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Post Install survey relating to fixed plant at the ASDA store at:

London Road
Ashington
Pulborough
RH20 3JT

for:

Healy Refrigeration & Air Conditioning Services Ltd

on behalf of:

The Co-operative Group

Report Reference: B5774 2025-04-14 Co-op Ashington London Road PI R

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Principal Acoustician

Version Number	Notes	Issued By	Issue Date
B5774		KT	14 April 2025

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1.0 Introduction

1.1 Acoustical Control Consultants (ACC) has been appointed to conduct a post installation survey in relation to plant installed at the Co-operative food store in Ashington.

1.2 The survey was requested by the landlord to determine the current sound being emitted by the plant at the site. This report details the post installation acoustic survey conducted at the store, and the resulting analysis and assessment of the measurements and observations undertaken.

1.3 ACC is an independent acoustic consultancy company. All our acoustic consultants are qualified and experienced practitioners and are either Associate or Corporate members of the Institute of Acoustics. Acoustical Control Engineers Limited is our associated company specialising in engineered solutions to acoustic problems.

2.0 Scope

2.1 Conduct a post installation acoustic survey during a period of low residual activity with the assistance of an engineer (see 5.2 for more information) to control the equipment where appropriate.

2.2 Compile a post installation acoustic assessment report detailing the findings of the survey, demonstrating compliance with the set criteria, if appropriate, and recommending mitigation measures if required.

3.0 Criteria & Installed Equipment

3.1 The survey was instructed on behalf of the landlord who requested a report detailing the sound from the existing plant at the store.

3.2 Prior to the post installation acoustic survey, research into the planning application was conducted on Horsham District Council public access planning portal. The most recent application relating to fixed plant and equipment at the store was application ref: DC/21/0950. Condition 3 of the application is duplicated below:

> ***Post-Installation Condition**: Within 6 weeks of the date of commissioning all equipment and plant, a noise assessment shall be undertaken and submitted to the Local Planning Authority for its approval in writing. The noise assessment shall be caried out by a competent person in order to confirm that the noise target set out in the Acoustical Control Consultants report (dated 06 May 2021, reference B5360 2021-05-06 R) has been met for both day and nighttime operation. The assessment shall include any additional measures necessary to mitigate any additional noise impact and a timetable for their implementation. The equipment and plant shall thereafter the maintained in accordance with the agreed details.*

3.3 It is not known whether a post installation acoustic assessment was carried out in accordance with this condition, and the acoustic report referenced (B5360 2021-05-06 R) contains an assessment of plant which differs from the equipment that is currently installed.

3.4 The conditioned report contains suitable criteria to be achieved by all equipment operating at full load in unison. The report stated that "*all proposed fixed plant and equipment should not exceed a cumulative design rating level of 44 dB L_{Ar} at the nearest receptor during the daytime and 36 dB L_{Ar} at the closest noise sensitive windows at night*." The installed plant will be assessed against these criteria.

4.0 Site Layout

4.1 The store is located to the east of London Road in Ashington, around 150 m west of the A24 which runs in a north/south direction. The store is in the southern part of a building that also contains a takeaway (no fixed plant from this unit was operating during the survey). Access to the store and the car park for around 10 vehicles is from Turnpike Way to the south. The service yard is to the east of the building accessed via Turnpike Way. This is where the plant is located.

4.2 There is a plant area close to the store's eastern façade. A combined refrigeration pack and condenser, and two air conditioning condensing units (AC) are installed in this area. There is a bespoke acoustic screen installed in front of the plant. There is an extract fan to the store's eastern façade further south of the plant area. There are dwellings to the east and south of the store.

4.3 The most sensitive receptor is the dwelling to the east. The garden and north facing windows are most sensitive to sound from the plant area, and the south facing windows are most sensitive to sound from the extract fan.

4.4 Figure 4.1 shows the relative positions of the store (red outline), dwellings that are most sensitive to noise from the plant, particularly during the night (green outline), the plant area (blue outline), extract fan location (orange line) and measurement location (numbered marker).

