ACOUSTICAL CONTROL Engineers & Consultants

GUARANTEED SOLUTIONS TO YOUR NOISE & VIBRATION PROBLEMS

Post Install survey relating to fixed plant at the Co-op Food store at:

Co-op 135-141 Withington Road
Whalley Range
Manchester
M16 8EE

for:

City Building Engineering Services

on behalf of:

The Co-operative Group

Report Reference: B5775 2025-10-06 Co-op Whalley Range PI R

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1.0 Introduction

1.1 As part of planning application ref: 142427/FO/2025, a condition was imposed requiring a post-installation acoustic assessment of installed fixed plant. The condition requests a '*verification report*' containing information that '*the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report*'.

1.2 Acoustical Control Consultants (ACC) has been appointed to conduct a post installation survey to measure and assess the sound from the installed fixed plant and equipment. 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 to measure sound from the new fixed plant and equipment.

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 Condition 6 of application ref: 142427/FO/2025 is duplicated below:

> *6) a) The development shall be implemented in accordance with CR3 Plant Layout plan ref: CR3-CBES- WHALLEY , and Environmental Noise Survey and Noise Impact Assessment Report ref: 31862/NIA dated 5 March 2025 as updated by contents of email from the planning agent dated 15th May 2025 incorporating a reply from the applicant's acousticians related to the noise levels in connection with external plant and background noise levels.*
>
> *b) Prior to the operation of the units, a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non-conformity with the recommendations in the verification report shall be detailed along with any measures required to be undertaken prior to operation of the scheme to ensure compliance with the agreed noise criteria.*
>
> *Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site pursuant to policies SP1, and DM1 of the Manchester Core Strategy (2012), and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995).*

3.2 The condition refers to the Hann Tucker Associates report ref: 31862/NIA dated 05/03/2025. The report contained an assessment of the new refrigeration pack and gas cooler.

3.3 Suitable criteria are included in the report for all assessed equipment operating at full load in unison. The table in section 9.1 (included below) shows a cumulative design rating level of 44 dB L_{Ar} at the most sensitive receptor during the daytime and 43 dB L_{Ar} at the most noise sensitive receptor at night. The installed plant will be assessed against these criteria.

Location	Plant Noise Emission Criteria ($L_{Aeq,T}$, dB)	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
1	44	43

3.4 The pack and gas cooler can operate at any time of the day or night. The gas cooler always operates at a set design speed.

4.0 Site Layout

4.1 The store is located in Whalley Range, around 2 km south of Manchester City Centre. Major roads surround the site, with the B5218 Withington Road adjacent to the west, Princess Road located 800 m to the east, and the A6010 located 800 m to the south. A vehicle repair shop is to the north of the store. The store car park, accessed via Mayfield Road to the south, is located to the east of the building and provides parking for around 15 vehicles. Access to the store service yard is through the car park, with the goods-in area situated to the north of the store building. The general area is a mixture of commercial premises on Withington Road, some with dwellings above, dwellings on the side roads, and educational buildings within 300 m to the east and south.

4.2 Following the recent modifications to the store, the plant area now consists of a refrigeration pack located in a plant room to the north of the building, and a gas cooler to the east of the plant room. The retained air conditioning condensing units (AC) were located along the store's eastern façade, and have been moved a few metres to the north, parallel to the most noise sensitive receptor to the east.

4.3 As the AC units have not changed, remain the same distance from the most sensitive receptors, and are acoustically unchanged, this assessment will focus on the new refrigeration pack and gas cooler specified in the acoustic assessment issued with the planning application.

4.4 The most sensitive receptor is the dwelling to the east. The garden is the most sensitive daytime receptor, and the internal areas for the first floor north-facing windows are considered the most sensitive nighttime receptor.

4.5 Figure 4.1 shows the relative positions of the store (red outline), dwellings that are most sensitive to noise from the plan (green outline), and the plant area (blue outline).



Figure 4.1 – Site Plan

5.0 Survey & Assessment

5.1 A post installation survey was conducted on Tuesday 30th September 2025 by Kristoffer Tsinontas BSc (Hons), MIOA.

5.2 An engineer was in attendance who was able to operate the compressor pack at maximum load and to set the gas cooler to operate at its maximum design speed 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 15°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 provided at larger size in Appendix 1.

