

The Co-operative
6 Peel Street
Marsden
Huddersfield
HD7 6BR

Plant Noise
Impact Assessment Report

On behalf of



Project Reference: 88479| Revision: - | Date: 23rd April 2024
Revised: 26th July 2024

Document Information

Project Name : Co-op, Peel Street, Marsden, Huddersfield
Project Reference : 88479
Report Title : Plant Noise Impact Assessment Report
Doc Reference : 88479/NIA/Rev1
Date : 23rd April 2024

	Name	Qualifications	Initials	Date
Prepared by:	Adam Meakins	AMIOA	ACM	23rd April 2024
Approved By:	Nigel Chandler	BSc(Hons), MIOA	NAC	23rd April 2024
For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/Approved
1	26/7/2024	Include basement extract fan	ACM	JS

Noise Solutions Ltd (NSL) disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and NSL (Noise Solutions Ltd) accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

© Noise Solutions Ltd (NSL) 2024

Reg no. 3483481 Trading office, 5 Oriel Court, Omega Park, Alton, GU34 2YT

Contents

1.0 Introduction 1

2.0 Details of development proposals..... 1

3.0 Nearest noise sensitive receptors 1

4.0 Existing noise climate 2

5.0 Plant noise design criteria 4

 National Planning Policy Framework4

 Kirklees Council.....5

 BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound6

 Proposed criteria7

6.0 Plant noise impact assessment..... 8

7.0 Summary 9

Appendices

- Appendix A Acoustic terminology
- Appendix B Aerial photograph site showing areas of interest
- Appendix C Environmental sound survey
- Appendix D Manufacturer’s Noise Data
- Appendix E Plant noise calculations
- Appendix F Plant Layout

1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned by City Building Engineering Services to provide a noise impact assessment for replacement plant serving an existing Co-operative store located along Peel Street in Marsden, Huddersfield.
- 1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.
- 1.3. Plant noise levels have been predicted at the nearest residential property and assessed against Kirklees Council's typical requirements.
- 1.4. To assist with the understanding of this report a glossary of acoustic terms can be found in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

- 2.1. The Co-operative store is located at 6 Peel Street on the junction with Market Place in Marsden. The store occupies all floors of a three-storey end-terraced building on the west side of Peel Street.
- 2.2. Replacement refrigeration and air conditioning (AC) plant will be installed externally in the service yard at the rear of the store. The AC unit will operate only when the store is open, the refrigeration plant will operate 24 hours but generally at a reduced duty at night when cooling demands are lower.
- 2.3. There will also be an extract fan from the basement compressor pack room. This will potentially run 24 hours but will be thermostat controlled so will run at a reduced duty at night.

3.0 Nearest noise sensitive receptors

- 3.1. The area surrounding the site is predominantly residential in use. The nearest noise sensitive property to the existing external plant area will be the residential house at 2 Argyle Street (Receptor R1) to the north west of the store, approximately 3m from the proposed plant and with a direct line of sight. There is also a noise sensitive property across Market Place (Receptor R2) to the south of the store, approximately 10m from the proposed plant and with a direct line of sight.
- 3.2. All other residential properties and commercial are further from the plant area, with many also being screened by the building orientation.

- 3.3. A site plan showing the site and surrounding area, the nearest noise sensitive properties and noise monitoring location used in this assessment is presented in [Appendix B](#).

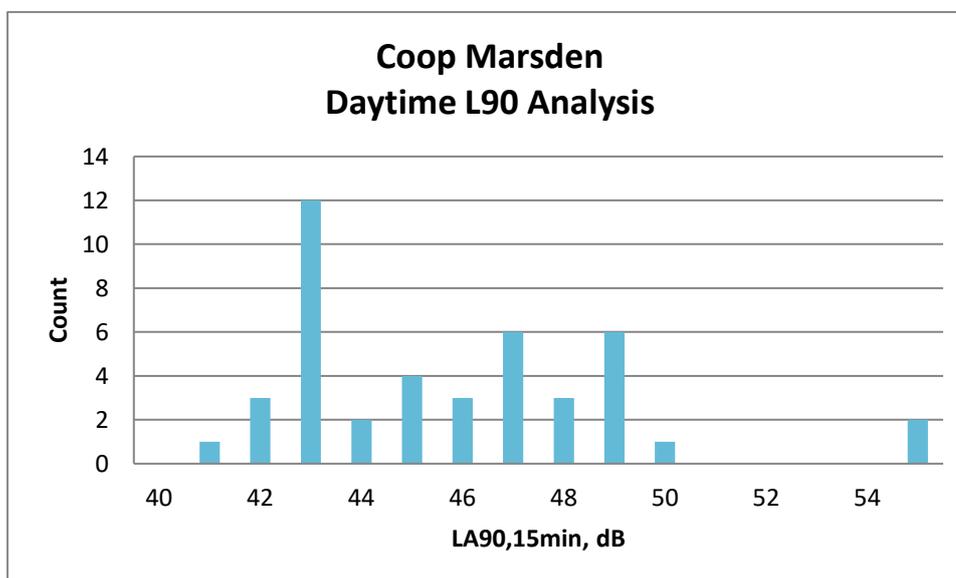
4.0 Existing noise climate

- 4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area, during the quietest times at which the plant will operate.
- 4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in [Appendix C](#).