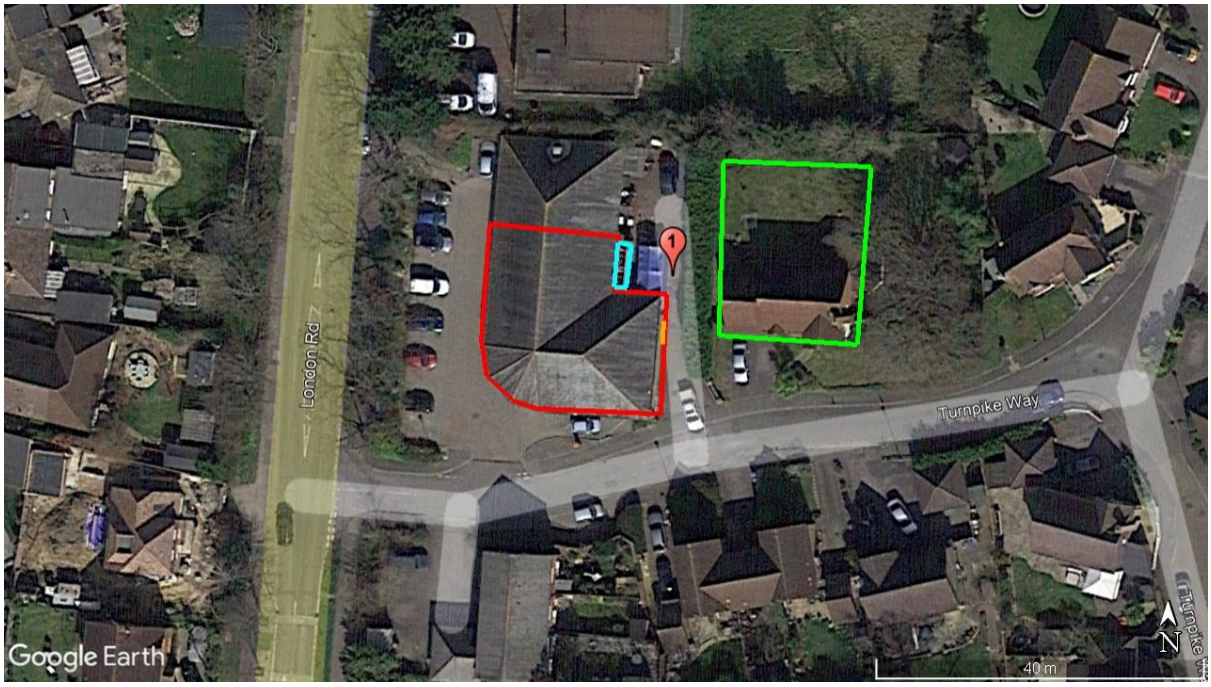


Figure 4.1 – Site Plan

5.0 Survey & Assessment

5.1 A post installation survey was conducted on Tuesday 3rd December 2024 by Kristoffer Tsinontas BSc (Hons), MIOA.

5.2 An engineer was in attendance who was able to switch the extract fan on/off and force the refrigeration and AC equipment to operate at full load for the purpose of the test.

Instrumentation

Cirrus Sound Level Analyser Type CR171B, Serial No. G301578
Cirrus Calibrator Type CR 515, Serial No. 73201
Cirrus Windshield
Skywatch Meteos Anemometer

5.3 An operational reference check was undertaken before and after the measurements using the calibrator. The instrument displayed negligible drift in calibration. The instrumentation holds valid calibration certificates, which are available on request.

5.4 Weather conditions at the measurement location were logged throughout the survey. During the survey there was 20% cloud cover, there was no wind, the ground surfaces were dry, and the temperature was around 10°C. The weather conditions were suitable according to relevant guidance for measurements to be undertaken.

Results

5.5 The results of the measurements are shown in Graph 1 which is embedded below the measurement descriptions in the next few paragraphs and is available in full size in Appendix 1.