5.6 Upon arriving at the site, a delivery was being unloaded, and various works were being conducted around the site. Measurements below will be corrected to account for the influence of residual activity during the analysis, but in some cases the measurements may still overstate the sound from the fixed plant, meaning the actual sound levels at receptors could be lower than those assessed.

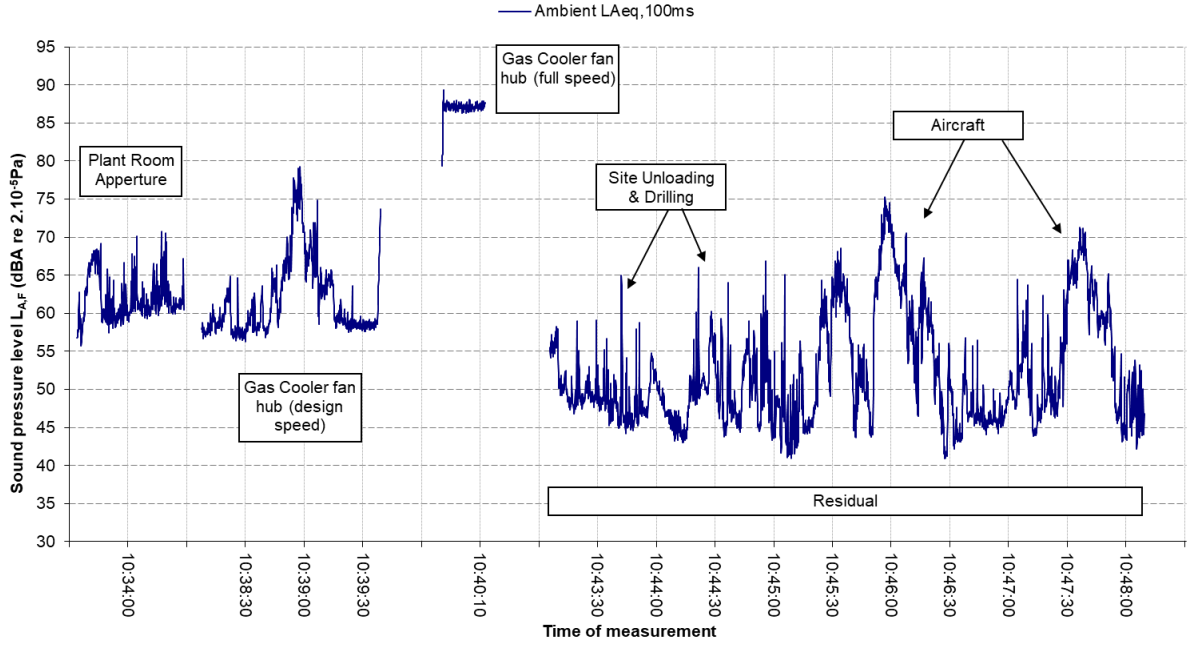
5.7 Four measurement series are displayed on Graph 1. The first measurement was made at of the four plant room apertures. The second and third were made at the hub of one of the gas cooler fans. The fourth measurement was made in the vicinity of the fixed plant to measure residual sound (in the absence of any sound from plant).

5.8 During the first measurement, sound from the pack was the dominant underlying source. There were some extraneous sounds from passing vehicles and other activity on site. The underlying sound level was around 60 dB $L_{Aeq,T}$.

5.9 The second and third measurements were made at the hub of one of the gas cooler fans, at maximum design speed (less than full speed), and then at maximum fan speed. The sound level measured when the gas cooler was operating at design speed was 57 dB L_A, and the sound level when operating at maximum fan speed was 87 dB L_A.

5.10 The fourth measurement was a residual measurement made in the vicinity of the fixed plant which was switched off (or sound from plant was negligible). The underlying sound level was due to passing road traffic and general activity on site. Other sources included aircraft. The underlying residual sound level was around 42 dB L_A.

Graph 1 - Existing ambient sound level from new fixed plant at Co-op Whalley Range
Measured 30th September 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 power level of the fixed plant.