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	L _{Aeq} (15mins)	L _{AFmax} (15mins)	L _{A10} (15mins)	L _{A90} (15mins)
Daytime (07.00 – 23.00 hours)	50-66	72-93	51-67	41-55
Night-time (23.00 – 07.00 hours)	44-58	60-81	46-58	40-50

Figure 1 Histogram of daytime L_{A90} background sound pressure levels

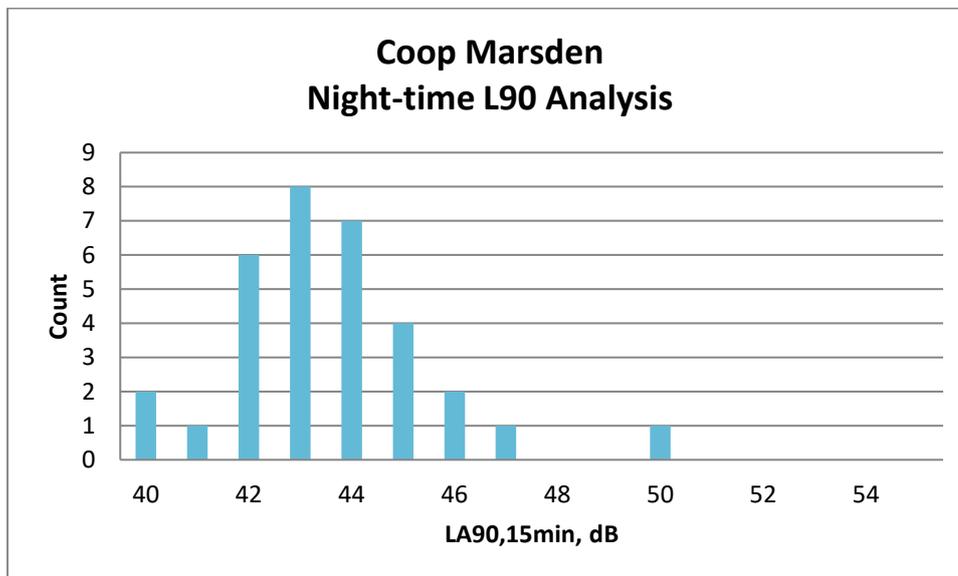


- 4.3. Further statistical analysis has been carried out on the data, and the mean and median values are shown in Table 2 below:

Table 2 Statistical analysis of $L_{A90,15min}$ levels during the daytime period

dB, L_{A90} daytime period	
mean	46
modal	43
median	45

Figure 2 Histogram of night-time L_{A90} background sound pressure levels



4.4. Further statistical analysis has been carried out on the data and the mean and median values are shown in Table 3 below.

Table 3 Statistical analysis of $L_{A90,15min}$ levels during the night-time period

dB, L_{A90} night-time period	
mean	44
modal	43
median	43

4.5. Therefore, the following values are considered representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 42dB L_{A90} during the daytime period; and
- 42dB L_{A90} during the night-time period.

5.0 Plant noise design criteria

National Planning Policy Framework

- 5.1. A new edition of the NPPF was published in December 2023 and came into effect immediately. The original National Planning Policy Framework (NPPF¹) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The December 2023 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2023 edition.
- 5.2. Paragraph 180 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability."*
- 5.3. The NPPF goes on to state in Paragraph 191:
- "planning policies and decisions should ...*
- a) *Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and quality of life;*
 - b) *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason ...*
- 5.4. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE²).
- 5.5. Paragraph 2 of the NPPF states that *"planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise."*
- 5.6. Paragraph 12 of the NPPF states that *"The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed"*.

¹ National Planning Policy Framework, DCLG, March 2012

² Noise Policy Statement for England, DEFRA, March 2010

- 5.7. Paragraph 123 states that "Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land".

Kirklees Council

- 5.8. Kirklees Noise Design advice document published in May of 2017 states the following in regards of noise emissions arising from new industrial or commercial uses near to residential premises:

This advice aims to protect the present and future occupiers of residential properties from your new industrial or commercial noise.

Developers should carry out an assessment in accordance with BS4142 to determine the rating level of the new development. It is recommended that during normal daytime hours (0700 to 2300 hours), the BS4142 rating level, measured over 1 hour, should be 5dB below the background (L_{A90}). During the night-time period (2300 to 0700 hours), the BS4142 rating level, measured over 5 minutes should be 5dB below the background (L_{A90}).

The assessment should be carried out at the site boundary or at the nearest noise sensitive premises depending on the circumstances. These noise levels are intended to ensure that existing noise sensitive premises and land which may be used for noise sensitive development in future does not become blighted by noise. It is also intended that the levels will not place too onerous a noise requirement on premises located in the middle of an industrial estate.