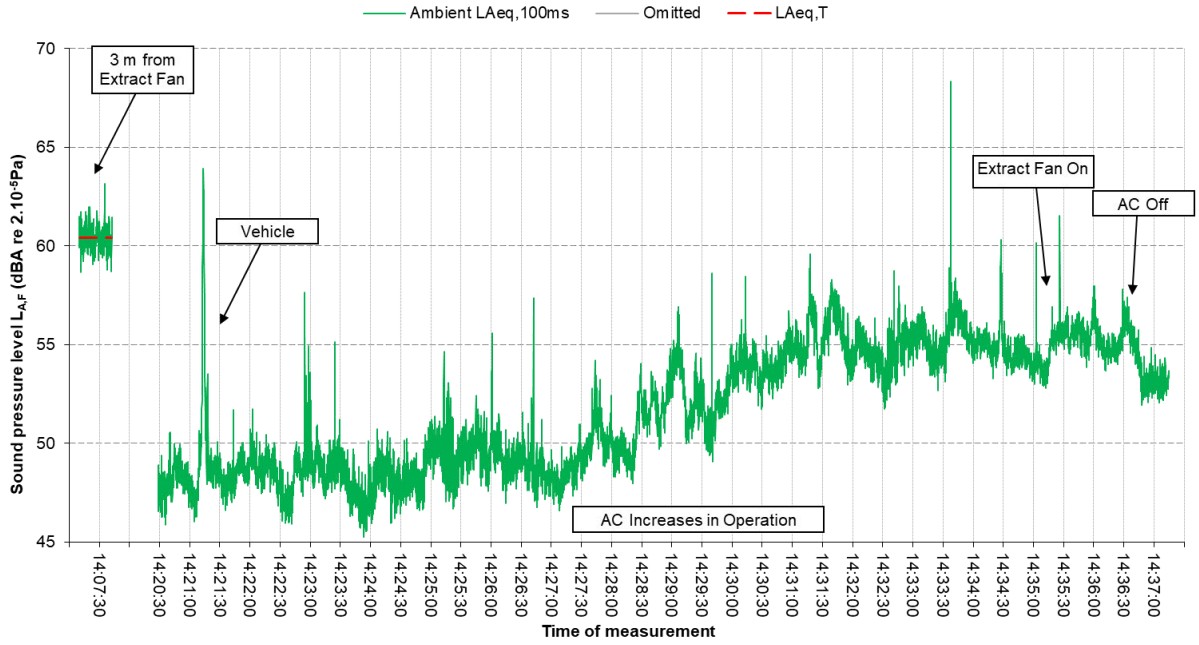
5.6 Two measurement series are displayed on Graph 1. The first measurement was made 3 m from the store extract fan (shown in orange in Figure 4.1). The second measurement was made at Location 1, around 7 m from the plant area.

5.7 During the first measurement the extract fan was the dominant sound source, so there was no significant influence from residual sound during the measurement. The sound level was around 60 dB $L_{Aeq,T}$.

5.8 The second measurement was made at Location 1. The extract fan and AC were switched off prior to the start of the measurement. The refrigeration pack was operating at full load at the start of the measurement. However, sound from the refrigeration unit was inaudible over sound from the residual acoustic environment. The residual sound level was around 48 dB L_A.

5.9 The two AC units were switched on at around 14:48 and the units' operation steadily increased with the underlying sound level increasing from 47 dB L_A to around 55 dB L_A.

Graph 1 - Existing sound level from plant at Co-op Ashington
Measured 12th March 2025



6.0 Analysis

Calculated Sound Level from the Plant at the Receptors

6.1 Calculation Sheet 1 at Appendix 2 shows the calculations used to determine the sound level from plant at the receptors.

6.2 The sound level measured 3 m from the extract fan was 60 dB L_A. There was no audible contribution from residual sound, which correlates with the residual sound level taken from the second set of measurements, which was 48 dB L_A. Therefore the plant sound level was around 60 dB L_A. The south facing windows of the dwelling are around 14 m from the extract fan, so adding a correction of -13 dB to account for the increased distance, and an off-axis correction of -4 due to the windows orientation in relation to the extract fan gives a resulting fan sound level outside the dwelling windows of 42 dB L_A.

6.3 The extract fan operates 24 hours a day as it services an internal cold room which dumps excess heat within the store, so the specific sound level due to the extract fan will be **42 dB L_A outside the relevant dwelling windows during the day and night**.

6.4 The residual sound level close to the start of the second measurement was 48 dB L_A. Sound from the refrigeration unit, which was operating at full load at this time, was inaudible. The sound from the refrigeration unit is therefore, at most, around 38 dB L_A at the measurement location.

6.5 The sound level when the AC was operating at full load was 56 dB L_A**.** Correcting for the residual sound level of 48 dB L_A gives a sound level due to the AC of 55 dB L_A. The daytime receptor (dwelling garden) is 14 m from the plant area, so adding a correction of -6 for the additional distance, and -5 dB for the screening due to the intervening boundary wall, gives a sound level of around **44 dB L_A in the garden during the day**.

6.6 The AC units do not operate during the night time. Assuming the refrigeration unit is producing, at most, 38 dB L_A at the measurement location, then adding a correction of -6 dB to account for the additional distance to the relevant dwelling windows gives a sound level of, at most, around **32 dB L_A due to the refrigeration unit during the night.**

6.7 The plant at the store did not exhibit acoustically distinguishable characteristics that would incur a feature correction, so the rating levels will be numerically the same as the calculated total specific sound levels.

