

Noise impact assessment of external mechanical services to be installed at rear of the site

30 Leighton Road, Kentish Town, London, NW5 2QE



Client: N Family Club

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0. SUMMARY

- 0.1. ACA Acoustics Limited has been commissioned to assess the acoustic impact of external mechanical services equipment to be installed at a proposed nursery at 30 Leighton Road, on existing noise-sensitive properties.
- 0.2. A sound level survey has been carried out between the 8th – 11th June 2021 at a position representative of the acoustic soundscape at the most affected noise sensitive residential dwellings. Whilst on site, the author considered the sound climate during the daytime was low and comprised primarily of levels from people within nearby gardens, and railway activity from the nearby railway line. Existing ambient sound levels during the daytime were measured at LAeq 45dB.
- 0.3. The development will incorporate new mechanical services equipment. Calculations using manufacturer's sound level data for the new air conditioning condenser unit confirms that the rating level of the new equipment to the most sensitive receptors will be LAr 27dB during the day, when assessed in accordance with BS 4142:2014+A1:2019. This is at least 10dBA below the representative background sound level during the operating periods and complies with the planning requirements of London Borough of Camden Council.
- 0.4. Noise from the proposed new equipment will not be disturbing or detrimental to the amenity of any nearby residential occupants and no further mitigation measures would be necessary.

1. INTRODUCTION

New mechanical equipment associated with air conditioning is to be installed to serve a proposed nursery at 30 Leighton Road, Kentish Town, NW5 2QE.

ACA Acoustics Limited has been commissioned to carry out an assessment of noise emissions from the proposed mechanical plant and, where necessary, make recommendation to reduce sound levels to ensure that the amenity of nearby noise-sensitive properties is not compromised.

This report presents the results of the assessments.

2. RELEVANT POLICIES, STANDARDS, & GUIDANCE DOCUMENTS

2.1 Noise from Mechanical Services Equipment

Table C in Appendix 3 of Camden Council's Local Plan states that the rating level from proposed industrial and commercial developments (including plant and machinery) should not exceed 10dBA below the existing background level during both daytime and night time periods to achieve the 'green' criteria. In addition, at night there should be no noise events exceeding 57dBA, when assessed 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 obtrusive to obtain a rating level. This rating level is compared against the prevailing background noise outside the noise-sensitive property. Section 11 provides a commentary of the assessment result and advises that:

- a) *Typically the greater this difference [between the rating level and 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.*

Camden Council's criteria is significantly more stringent than that required by the standard and will ensure there are no adverse impacts on nearby occupants.

3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS

The development site is located at 30 Leighton Road, Kentish Town.

The surrounding area is predominantly residential properties, however there is an existing school to the rear of the site, along with a railway station. Residential windows to the rear of the adjoining 28A Leighton Road, along with windows overlooking from the Peckwater Center have been identified as the most sensitive windows.

An aerial photograph of the site and surrounding area, taken from Google Earth, is shown in Figure 1 below. The figure shows the location of the mechanical plant, closest sensitive receptor, and measurement position.