To aid regeneration, in certain circumstances a higher rating level may be accepted provided the need is justified.

In addition, the levels specified in Appendix 1 should not be exceeded. These should be calculated assuming windows in noise sensitive premises are open for ventilation.

- 5.9. Kirklees Noise Design advice document also includes a table of the noise levels which should not be exceeded in different spaces within residential premises. The table is presented herein:

Table 4 Table of noise levels that should not be exceeded within different spaces in residential premises according to the advice document by Kirklees Council

Room/Area	L _{Aeq,16h} (07:00-23:00)	L _{Aeq, 8h} (23:00-07:00)	L _{A1, 15min} (23:00 – 07:00)	L _{Amax} (23:00 – 07:00)
Living rooms/studies	35dB	---	---	---
Gardens	55dB	---	---	---
Bedroom	---	30dB	45dB	55dB

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

- 5.10. BS 4142:2014+A1:2019 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014+A1:2019 includes *“sound from fixed plant installations which comprise mechanical and electrical plant and equipment”*.
- 5.11. The procedure contained in BS 4142:2014+A1:2019 is to quantify the *“specific sound level”*, which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07.00 to 23.00 hours, and night-time as 23.00 to 07.00 hours.
- 5.12. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.
- 5.13. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: *“Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.”*
- 5.14. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: *“Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.”*
- 5.15. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:
- *Typically, the greater this difference, the greater the magnitude of the impact.*
 - *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*

- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;*
 - *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.*
- 5.16. The standard does state that “adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.”
- 5.17. The standard goes on to note that: “Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.”
- 5.18. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:
- “An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.”
- 5.19. BS 4142:2014+A1:2019 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Proposed criteria

- 5.20. It is considered appropriate that the cumulative plant noise rating level of proposed plant should be controlled to a level that does not exceed 5dB below the representative L_{A90} background sound level at the nearest residential property. This would result in, at worst, a ‘low impact’ according to BS4142:2014 (depending on the context) and therefore avoid any adverse impact.
- 5.21. The cumulative noise level for the proposed plant at the nearest noise sensitive windows should, therefore, not exceed the limits shown in the Table 5 below:

Table 5 Proposed plant noise rating level at noise sensitive receptors.

Period	Cumulative plant rating level, dB(A)
Daytime (07.00 – 23.00 hours)	37
Night-time (23.00 – 07.00 hours)	37

5.22. The above limits have not been approved by the local authority at this stage.

6.0 Plant noise impact assessment

- 6.1. Plant noise levels at the most affected noise sensitive receptors have been predicted based on the manufacturer's noise data for the proposed equipment.
- 6.2. The predictions are inclusive of the AC installed within an acoustic enclosure providing a minimum 20dB sound reduction and acoustic wall lining around the condenser.
- 6.3. Predictions are inclusive of the following atmospheric attenuator fitted to the basement extract system:

Table 6 Proposed attenuators to plant room louvres

Attenuator	Insertion loss (dB) at octave band centre frequencies (Hz)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Discharge	13	26	40	45	45	45	45	45

- 6.4. It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained. All proposed external plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems. To provide a robust assessment, a 3dB acoustic feature correction as described in BS 4142:2014+A1:2019 for the possible presence of "...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...".
- 6.5. Table 6 summarises the results of the assessment outside the nearest noise-sensitive dwellings. All other nearby receptors benefit from increased distance/screening to the plant such that resulting noise levels will be lower than at the receptors considered. The full calculations are presented in [Appendix E](#):

Table 7 Assessment of plant rating levels

Receptor	Period	Predicted plant rating level at receptor, L_{Aeq} (dB)	Proposed design criterion (dB)	Difference (dB)
R1 (Residential)	Daytime (07.00 – 23.00 hours)	37	37	0
	Night-time (23.00 – 07.00 hours)	36	37	-1
R2 (Residential)	Daytime (07.00 – 23.00 hours)	29	37	-8
	Night-time (23.00 – 07.00 hours)	23	37	-14

6.6. Where possible, uncertainty in the above assessments has been minimised by taking the following steps:

- The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.
- Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method.
- Care was taken to ensure that the measurement positions were representative of the noise climate outside the nearby residential dwellings and not in positions where higher noise levels were present.
- The above guidance is based on a minimum distance of 5m between the proposed plant to the nearest receptors.

6.7. The following should be taken into account during the design of the proposed plant:

- The local authority is anticipated to require details of the proposed plant and a noise impact assessment report as part of the planning application.

7.0 Summary

7.1. Noise Solutions Ltd (NSL) has been commissioned by City Building Engineering Services to provide a noise impact assessment for replacement plant serving an existing Co-operative store located along Peel Street in Marsden, Huddersfield.