Comparison between Calculated Sound Levels and Criteria

6.8 ACC's suitable criteria were for the cumulative rating level from the proposed plant to not exceed 44 dB L_{Ar} during the day and 36 dB L_{Ar} during the night at the most sensitive receptors.

6.9 The calculated sound levels in the garden and the north facing windows due to plant in the plant area were around 44 dB L_{Ar} during the day and 32 dB L_{Ar} during the night, and sound from the plant area complies with the suitable criteria for the day and night.

6.10 The calculated sound level at the south facing windows due to the extract fan was around 42 dB L_{Ar} during the day and night. Sound from the extract fan therefore exceeds the suitable night time criterion by 6 dB and suitable mitigation should be installed to reduce sound from the extract fan.

7.0 Conclusions

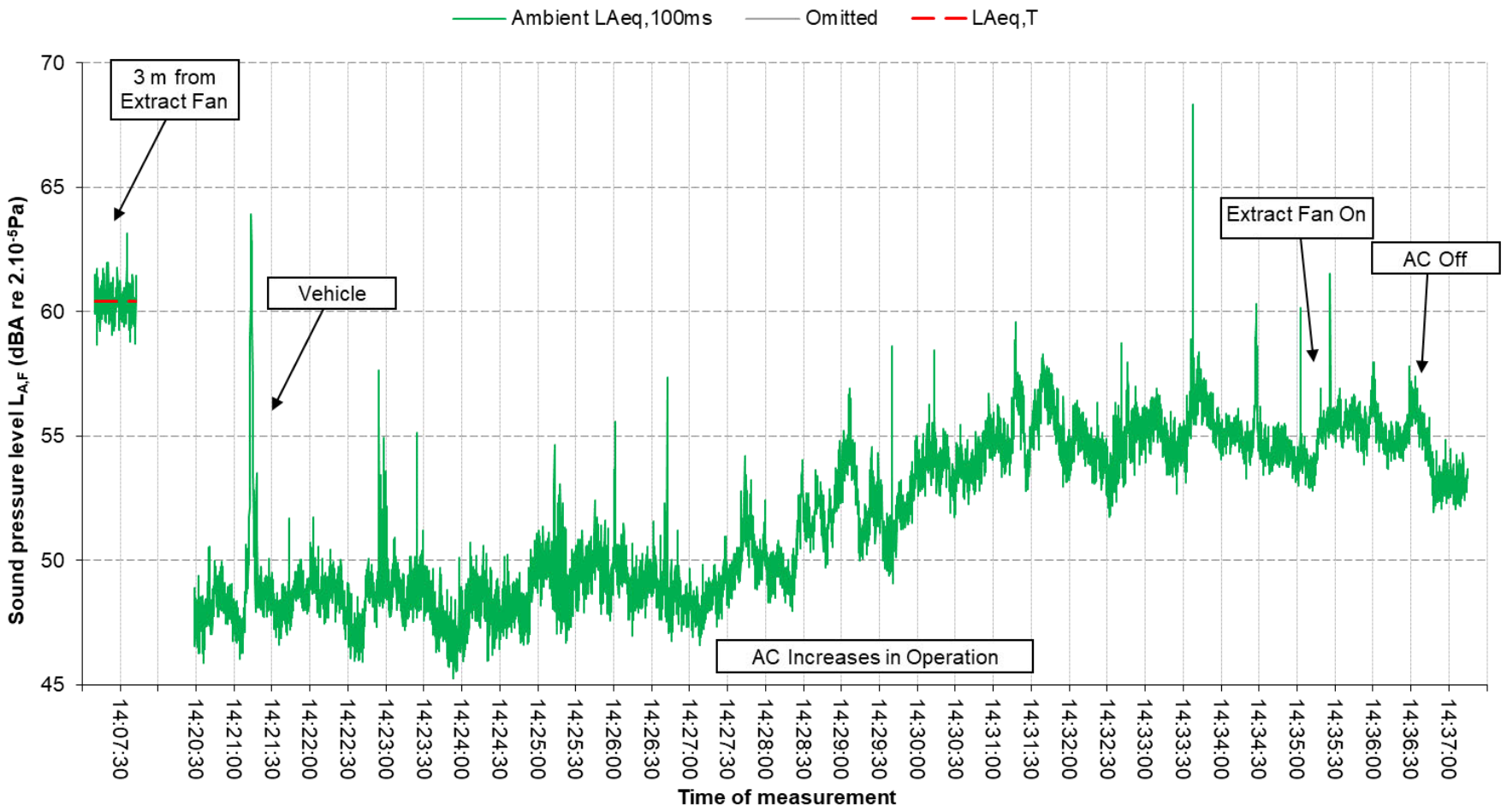
7.1 Acoustical Control Consultants has been appointed to conduct a post installation assessment of the plant at the Co-op food store on London Road, Ashington.