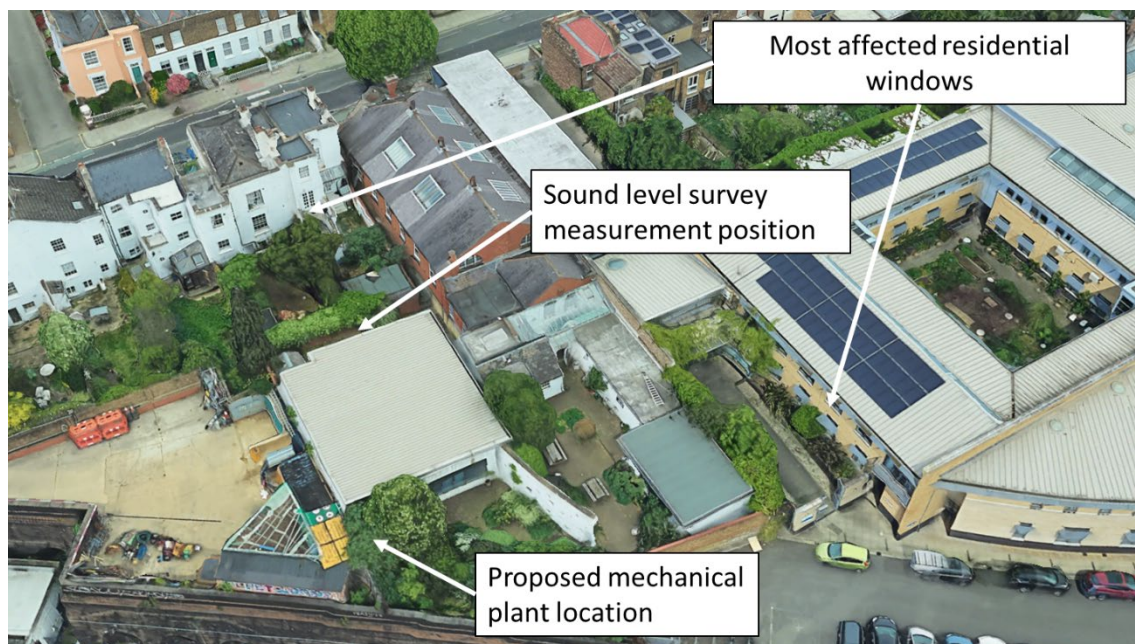


Figure 1: Aerial photograph of the site - Available at www.google.com/maps

Proposed operating times of the nursery are understood to be between 07:00 and 19:00 hours. The mechanical equipment will operate over the same period.

4. BACKGROUND SOUND LEVEL SURVEY

To assess the acoustic impact of the new nursery it is necessary to establish the existing residual and background sound levels in the vicinity. Details of the sound level survey carried out by ACA Acoustics are provided below.

A single measurement position was selected to the front small external garden space. This location was considered to be a worst-case position, due to the sheltered nature of the position, screened from nearby noise sources.

The site was considered secure and therefore an unattended survey was carried out over nominally a 4-day period between 8th – 11th June 2021.

Weather conditions at the time of setting up the survey consisted of a temperature of 24°C, 20% cloud with negligible wind and dry ground conditions. Weather conditions have been reviewed at www.worldweatheronline.com, using the closest available commercial weather station. The extended nature of the survey ensures that a reasonable sample of results have been recorded with appropriate weather conditions and meteorological conditions are not considered to have adversely impacted the outcome of the assessment.

Sound level measurements were recorded in terms of 15-minute samples of overall LAeq, LA90, and LAfmax values along with other statistical indices and octave band spectra.

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

Equipment	Serial Number
Svantek Class 1 sound level meter type SVAN971, complete with MOLES weatherproof and lockable outdoor environmental kit	84045
Svantek calibrator type SV33B. Compliant to IEC 60942-1:2003 (Calibrated to a reference traceable to NIST)	83826

Table 1: Equipment used for the sound level survey

Results of the survey are shown in graphical form in Figure 2 below.

