

Acoustic assessment of proposed mechanical equipment at 60 Christchurch Road, Reading

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0. SUMMARY

- ACA Acoustics Limited have been commissioned to assess the acoustic impact of proposed new mechanical services equipment to be installed at 60 Christchurch Road, Reading.
- 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 requirements of Reading Borough Council. In accordance with criteria issued by Reading Borough Council on other similar projects, it is anticipated that noise from the equipment shall not exceed a level 10dB below the existing background LA90 outside nearby noise-sensitive properties.
- A survey has been carried out at the rear of the site to establish existing background sound levels in the vicinity. Noise-sensitive receptors have been identified as rear windows of flats above commercial properties adjoining the site.
- Lowest background sound levels were measured at LAF90 46dB during the daytime to 23:00 hours and 36dB overnight.
- The design is at an early stage and at the time of issuing this report final equipment selections had not been provided. Maximum permissible cumulative sound levels have been specified for future equipment selections to comply with the requirements of Reading Borough Council. For plant operating during the daytime, cumulative sound levels shall not exceed a level of LAeq 36dB at 1m outside the closest residential windows. For plant operating overnight, maximum permissible levels are set at LAeq 26dB outside residential windows.
- The above criteria are relatively low, and it is recommended that fans should be installed internally within the building with duct-mounted attenuators between the fan and atmospheric terminal. Any plant installed externally must be very low-noise models or may require acoustic screens or enclosures. Once the design has been finalised it is recommended ACA Acoustics Limited review the equipment selections to ensure compliance with Reading Borough Council's acoustic requirements.

1. INTRODUCTION

New mechanical services equipment is to be installed at 60 Christchurch Road, Reading, during the change of use to a café.

ACA Acoustics Limited has been commissioned by the client to carry out a survey of external sound levels in the vicinity and advise maximum permissible sound levels from the proposed mechanical equipment.

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

2. ACOUSTIC CRITERIA

Based on previous developments within the area, it is anticipated that noise levels from new mechanical equipment will need to be controlled to not exceed a criterion of 10dBA below the prevailing background sound level in the vicinity of nearby noise-sensitive properties. At this level noise from the new equipment should not increase the prevailing background sound level and would not be detrimental to the amenity of nearby residents.

The criterion is likely to be applicable over a period of 60 minutes during the daytime and 15 minutes overnight, to correspond with BS 4142:2014 Methods for rating and assessing industrial and commercial sound and is to be measured at a position 1m external to noise sensitive facades (typically outside residential windows).

3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS

The development site is at 60 Christchurch Road, Reading.

A planning application is being prepared for the change of use of the property to a restaurant or café. The change of use will necessitate installation of new mechanical services equipment associated with the new use, typically including a kitchen extract fan and refrigeration condenser.

Indicative layout drawing showing location of the proposed plant, provided by the client, is included in Figure 1 below.

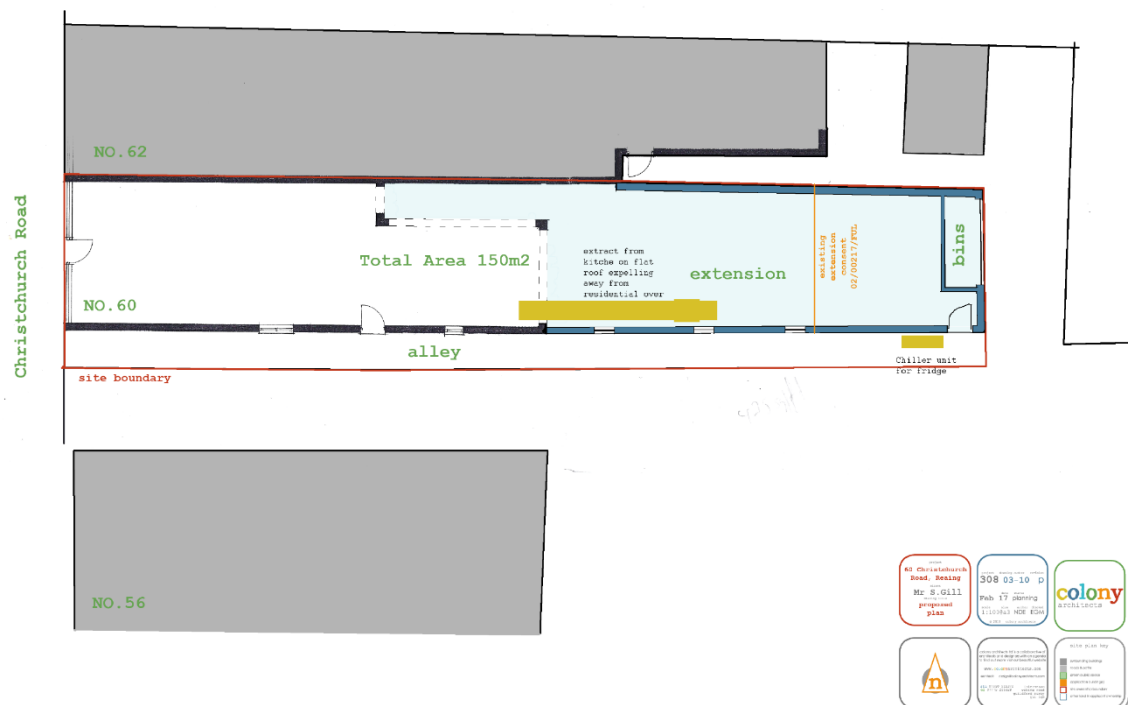


Figure 1: Site layout plan

Closest residential windows to the new equipment have been identified to the rear façade of flats over upper floors above commercial units adjoining the development site on Christchurch Road.

