

Acoustic Assessment of Installed Mechanical Services Equipment

13 Cosmo Place, London WC1N 3AP



Client: Master Wei

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0. SUMMARY

- 0.1. Two new air conditioning condensers have been installed to serve an existing property at 13 Cosmo Place, London. The client is preparing a retrospective planning application for the two condensers. ACA Acoustics have been commissioned to carry out an acoustic assessment of the equipment.
- 0.2. The assessment is required to provide evidence that noise emissions from the equipment will not be detrimental to the amenity of nearby noise-sensitive properties and complies with the Local Authority's requirements.
- 0.3. A sound level survey has been carried out of the installed plant during the operating hours, as well as a background survey carried out over a 24-hour period. Observations on site were that the new equipment was inaudible at the residential receptor and has been introduced to an area where the acoustic environment is heavily influenced by existing mechanical equipment noise.
- 0.4. Calculated specific sound levels from the plant to outside the noise-sensitive receptor were below or equal to LAeq 51dB. When assessed in accordance with the requirements of London Borough of Camden and BS 4142:2014+A1:2019, the installed mechanical services equipment is operating at a rating level at least 10dB below the prevailing background sound level.

1. INTRODUCTION

New mechanical equipment, consisting of two air conditioning condensers, has been installed at 13 Cosmo Place, London. ACA Acoustics Limited have been instructed by Leo Song on behalf of the client to carry out an acoustic assessment of the equipment in order to support a retrospective application for planning permission.

This report presents results of the sound level survey and assessment.

2. ACOUSTIC CRITERIA

London Borough of Camden Council's policies relating to noise are set out in Appendix 3 of the Local Plan, which provides detailed noise thresholds to determine the potential acoustic impact of new developments.

In Summary, London Borough of Camden requires an assessment to be carried out in accordance with British Standard 4142:2014+A1:2019.

The scope of BS 4142:2014+A1:2019 advises that *"this British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature ... to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident"*. BS 4142:2014+A1:2019 is commonly used to assess the potential for loss of amenity due to noise from mechanical services equipment and is considered appropriate for this application.

The assessment method of BS 4142:2014+A1:2019 corrects the specific sound level from the source under investigation to account for characteristics that could make the sound more intrusive to obtain a rating level. This rating level is compared against the prevailing background sound level outside the noise-sensitive property. Section 11 of BS 4142:2014+A1:2019 provides a commentary of the assessment result and advises that:

- a) *Typically, the greater this difference [between the rating level and the background sound level], the greater the magnitude of the impact.*
- b) *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) *A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.*
- d) *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant*

adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Rather than use the assessment of the impacts from the Standard, Camden requires that the calculated rating level is compared against noise-related conditions set out in Table C of the Appendix, as shown in Table 1 below:

Existing Noise Sensitive Receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings	Garden used for main amenity (free field) and outside living or dining or bedroom window (façade)	Day	Rating level 10dB below background	Rating level between 9dB below and 5dB above background	Rating level greater than 5dB above background
Dwellings	Outside bedroom window (façade)	Night	Rating level 10dB below background and no events exceeding 57dB LAmax	Rating level between 9dB below and 5dB above background or noise events between 57dB and 88dB LAmax	Rating level greater than 5dB above background and/or events exceeding 88dB LAmax

Table 1: London Borough of Camden Noise Limits

The terms “LOAEL” and “SOAEL” are defined as the “Lowest Observed Adverse Effect Level” and “Significant Observed Adverse Effect Level” in the Planning Practice Guidance – Noise (PPG-N) and Noise Policy Statement for England (NPSE). The NPSE and PPG-N both require that significant adverse impacts are avoided and that where the impact lies somewhere between the LOAEL and SOAEL all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life, whilst considering the guiding principles of sustainable development as set out in the National Planning Policy Framework.

Assessment result criteria shown within Appendix A of Camden’s Local Plan are more stringent than those set out in the British Standard and can therefore be taken to ensure a robust assessment. Compliance with the “Green” criteria or lower half of the “Amber” range will generally ensure no loss of amenity to nearby residents.

In this assessment, a criterion of rating level 10dB below the representative background level will be used where practical.

3. SOUND LEVEL SURVEY

A sound level survey was carried out by Sam Thorpe of ACA Acoustics during the evening of the 20th June 2023. Attended sound levels were recorded to outside the closest residential receptors with the new condensers operating. The microphone was then left to continue over an extended period to the 22nd June 2023. Details of this sound level surveys are provided below.

The following equipment was used during the survey and the sound level meter was calibrated before the survey and checked after with no deviation noted.

Equipment	Serial Number
NTi Audio Class 1 sound level meter type XL2	A2A-06294-E0
Svantek calibrator type SV33B. Compliant to IEC 60942-1:2003	83826

Table 2: Equipment used

Weather conditions at the time of setting up the survey were hot and humid with no wind and dry ground conditions. Weather conditions have been reviewed at www.worldweatheronline.com, using the closest available commercial weather station. Weather conditions remained predominantly calm and dry with wind speeds below recommended limits during the proposed equipment operation times. Meteorological conditions are considered acceptable and will not have adversely impacted the survey results

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

Results of the unattended survey are shown in graphical form in Figure 1. Summary results are included in Table 3.