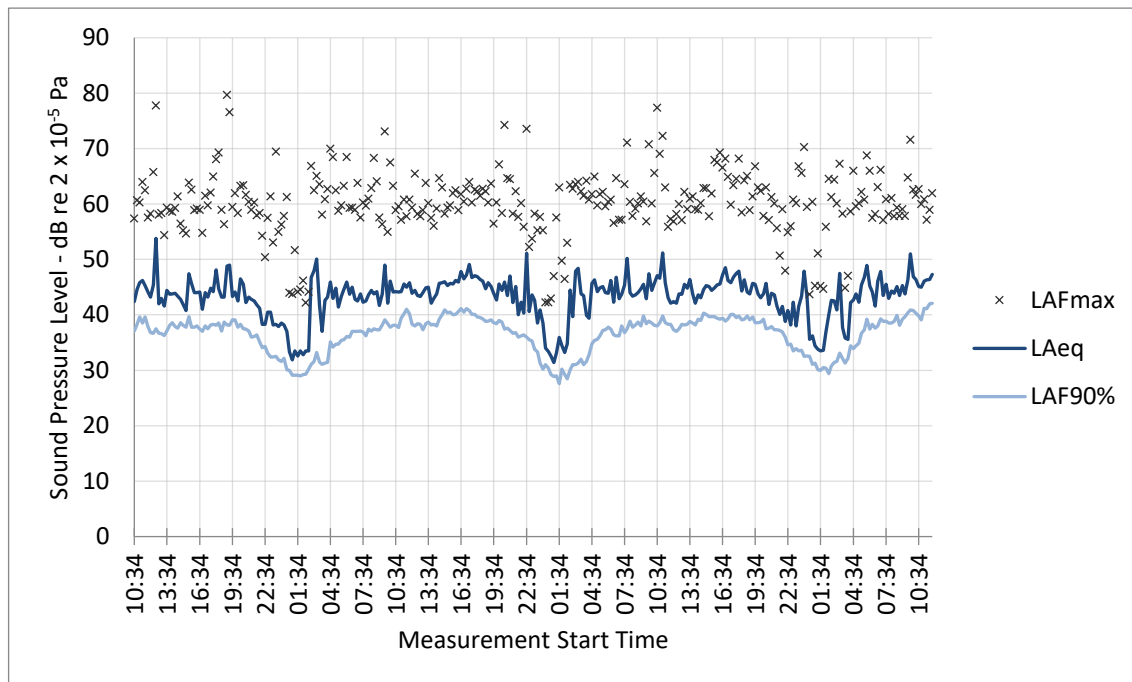


Figure 2: Sound level survey results

In accordance with BS 4142:2014+A1:2019, the prevailing background sound level is not necessarily taken to be the lowest recorded values, but rather the level that best represents the typical background sound level in the area over a defined period. A statistical analysis of the measured background sound levels has been carried out, generally following suggested guidance contained in Section 8 of the Standard. A histogram of measured sound levels is shown below for use within the assessment of noise from mechanical equipment serving the nursery between 07:00 – 19:00 hours.

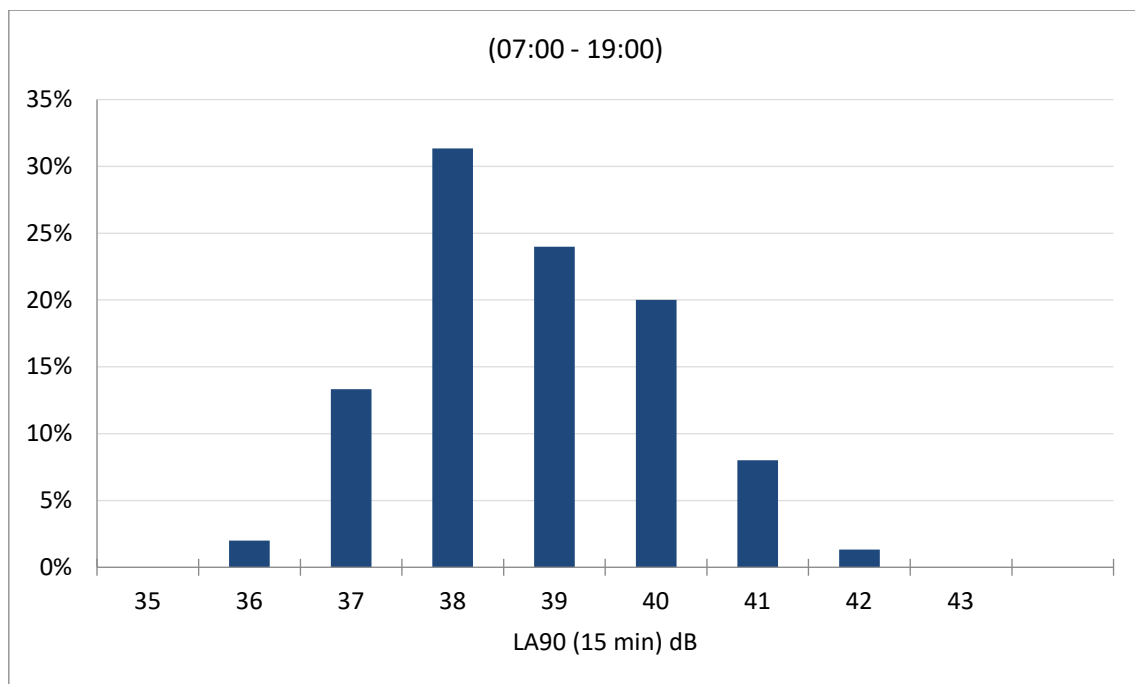


Figure 3: Statistical analysis of measured LA90 sound levels over the daytime measurement period

From results in Figure 3, sound levels taken as being representative of the background are LA90 38dB during the proposed nursery operating period.

