142:2014+A1:2019.

Equipment used during the survey is shown in Table 1 below.

Equipment	Serial Number
Rion Class 1 sound level meter type NL-31	00431030
Svante Class 1 calibrator type SV33B	57595

Table 1: Equipment used during the sound level survey

Weather conditions at the start of the survey were recorded as dry, cloudy and mild, with a temperature of 15°C and a $\leq 1\text{m.s}^{-1}$ south-westerly breeze. Weather conditions are not considered to have adversely impacted the outcome of the assessment.

Summary results of the survey are provided below. Average LAeq sound levels are provided to one decimal place. This does not define the accuracy of the survey, but rather to assist in determining the specific sound level from the residual level.

Description	Notes	Average LAeq	Representative LA90
Roof level measured with condensers operating.	Measured 3m from condensers. Condensers inaudible. VRF condensers serving offices switched off. Dominant source is fan to opposite side of the alleyway.	52.5dB	50dB
Roof level measured with Franco Manca plant switched off.	Measured 3m from condensers. Some third-party plant switched off shortly after the start of the background measurements and subjectively sound levels reduced.	49.5dB	47dB
5m from louvres within alleyway with fans and condensers operating.	Noise from louvres clearly audible. A third-party louvre is also clearly noticeable.	58.3dB	56dB
5m from louvres within alleyway with condensers only operating	Noise from condensers audible along with third-party plant.	57.0dB	55dB
5m from louvres within alleyway with all Franco Manca plant switched off.	Noise from third-party plant audible along with traffic and other ambient sources.	54.0dB	53dB

Table 2: Summary sound level survey results

As noted above, the author considered that noise from the condensers was inaudible at the measurement position, but closer measurements were not possible as there was no handrail around that part of the roof. Third party plant was observed switching off shortly after the residual and background sound level measurements close to the condenser at roof level commenced. This means that the actual residual sound level would have been higher, and the specific sound level of the condensers will be lower than that predicted by ACA Acoustics below. This ensures a very robust assessment.

Assessment of the measured sound levels in accordance with BS 4142:2014+A1:2019 is provided in the tables below.

Description	Roof Level	Relevant Clause	Commentary
Measured ambient sound level	L _{Aeq} 52.5dB	7.3	Sound level measured with condensers operating
Measured residual sound level	L _{Aeq} 49.5dB	7.3	Sound level measured with all switched off
Calculated specific sound level at measurement position	L _{Aeq} 49dB	7.1 7.3.1	
Distance correction from measurement position to receptor location	-15dB	7.3.5	The closest windows are at least 18m from the condenser location. A distance correction of -15dB is applied ($20 \times \log(D2/D1)$).
Specific sound level at the receptor location	L _{Aeq} 34dB	7.1 7.3.5	
Background sound level	L _{A90} 46dB	8.1.3 8.3	Background sound level previously measured at the site by Clement Acoustics.
Acoustic feature correction	0dB	9.2	Noise from the condensers will be inaudible at the receptor location and is of a similar character to the existing acoustic soundscape. No correction is applicable.
Rating level	L _{Ar} ≤34dB	9.2	
Excess of rating level over background sound level	-12dB	11	Assessment indicates negligible likelihood of adverse impact

Table 3: BS 4142:2014+A1:2019 Assessment

Description	Ground Floor Level	Relevant Clause	Commentary
Measured ambient sound level	LAeq 58.3dB	7.3	Sound level measured with all plant operating
Measured residual sound level	LAeq 54.0dB	7.3	Sound level measured with all Franco Manca plant switched off
Calculated specific sound level at measurement position	LAeq 56dB	7.1 7.3.1	
Distance correction from measurement position to receptor location	-13dB	7.3.5	The closest windows are at least 22m from the louvres. A distance correction of -13dB is applied ($20 \times \log(D2/D1)$).
Specific sound level at the receptor location	LAeq 43dB	7.1 7.3.5	
Background sound level	LA90 46dB	8.1.3 8.3	Background sound level previously measured at the site by Clement Acoustics.
Acoustic feature correction	0dB	9.2	Noise from the louvres is of a similar character to the existing acoustic soundscape. No correction is applicable.
Rating level	LAr $\leq$ 43dB	9.2	
Excess of rating level over background sound level	-3dB	11	Assessment indicates negligible likelihood of adverse impact

Table 4: BS 4142:2014+A1:2019 Assessment

Tables 3 and 4 show the cumulative rating level of the installed new equipment does not exceed the representative background LA90 sound level to outside the closest noise-sensitive properties.

In accordance with BS 4142:2014+A1:2019 the assessment indicates a negligible likelihood of adverse impact. Sound emissions from the plant complies with Manchester City Council's planning consent requirements and the author considers that no further mitigation measures are necessary.

It is recommended that condition 4 may be discharged.