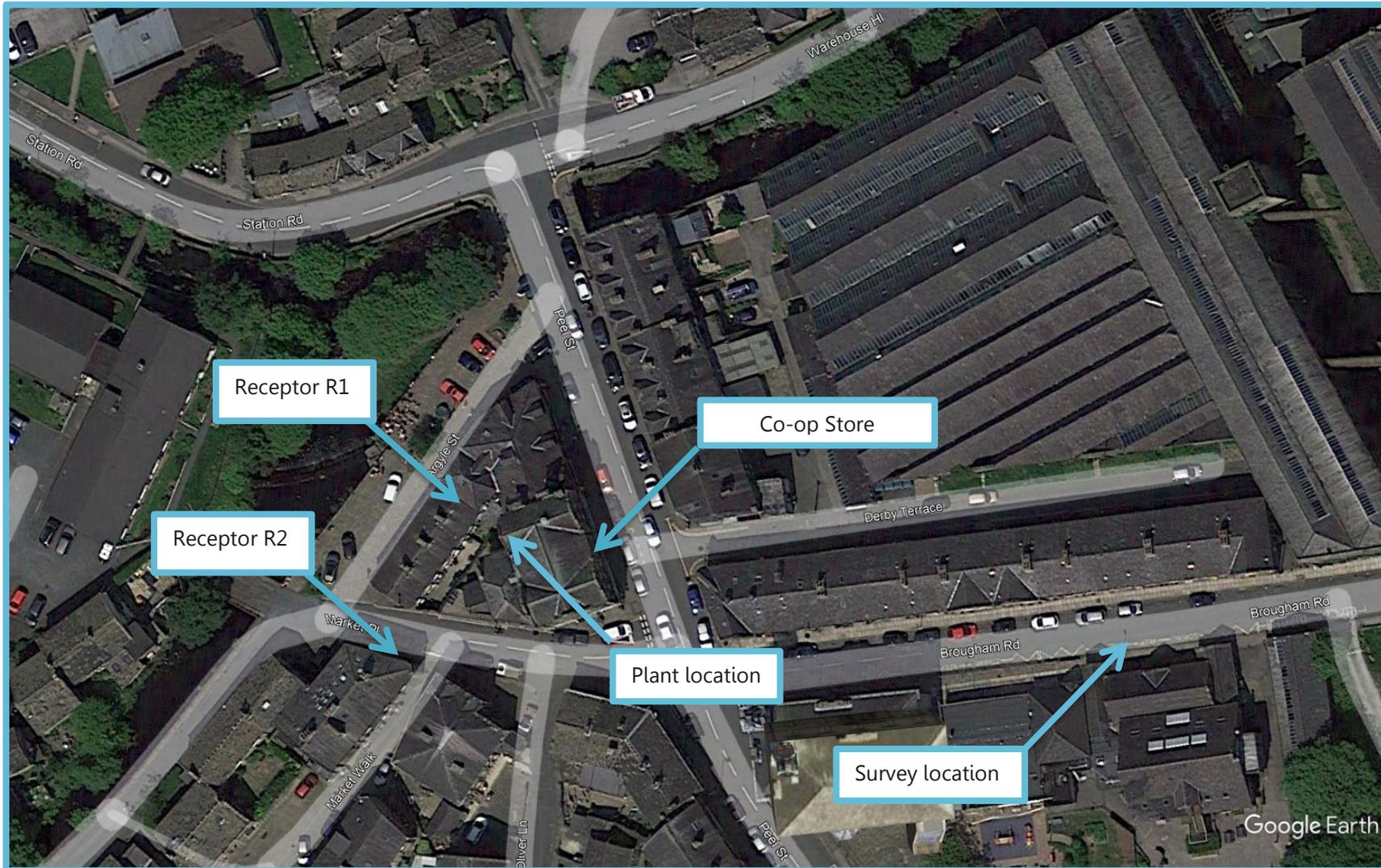
7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at locations representative of the noise climate outside the nearest noise sensitive receptors to the proposed plant area.

-
- 7.3. The cumulative sound rating levels for the proposed plant, including mitigation, have been predicted at the most affected noise sensitive receptor locations and assessed taking into consideration the typical requirements of Kirklees Council. Therefore, noise from the plant proposals should not be a reason for refusal of planning permission.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10}(s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Aerial photograph site showing areas of interest



Appendix C Environmental sound survey

Details of sound surveys

- C.1 Measurements of the existing background sound levels were undertaken between 15.00 hours on Wednesday 14th February and 09.45 hours on Thursday 15th February 2024.
- C.2 The sound level meter was programmed to record the A-weighted L_{eq} , L_{90} , L_{10} and L_{max} noise indices for consecutive 15-minute sample periods for the duration of the noise survey.

Measurement position

- C.3 The representative measurement position was located on a lamp post along Brougham Road (location indicated on the site plan in [Appendix B](#)). This location is approximately representative of the levels of road traffic noise at the closest elevation of the building.
- C.4 In accordance with BS 7445-2:1991 'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use', the measurements were undertaken under free-field conditions.