4. SOUND LEVEL SURVEY

To assess sound levels from the new mechanical equipment it is necessary to establish background sound levels in the vicinity. Details of the sound level survey carried out by ACA Acoustics Limited are provided below.

A single measurement position was selected with the microphone extending out of a first-floor window to the rear of the site at a position considered equivalent to the windows of the most-affected noise-sensitive properties adjoining on Christchurch Road.

The unattended survey was carried out between Wednesday 25th and Thursday 26th April 2018. During the survey the weather included dry and calm periods.

The following equipment was used during the survey; the sound level meter was calibrated before and checked after the survey measurements with no change noted:

Equipment	Serial Number
Rion sound level meter type NL-52 Class 1 complete with weatherproof and lockable outdoor environmental kit	00564867
Castle calibrator type 4226. Compliant to IEC 60942-1:2003 (Calibrated to a reference traceable to NIST)	1551589

Table 1: Equipment used

Results of the surveys are provided in graphical form in Figure 2 on the following page.

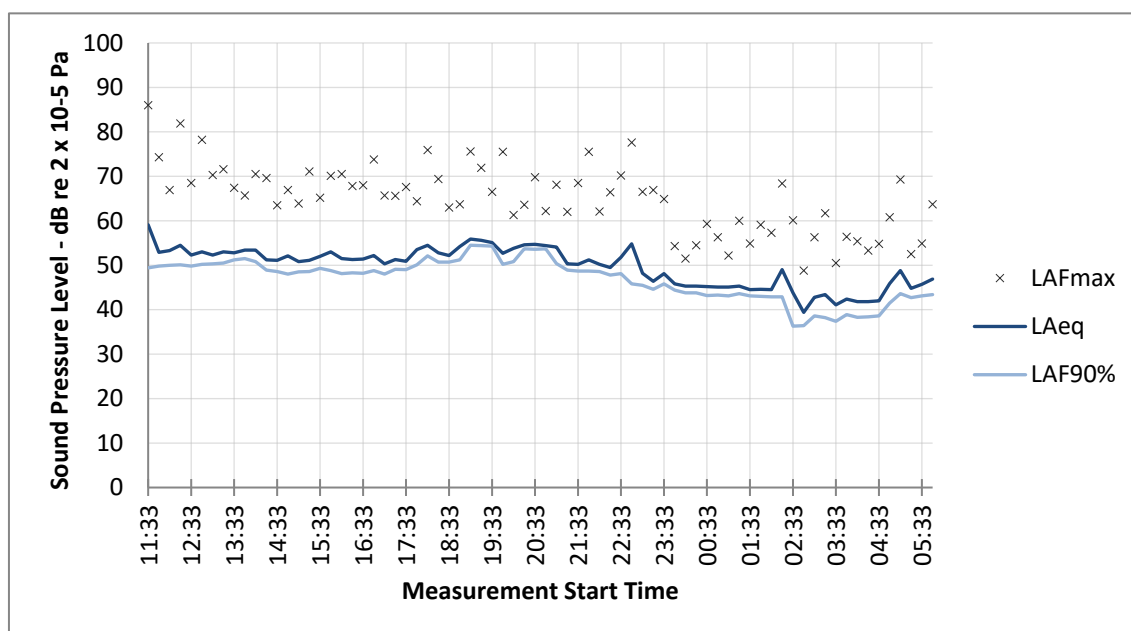


Figure 2: Sound level survey results

Summary of the measured sound levels over the survey are shown in Table 2 below.

25 th – 26 th April 2018	Lowest Measured LA90, 15 min	Reading Borough Council's Criteria
07:00 – 23:00	LA90 46dB	36dBA
23:00 – 07:00	LA90 36dB	26dBA

Table 2: Summary background sound level survey results

The values recorded by ACA Acoustics Limited are used as basis for acoustic design such that sound emissions from any new equipment operating during daytime hours only are ≤ 36 dBA outside the closest noise-sensitive windows. Any plant and equipment operating overnight, such as a refrigeration condenser, would be designed to not exceed a level of 26dBA outside closest noise-sensitive windows.

5. ACOUSTIC ASSESSMENT

As the proposed mechanical equipment selections are yet to be finalised, it is not possible to assess the impact of equipment sound emissions on neighbouring residential properties.

Exact specification for individual equipment items will depend on the number of units installed, distance to nearby noise-sensitive properties and other acoustic conditions including acoustic screening and acoustic reflections. However, based on the initial layout shown in Figure 1, indicative permissible levels for the kitchen extract fan operating during daytime hours are approximately LAeq 53dB at 1m, and the refrigeration condenser operating overnight should not exceed a level of approximately 55dBA at 1m.

The above limits are relatively low, and it is recommended that fans should be installed internally within the building with duct-mounted attenuators between the fan and atmospheric terminal. Any plant installed externally must be very low-noise models or may require acoustic screens or enclosures.

Once the design has been finalised it is recommended that ACA Acoustics review the equipment selections to ensure compliance with the criteria set out in Section 4 of this report.