Summary results are shown in Table 2 below. As the nursery is only operating between the hours of 07:00 – 19:00, the values shown below are for these time periods.

Date	LAeq, 12-hour 07:00-19:00	LA90 07:00- 19:00	LAfmax ¹ 07:00 – 19:00
Entire measurement period (08 th – 11 th June 2021)	45dB	38dB	69dB

Table 2: Summary sound level survey results

¹: The 10th highest measured LAfmax values over the daytime period between 07:00 and 19:00 have been reported as being representative of a typical ‘high’ LAfmax value.

5. NOISE FROM MECHANICAL SERVICES PLANT AND EQUIPMENT

The development includes the installation of a new VRF condenser unit. Confirmation of the equipment model used in the assessment is provided in Table 3 below.

Description	Equipment Model	Quantity
VRF Condenser	Mitsubishi PURY-EP850YSNW-A	1

Table 3: Proposed new mechanical equipment used in the assessment

Sound emissions from the mechanical equipment can be determined from manufacturer’s published data.

A computer model has been used to calculate the noise contribution from the proposed plant to outside nearest noise-sensitive windows. Environmental corrections are calculated using the assessment method of ISO 9613-2:1996.

The calculated specific sound level from the condenser to outside the closest sensitive residential windows is shown in Table 4. Summary print outs from the calculation model is included in Appendix .

Receptor Location	Calculated Equipment Sound Level
28A Leighton Road	25dBA
The Peckwater Center	26dBA

Table 4: Calculated cumulative equipment sound levels at 1m outside noise-sensitive windows

Assessment of the calculated rating level at the most affected property (28A Leighton Road) in accordance with BS 4142:2014+A1:2019 is provided in Table 5. The assessment includes benefit of acoustic treatment as detailed within Section 6.

Description	Receptor at 28 A Leighton Road	Relevant Clause	Commentary
Calculated specific sound level to receptor	LAeq 26dB	7.1 7.3.6	New plant operating. Refer calculation sheets in Appendix B
Background sound level	LA90 38dB	8.1.3 8.3	Representative background sound level during operating period (07:00 – 19:00).
Acoustic feature correction	+0dB	9.2	The calculated specific sound levels do not indicate any tonal component, the equipment will be ≥ 10 dBa below the background sound level therefore it is unlikely any acoustic characteristics will be audible.
Rating level	LAr 27dB	9.2	
Excess of rating level over background sound level	-11dB	11	Assessment indicates negligible likelihood of adverse impact

Table 5: BS 4142:2014+A1:2019 Assessment

Table 5 shows the rating level of the proposed new equipment will be at least 10dBA below the representative background LA90 sound level to outside the closest noise-sensitive properties.

BS 4142:2014+A1:2019 requires an assessment to consider the context of the development, rather than simply adhering to numerical values. Considering the calculated numerical value of the specific sound, allowing a reduction through partially open windows of 15dBA, as recommended in BS 8233:2014, sound levels inside the neighbouring dwellings due to the proposed new equipment will be approximately 11dBA. This is significantly below guideline levels for resting during the daytime LAeq 35dB, set out in BS 8233:2014 and is further confirmation that sound levels from the new mechanical equipment should not be detrimental to the amenity of any noise-sensitive receptors in the vicinity.

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.

6. MECHANICAL SERVICES EQUIPMENT MITIGATION TREATMENT

As discussed above, it is recommended that noise control treatments are incorporated in the design to ensure that noise emissions from the new plant are low and not disturbing to nearby residential occupants.

It is advised that an acoustic louvre is installed surrounding the condensing unit with no gaps at the edges. A suitable louvred enclosure would typically be formed from 300mm deep acoustic louvres such as Allaway Acoustic's AL3015 model or equivalent. Minimum insertion loss performance for the louvres is shown on the schedule in Appendix B.

Structural supports/steelwork and access panels or doors may be required and should be determined by the successful supplier accordingly.

7. CONCLUSION

The client is preparing a planning application for a proposed nursery at 30 Leighton Road, London Borough of Camden.