Equipment

- C.5 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

Environmental noise survey

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 971A / 124660	01/06/2023	1505421-1
Condenser microphone	ACO Pacific 7052E / 81197		
Preamplifier	Svantek SV18A / 130661		
Calibrator	Svantek SV33B / 125546	02/06/2023	1505532-1

Weather Conditions

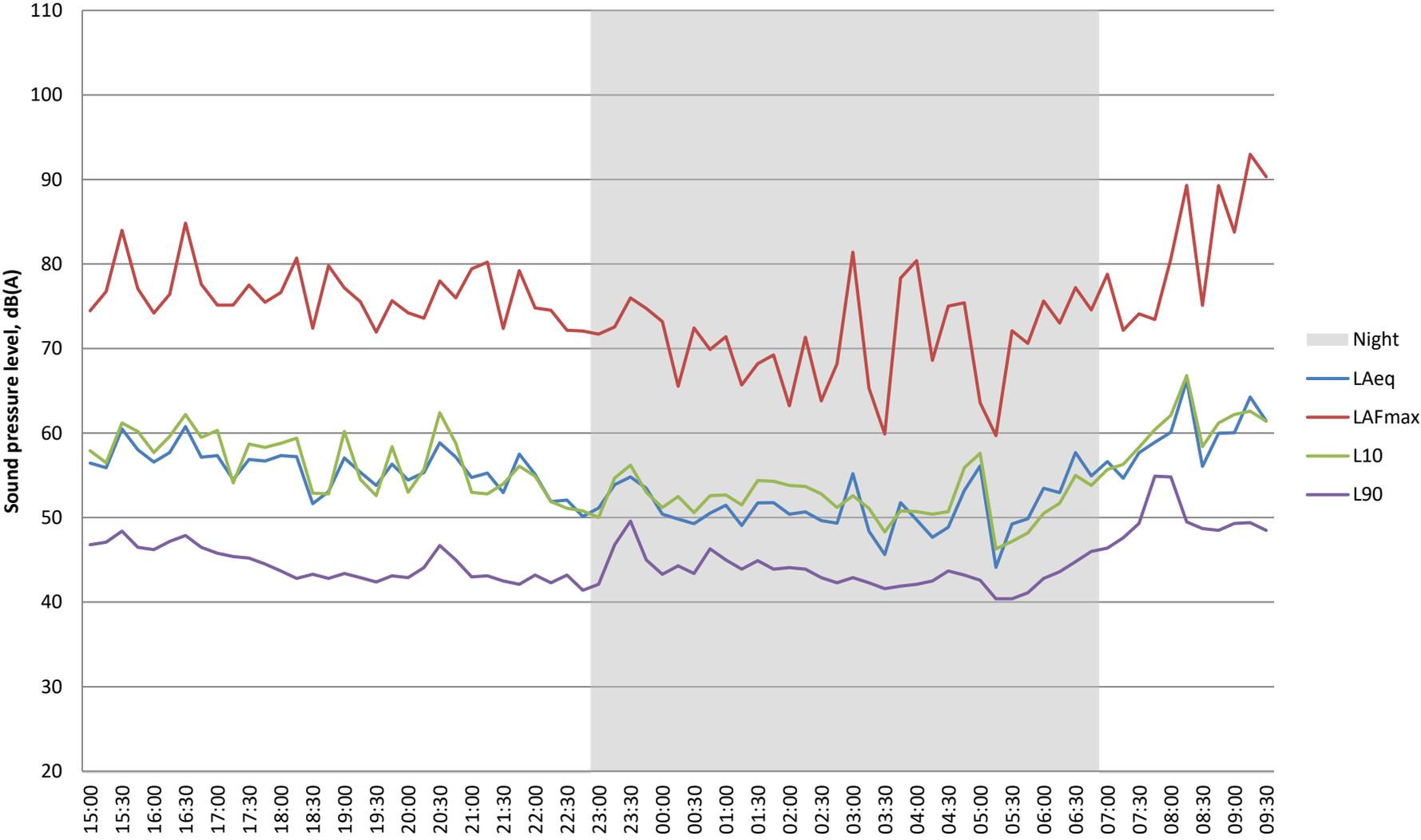
- C.6 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were generally appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions																										
Measurement Location	Date/Time	Description	Beginning of Survey	End of Survey																						
As indicated on Appendix B	15.00 14/2/24 - 09.45 15/2/24	Temperature (°C)	10	14																						
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Cloud Cover</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Symbol</th> <th style="text-align: left;">Scale in oktas (eighths)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">○</td> <td>0 Sky completely clear</td> </tr> <tr> <td style="text-align: center;">◐</td> <td>1</td> </tr> <tr> <td style="text-align: center;">◑</td> <td>2</td> </tr> <tr> <td style="text-align: center;">◒</td> <td>3</td> </tr> <tr> <td style="text-align: center;">◓</td> <td>4 Sky half cloudy</td> </tr> <tr> <td style="text-align: center;">◔</td> <td>5</td> </tr> <tr> <td style="text-align: center;">◕</td> <td>6</td> </tr> <tr> <td style="text-align: center;">◖</td> <td>7</td> </tr> <tr> <td style="text-align: center;">◗</td> <td>8 Sky completely cloudy</td> </tr> <tr> <td style="text-align: center;">⊗</td> <td>(9) Sky obstructed from view</td> </tr> </tbody> </table> </div>		Symbol	Scale in oktas (eighths)	○	0 Sky completely clear	◐	1	◑	2	◒	3	◓	4 Sky half cloudy	◔	5	◕	6	◖	7	◗	8 Sky completely cloudy	⊗	(9) Sky obstructed from view	Precipitation:	Yes	No
		Symbol	Scale in oktas (eighths)																							
		○	0 Sky completely clear																							
		◐	1																							
		◑	2																							
		◒	3																							
		◓	4 Sky half cloudy																							
		◔	5																							
◕	6																									
◖	7																									
◗	8 Sky completely cloudy																									
⊗	(9) Sky obstructed from view																									
Cloud cover (oktas - see guide)	8	6																								
Presence of fog/snow/ice	No	No																								
Presence of damp roads/wet ground	Wet	Wet																								
Wind Speed (m/s)	3	3																								
Wind Direction	South westerly	South westerly																								
Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No																								