6.2 The indicative sound intensity level measured at the plant room aperture was 60 dB L_A. Correcting this for the influence from residual sound (42 dB L_A) give a specific sound level of 60 dB L_A. Correcting for the area of the four plant room apertures that face the receptors gives an area correction of -8 dB, resulting in a sound power level of 52 dB L_{WA} from the plant room apertures.

6.3 The sound level measured at one of the fan hubs for the gas cooler (when operating at maximum design speed) was 57 dB L_A. Correcting this for the influence from residual sound (42 dB L_A) give a specific sound level of 57 dB L_A. Correcting for the area of the fan gives an area correction of -4 dB, resulting in a sound power level from the top side of one fan of 53 dB L_{WA}. Adding a correction for the two additional fans, as well as the bottom side of the fans, gives a total sound power level from the gas cooler fans of 61 dB L_{WA}.

6.4 Calculation Sheet 2 at Appendix 2 details the calculated cumulative sound pressure level at the receptors for sound from the plant, based on the sound power level determinations above. Corrections are then included to account for separation distance, screening (the boundary wall provides line of sight acoustic screening to the garden), reflective surfaces, and directivity (the bedroom windows are off-axis to the plant area).

6.5 **The specific sound level for the plant when operating at maximum design speed is 25 dB L_A during the day and 26 dB L_A during the night at the most sensitive receptors.**

6.6 The plant at the store did not exhibit acoustically distinguishable characteristics that would incur a feature correction. Sound from the plant will be masked by residual sound so would not exhibit acoustically distinguishable characteristics at the most noise sensitive receptors. Therefore the rating levels will be numerically the same as the calculated total specific sound levels.

Comparison between Calculated Sound Levels and Criteria

6.7 The suitable criteria in the application acoustic assessment were for the cumulative rating level from the proposed plant to not exceed 44 dB L_{Ar} during the day and 43 dB L_{Ar} during the night at the most sensitive receptors.

6.8 The calculated sound levels in the garden and the north-facing windows due to plant in the plant area were around 25 dB L_{Ar} during the day and 26 dB L_{Ar} during the night, respectively. Sound from the plant area therefore complies with the suitable criteria for the day and night.