Description	LAeq	LA90
Equipment powered on	64dBA	63dBA
Equipment powered off *	64dBA	63dBA
Specific Sound Level	$\leq 53\text{dBA}$	

Table 3: Summary sound level survey results

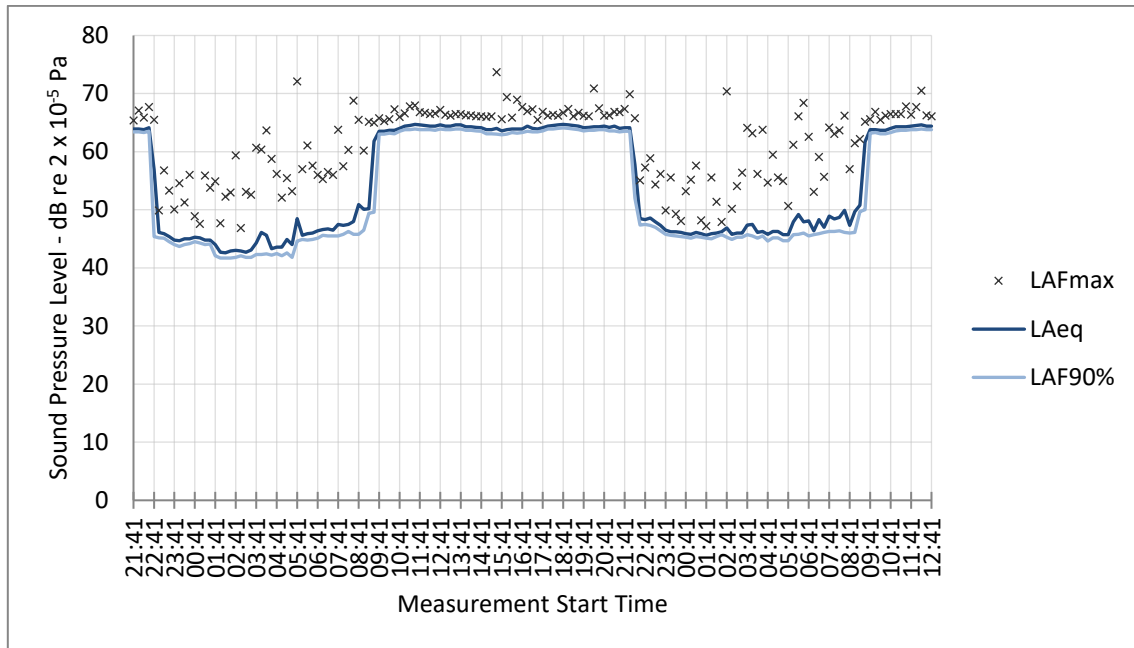


Figure 1: Sound level survey results

The measurement results show the LAeq and LA90 sound levels do not change with the equipment powered both off and on. The condensers will have switched on/off regularly throughout the restaurant trading hours, as required by the load on the system, and there is no change in the measured sound levels over these times. Sound levels at these times are dominated by existing mechanical services equipment in the vicinity. This confirms that the specific level of the new condensers is at least 10dB below the background LA90 during times when the condensers are not operating.

This correlates with the author's subjective opinion on site. Noise from the condensers was completely inaudible at the receptor location above noise from existing plant. The condensers were only slightly audible when listening directly in front of the condenser fan.

Assessment of the rating sound level in accordance with the requirements of BS 4142:2014+A1:2019 is undertaken in Table 4 below.

Description		Relevant Clause	Commentary
Calculated specific sound level to noise-sensitive windows	LAeq 53dB	7.1 7.3.6	Specific sound level with all equipment operating.
Background sound level	LA90 63dB	8.1.3 8.2	Measured background sound level.

Acoustic feature correction	0dB	9.2	The existing acoustic climate comprises of non-associated mechanical equipment, and the new condensers are completely inaudible to the receptor location above noise from existing equipment. As such features from the plant will not be distinguishable, and no acoustic feature correction is applicable.
Rating level	LAr <53dB	9.2	
Excess of rating level over background sound level	-10dB	11	Assessment indicates a low likelihood of adverse impact

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

BS 4142:2014+A1:2019 requires an assessment to consider the context of the development, as well as adhering to numerical values. The proposal involves new mechanical equipment being introduced to an area with other mechanical equipment operating in the vicinity. In this scenario, the change in acoustic character, and subsequent potential for loss of amenity, is lower than if, say, there were no other similar noise sources in the area.

The author considers that the context of the assessment does not alter the initial estimate of the impact, and that sound levels from the new mechanical equipment should not be detrimental to the amenity of any residential occupiers in the vicinity.

4. CONCLUSION

An application is to be submitted for retrospective permission for the installation of two new air conditioning condensers at 13 Cosmo Place, London.

ACA Acoustics have undertaken sound level surveys in the vicinity and assessment of noise from the equipment.

Measured rating sound level from the equipment meets the requirements of London Borough of Camden Council requirements and no noise control treatments will be required.