Results

- C.7 The results of the environmental survey are considered to be representative of the background sound pressure levels at the façades of the nearest noise sensitive receptors during the quietest times at which the plant will operate. The noise climate during the survey period was dominated by distant road traffic with occasional noise from local road traffic. The results of the survey are presented in a time history graph overleaf.

Coop Marsden Wednesday 14 - Thursday 15 Feb 2024



Appendix D Manufacturer's Noise Data

Plant	Unit/Model	No. of units	Description	Sound power level (dB) at octave band centre frequencies (Hz)								
				63	125	250	500	1000	2000	4000	8000	dBA (dB)
Extract fan	Systemair/Sileo 315	1	Discharge L _w	77	78	72	65	63	61	58	47	70
Condenser	Coolers and Condensers/KFHA 1.4-124CU-EC91.LL.260	1	Sound pressure level at 10m									51.6
AC1	Mitsubishi/PUZ-ZM250YKA	1	Sound pressure level at 1m									62

Appendix E Plant noise calculations

Receptor R1 – Day

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Screening	BS4142 FEATURE	Rating Level at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	Correction (dB)	
Gas Cooler	51.6	L _w	3.5	-19	0	0	+3	36
AC1	62	1	6	-16	3	-20	+3	32
Extract	See separate calculation						+3	19
Combined rating level at receptor								37

Receptor R1 – Night

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Screening	BS4142 FEATURE	Rating Level at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	Correction (dB)	
Gas Cooler	51.6	L _w	3.5	-19	0	0	+3	36
Extract	See separate calculation						+3	19
Combined rating level at receptor								36

Receptor R2 – Day

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Screening	BS4142 FEATURE	Rating Level at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	Correction (dB)	
Gas Cooler	51.6	L _w	15	-32	0	0	+3	23
AC1	62	1	10	-20	3	-20	+3	28
Extract	See separate calculation						+3	9
Combined rating level at receptor								29

Receptor R2 – Night

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Screening	BS4142 FEATURE	Rating Level at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	Correction (dB)	
Gas Cooler	51.6	L _w	3.5	-19	0	0	+3	23
Extract	See separate calculation						+3	9
Combined rating level at receptor								23