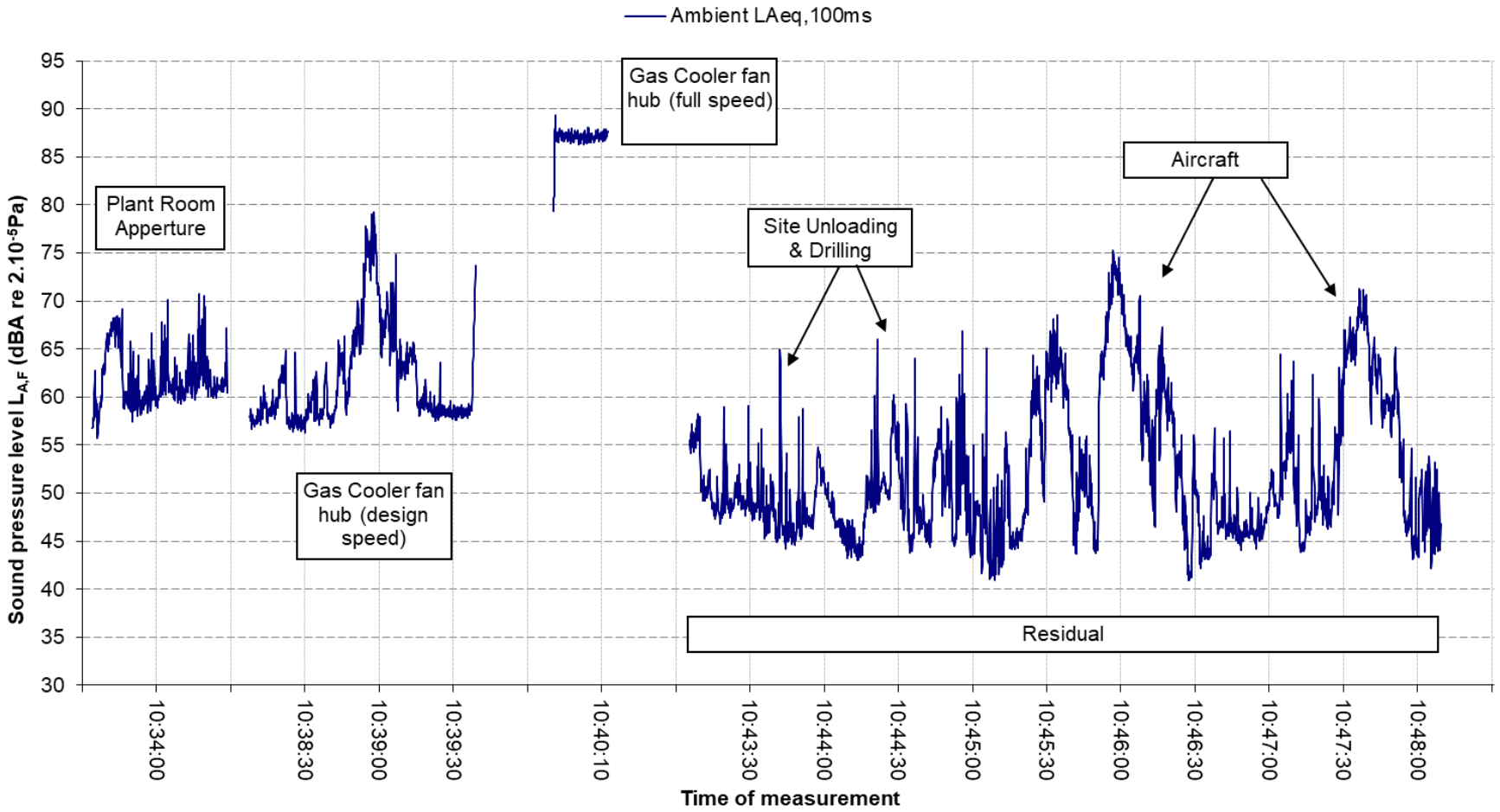
7.0 Conclusions

7.1 Acoustical Control Consultants has been appointed to conduct a post installation assessment of the plant at the Co-op food store in Whalley Range, Manchester.

7.2 The results of the post installation acoustic survey were reviewed against the suitable sound level criteria 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.

Appendix 1 Measurement Graphs

Graph 1 - Existing ambient sound level from new fixed plant at Co-op Whalley Range
Measured 30th September 2025



Appendix 2 Calculation Sheets

Calculation Sheet 1 - Calculated Sound Power Levels of Plant during Post Install Survey				
Line	**Details**	**m**	**dBA**	**Notes**
1	Ambient Sound Level Measured at Plant Room Apperture		60	Indicative Intensity Scan over apperture
2	Specific Sound Level Measured at Plant Room Apperture		60	Line 1 log subtract 42 (residual sound level)
3	Approx. Area of Plant Room Appertures. Correction from Lp to Lw	0.16 m	-8	10 Log (area) (4 appertures, 20cm^2 each)
4	**Lw from Plant Room Appertures**		**52**	**Line 1 + Line 2**
5	Ambient Sound Level at Fan Hub		57	Indicative Intensity measurement at fan hub
6	Specific Sound Level at Fan Hub		57	Line 5 log subtract 42 (residual sound level)
7	Approx. fan diameter (d), correction from Lp to Lw	0.70 m	-4	10 Log (π d^2 / 4)
8	Lw from 1 Fan		53	Line 6 + Line 8
9	Correction for 3 fans + Correction for underside of fan		8	10 Log (3) + 10 Log (2)
10	**Lw from Gas Cooler**		**61**	**Line 8 + Line 9**

Calculation Sheet 2 - Calculated Sound Level from Plant at Receptor

Unit	Sound Level Data		Propagation							Notes
	dBA	at (m)	m to receptor	Dist. Atten.	Surfaces	Reflectivity	Screening	Directivity Atten.	Result	
Space 2C-2M INT Pack	52	LwA	20	-34	Flat	0	-5		13	
Kelvion GF-SA103G3H	61	LwA	20	-34	1 Wall	+3	-5		25	
									25	Total Sound Level at Most Sensitive Receptor during Day
2C-2M INT Pack	52	LwA	20	-34	Flat	0		-4	14	
Kelvion GF-SA103G3H	61	LwA	20	-34	1 Wall	+3		-4	26	
									26	Total Sound Level at Most Sensitive Receptor during Night

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.