

ACOUSTIC SURVEY NOTE

Ref : 14176/001/mb

Date : 28 May 2014



PROJECT : Reco-Air

SUBJECT : Noise Assessment

1.0 Introduction

- 1.1 Applied Acoustic Design have been appointed to measure and report on operational noise levels associated with typical Reco-Air units. The aim is to develop a statement on noise emission that can be included within publicity material.
- 1.2 Noise levels of two operational units were measured at two different Ed's Easy Diner locations; at Watford (size 2.0) on 25th April 2014, and at Milton Keynes (size 1.5) on 16th May 2014.
- 1.3 In addition to unit noise measurement, noise levels were also recorded beneath the kitchen extract hood, for information and future use, if necessary.

2.0 Noise Measurements

2.1 Watford – size 2.0

- 2.1.1 This unit is located within a dedicated plantroom. This makes accurate noise level measurement difficult, due to the confined space and the reverberant room contribution. In addition, it was observed that there was a primary noise breakout contribution from the high level supply and return air ductwork leading from/to the unit – this is only single skin, compared to the double skin unit, and produces more noise. It was not possible within the confines of the measurement space to separate the two elements.
- 2.1.2 The measured room noise levels are therefore affected by both the plantroom reverberant effect, and the contribution from ductwork noise breakout. It is not possible to accurately correct for these issues, although an estimate can be made.
- 2.1.3 The (un-corrected) measured results were as follows;

Item	octave band centre frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
	sound pressure level, dB re 2x10 ⁻⁵ Pa							
AHU, within plantroom	70	69	67	58	57	52	51	63

2.2 Milton Keynes – size 1.5

2.2.1 This unit is located behind a “mobile” diner unit, within a large volume shopping centre area (roofed over external area). There is a 2.0m high Perspex screen around the rear of the diner, which provides an enclosed area for the plant. This means that a true “free-field” noise measurement could not be made. In addition, there was a background noise level contribution due to other sources within the shopping centre, i.e. plant and pedestrian activity noise.

2.2.2 It is possible to accurately correct for the effect of background noise, but a correction for the reverberant effect of the enclosure screen can only be an estimate.

2.2.3 The (un-corrected) measured results were as follows;

Item	octave band centre frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
	sound pressure level, dB re 2x10 ⁻⁵ Pa							
Background noise level	58	56	52	52	49	44	42	54
AHU, Lp at 0.5m	68	69	58	55	52	47	45	57

2.3 Extract Hood Noise Levels

2.3.1 The measured extract hood noise levels (microphone approximately 0.5m from grease filters) were as follows;

Location	octave band centre frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
	sound pressure level, dB re 2x10 ⁻⁵ Pa							
Watford	57	60	63	56	56	50	48	60
Milton Keynes	64	61	59	60	60	56	47	63

3.0 **Assessment – Reco-Air Units**

3.1 Taking account of background noise, room correction and reflection effects, and making an allowance for duct noise breakout, the corrected (estimated) Reco-Air unit noise levels are as follows, referenced to a point 1m from the unit;

Unit	octave band centre frequency (Hz)							dBA at 1m
	63	125	250	500	1k	2k	4k	
	sound pressure level at 1m, dB re 2x10 ⁻⁵ Pa							
Size 2.0 : Watford	66	64	62	51	49	44	43	57
Size 1.5 : Milton Keynes	65	66	54	49	47	42	40	54

3.2 For the reasons noted, these noise levels can only be estimates at this stage. More accurate data would require further testing in a more controlled environment – this could be in the factory, although some care would be needed with the set-up, including provision of attenuated and treated ductwork, size of test space or provision of sound absorptive treatment to avoid acoustic reflections, and ensuring background

noise levels are sufficiently low. Further investigation will be needed to establish if this is possible.

- 3.3 N.B. There is a greater level of uncertainty in the individual octave band noise levels than there is in the overall A-weighted value. At this stage, pending more accurate testing, it is recommended that only A-weighted noise levels are published to third parties.

4.0 Statement For Publicity Material

- 4.1 It is not clear how much technical detail is required to be included in the noise level statement designed for use in publicity material. At this stage, the following simple statement is suggested as a basis for discussion going forward;

Reco-Air unit noise levels are very low. Casing radiated noise from standard units are between 54 to 57 dBA when measured at 1m (free field), depending upon the size of unit and exact configuration.

- 4.2 This statement can be reviewed and more information provided as necessary.

REPORT ENDS