Extract fan



NSL Ref: **88479**
Project **Coop Marsden**

Compiled by:	DMB	02/07/2024
--------------	-----	------------

Plant Ref
Plant Description **Emergency / Vent extract
Systemair Sileo 315**

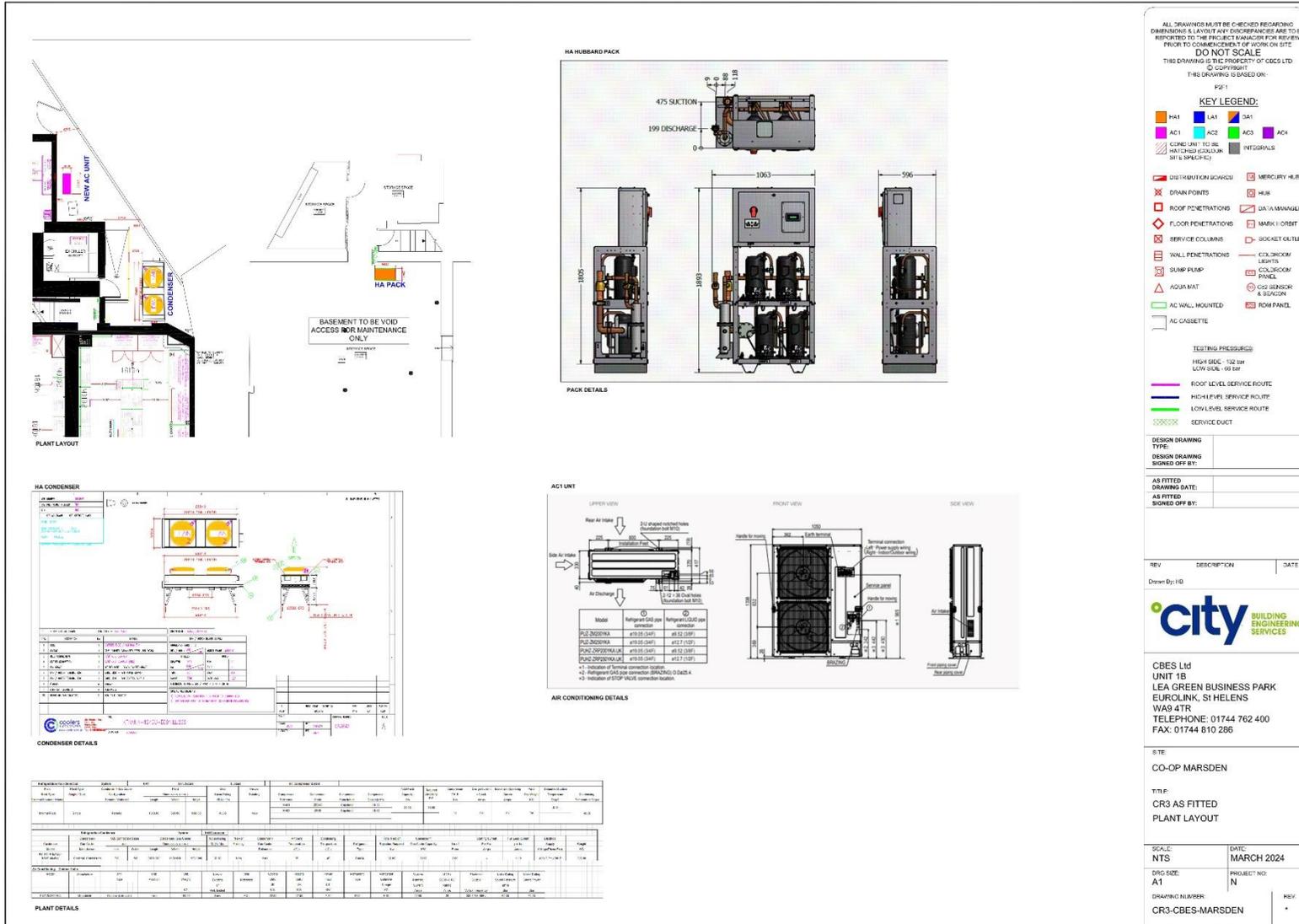
Description
Source noise level (unattenuated)
System losses
Atmospheric side attenuator
Sound power level leaving terminal

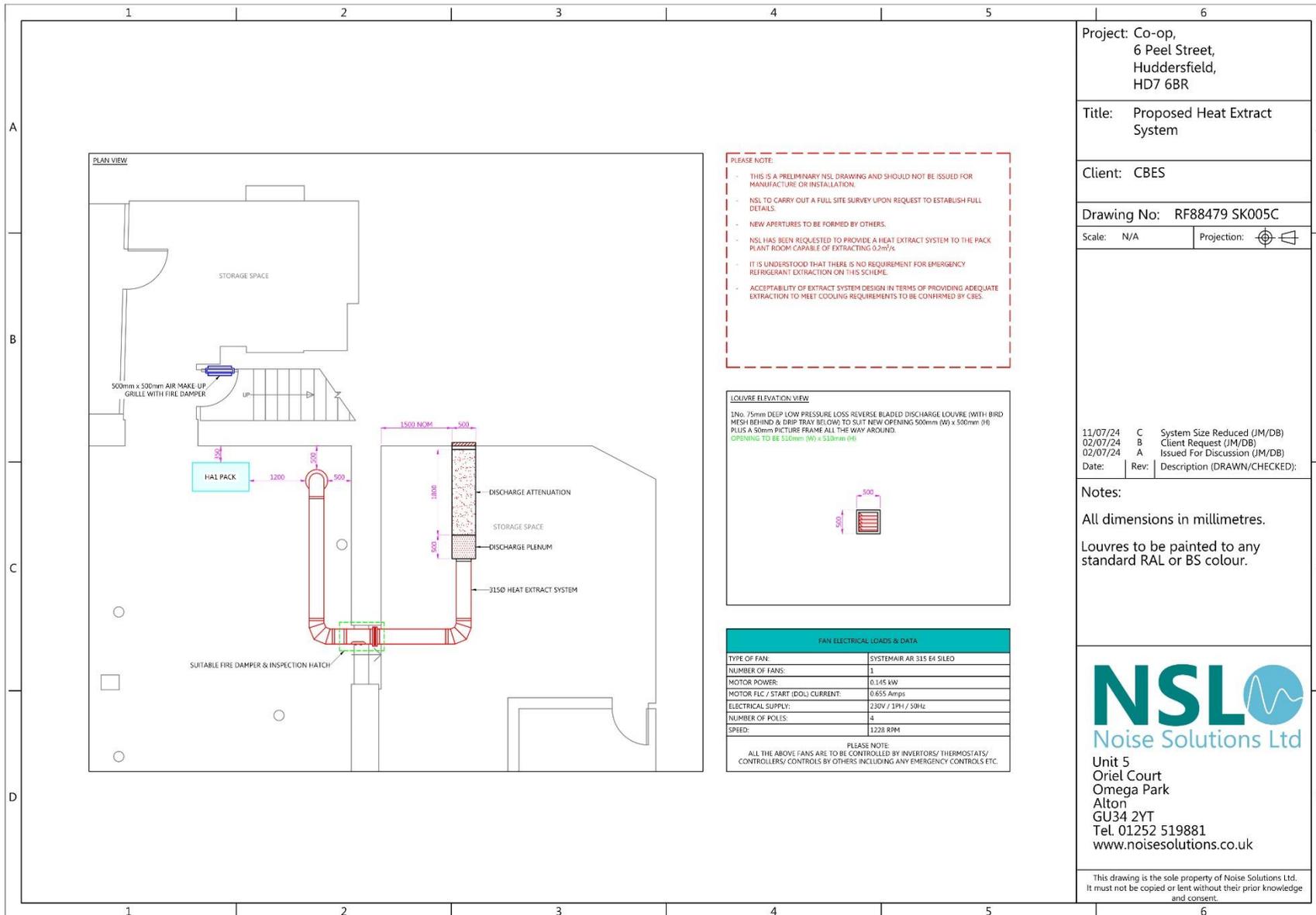
Notes.	Sound level (dB) at octave band centre frequencies (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
In-duct L _w	77	78	72	65	63	61	58	47	70
	-6	-2	0	-1	-3	-5	-7	-7	
I.L.	-13	-26	-40	-45	-45	-45	-45	-45	
	58	50	32	19	15	11	6	-5	36