7.2 The results of the post installation acoustic survey were reviewed against the suitable sound level criteria previously conditioned by the local planning authority. The measurements made during the survey show that the installed plant in the plant area complies with the suitable criteria. The sound level from the extract fan exceeds the suitable night time criterion by 6 dB.

7.3 The sound level produced by the extract fan should therefore be mitigated by 6 dB to comply with the suitable night time criterion. This can be achieved by moving the extract fan aperture further to the north so that it is screened from the south facing windows by the receptor building. Alternatively, a suitable ductwork attenuator can be installed to provide the required reduction.

Appendix 1 Measurement Graphs

Graph 1 - Existing sound level from plant at Co-op Ashington
Measured 12th March 2025



Appendix 2 Calculation Sheets

Calculation Sheet 1 - Calculated Sound Levels at Receptor to East					
Line	**Details**		**m**	**dBA**	**Notes**
1	Ambient Sound Level at 3 m from extract fan			60	
2	Residual Sound Level at Location 1			48	
3	Specific Sound Level at 3 m from extract fan			60	Line 1 - Line 2
4	Distance to Receptor South Window		14	-13	
5	Directivity			-4	Off-axis
6	**Sound Level at Southern Windows Receptors due to Extract Fan**			**42**	Day & Night. Receptors screened from main plant area, so no cumulative effect
7	Ambient Sound Level at Location 1 (7 m from plant area)			56	All plant maximum capacity
8	Residual Sound Level at Location 1			49	
9	Specific Sound Level at Location 1			55	
10	Distance to Receptor		14	-6	
11	Screening			-5	
12	**Sound Level at Garden Receptor due to Plant in Plant Area**			**44**	Daytime

Annex A Competence & Experience

A.1 Acoustical Control Consultants Limited has the advantage of personnel that were directly involved in the drafting of BS 4142, who have specialised in the measurement, assessment and control of noise from industrial and commercial sources throughout their careers. This type of work forms a major part of our activity and has done so for several decades. Our culture, systems and working practices are geared towards ensuring that this type of work is consistently undertaken to the high and robust level of quality for which we are known.

A.2 **Richard A Collman** has overall responsibility for ACC's activities including BS 4142 assessments. He graduated with a BSc (Class I) in Acoustics and Computer Science from Salford University in 1984, being awarded the course prize in both the second and final years. He is a Chartered Engineer and has specialised in the measurement and assessment of sound from industrial and commercial plant for over 30 years, writing articles and papers on this subject for Acoustics Bulletin and IOA conferences. He pioneered the use of digital instrumentation for short duration consecutive logging rather than longer term statistical averaging measurement techniques. As an expert on sound from refrigeration and air conditioning plant he represented the Institute of Refrigeration on the BSI committee and the Drafting Panel responsible for the 2014 edition of BS 4142, presented the section on Uncertainty at the BS 4142Launch Meeting in November 2014, and authored an associated Technical Article in Acoustics Bulletin. He has been closely involved in the development of BRL's BS 4142 measurement, assessment and reporting system to ensure that it is fully compliant with all aspects of BS 4142.

A.3 **Mike Hewett,** Principal Acoustician, joined the company in February 2021 bringing with him more than 30 years' experience of Acoustic consultancy. Mike's particular expertise is in the assessment, prediction and control of noise and vibration from structures, plant and equipment. Other skills include acoustic design, environmental acoustics and the assessment and control of vibration. He has managed several large-scale acoustic design projects and is highly experienced in diagnostic techniques including sound mapping, sound intensity and vibration measurements. He is an active member of the Institute of Acoustics has been chair and secretary of the Noise and Vibration Engineering specialist group and chair of the North West regional branch. In 1994 Mike was awarded the prize for the best overall performance in the IOA Diploma and has since presented papers at numerous conferences and seminars.

A.4 **Kristoffer Tsinontas**, Acoustician joined the company in September 2014 and has since been carrying out noise impact assessments primarily for the food retail industry, along with assisting in other larger projects undertaken by the company. Kristoffer has a BSc (Hons) in Music Technology, whereby he specialised in Acoustics and Psychoacoustics – particularly in modelling acoustic soundscapes. Kristoffer is a member of the Institute of Acoustics.