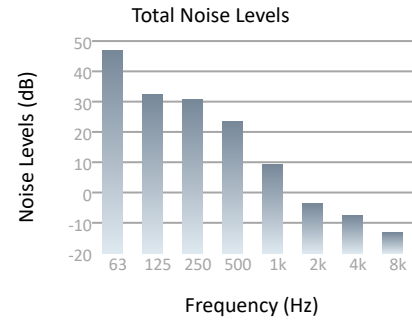
With benefit of noise control treatments as detailed within this report, the calculated Rating Level from new external mechanical plant will not be detrimental to the amenity of nearby occupants.

The site is suitable for the proposed development with no further noise mitigation measures necessary.

Appendix A

Calculation Sheets for Mechanical Services.

Project Name	N Family Club - Kentish Town
Project Reference	210604
Reference	Nearest windows of The Peckwater Center
Description	
Noise Limit	28
dBA	26



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
CU1	1	47	32	31	24	9	-4	-8	-13

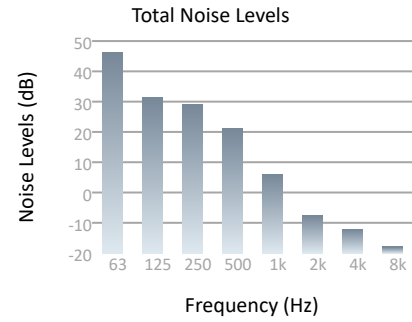
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Calculation Sheet

CU1 to Nearest windows of The Peckwater Center

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Noise Source								
Noise Source - CU1								
Noise Levels	96.0	85.0	88.0	86.0	80.0	76.0	70.0	66.0
Noise Control Treatments								
Treatment - Acoustic Enclosure								
	-5.0	-6.0	-8.0	-11.0	-18.0	-25.0	-20.0	-16.0
Dc - Condenser Directivity								
	2.7	0.5	-1.7	-3.0	-3.0	-3.0	-3.0	-3.0
Adiv - Geometrical Divergence								
	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9
Aatm - Atmospheric Absorption								
	0.0	0.0	0.0	-0.1	-0.1	-0.3	-1.2	-4.1
Agr - Ground Attenuation								
	3.0	0.2	0.5	1.5	1.5	1.5	1.5	1.5
Abar - Barrier Attenuation								
	-8.0	-5.4	-6.2	-8.0	-9.2	-10.9	-13.1	-15.6
External Receiver								
External Receiver - Nearest windows of The Peckwater Center								
Sound Pressure, Lp:	46.7	32.4	30.6	23.6	9.3	-3.6	-7.6	-13.1

Project Name	N Family Club - Kentish Town
Project Reference	210604
Reference	Windows of 28A Leighton Road
Description	
Noise Limit	28
dBA	25



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
CU1	1	46	31	29	21	6	-8	-12	-18

210604-ER-2A

Calculation Sheet

CU1 to Windows of 28A Leighton Road

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Noise Source								
Noise Source - CU1								
Noise Levels	96.0	85.0	88.0	86.0	80.0	76.0	70.0	66.0
Noise Control Treatments								
Treatment - Acoustic Enclosure								
	-5.0	-6.0	-8.0	-11.0	-18.0	-25.0	-20.0	-16.0
Dc - Condenser Directivity								
	2.7	0.5	-1.7	-3.0	-3.0	-3.0	-3.0	-3.0
Adiv - Geometrical Divergence								
	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9
Aatm - Atmospheric Absorption								
	0.0	0.0	0.0	-0.1	-0.1	-0.3	-1.2	-4.1
Agr - Ground Attenuation								
	3.0	0.2	0.5	1.5	1.5	1.5	1.5	1.5
Abar - Barrier Attenuation								
	-8.6	-6.4	-7.8	-10.4	-12.4	-14.9	-17.6	-20.4
External Receiver								
External Receiver - Windows of 28A Leighton Road								
Sound Pressure, Lp:	46.2	31.4	29.1	21.2	6.0	-7.6	-12.1	-17.9

Appendix B

Noise Control Treatments for Mechanical Services.

Schedule of Noise Control Treatments

Reference	Location	Description	Insertion Losses (dB)							
			63	125	250	500	1k	2k	4k	8k
Acoustic Enclosure		AL3015	5	6	8	11	18	25	20	16