Receptor R1	V angle	H angle										
Directivity correction	45	45	800 x 800 (45,45)	0	1	1	2	2	2	2	2	
Distance correction	4.5	m	4.5 m	-21	-21	-21	-21	-21	-21	-21	-21	
Screening correction	Screened:		δ=	-4.5	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R1			L_p	37	30	12	0	-4	-8	-13	-24	16

Receptor R2	V angle	H angle										
Directivity correction	0	0	800 x 800 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	15	m	15 m	-32	-32	-32	-32	-32	-32	-32	-32	
Screening correction	Screened:		δ=	-15	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R2			L_p	27	20	3	-9	-12	-15	-20	-31	6

Appendix F Plant Layout



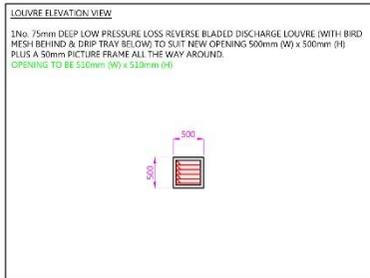


PLEASE NOTE:

- THIS IS A PRELIMINARY NSL DRAWING AND SHOULD NOT BE ISSUED FOR MANUFACTURE OR INSTALLATION.
- NSL TO CARRY OUT A FULL SITE SURVEY UPON REQUEST TO ESTABLISH FULL DETAILS.
- NEW APERTURES TO BE FORMED BY OTHERS.
- NSL HAS BEEN REQUESTED TO PROVIDE A HEAT EXTRACT SYSTEM TO THE PACK PLANT ROOM CAPABLE OF EXTRACTING 0.2m³/s.

IT IS UNDERSTOOD THAT THERE IS NO REQUIREMENT FOR EMERGENCY REFRIGERANT EXTRACTION ON THIS SCHEME.

ACCEPTABILITY OF EXTRACT SYSTEM DESIGN IN TERMS OF PROVIDING ADEQUATE EXTRACTION TO MEET COOLING REQUIREMENTS TO BE CONFIRMED BY CBES.



FAN ELECTRICAL LOADS & DATA	
TYPE OF FAN:	SYSTEMAIR AR 315 E4 SILEO
NUMBER OF FANS:	1
MOTOR POWER:	0.145 kW
MOTOR FLC / START (DOL) CURRENT:	0.655 Amps
ELECTRICAL SUPPLY:	230V / 1PH / 50Hz
NUMBER OF POLES:	4
SPEED:	1228 RPM

PLEASE NOTE:
 ALL THE ABOVE FANS ARE TO BE CONTROLLED BY INVERTORS/ THERMOSTATS/ CONTROLLERS/ CONTROLS BY OTHERS INCLUDING ANY EMERGENCY CONTROLS ETC.

Project: Co-op,
 6 Peel Street,
 Huddersfield,
 HD7 6BR

Title: Proposed Heat Extract System

Client: CBES

Drawing No: RF88479 SK005C

Scale: N/A Projection:

11/07/24 C System Size Reduced (JM/DB)
 02/07/24 B Client Request (JM/DB)
 02/07/24 A Issued For Discussion (JM/DB)
 Date: Rev: Description (DRAWN/CHECKED):

Notes:
 All dimensions in millimetres.
 Louvres to be painted to any standard RAL or BS colour.

Unit 5
 Oriel Court
 Omega Park
 Alton
 GU34 2YT
 Tel. 01252 519881
 www.noisesolutions.co.uk

This drawing is the sole property of Noise Solutions Ltd.
 It must not be copied or lent without their prior knowledge and consent.