The Co-operative
Test Road
Sompting
BN15 0EN

Plant Noise Impact Assessment

On behalf of

abgroup.com

Project Reference: 87498| Revision: - | Date: 11th November 2020

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Document Information

Project Name	:	**The Co-operative, Test Road, Sompting, BN15 0EN**
Project Reference	:	**87498**
Report Title	:	**Plant Noise Impact Assessment**
Doc Reference	:	**87498/PNG**
Date	:	**11th November 2020**

	Name	Qualifications	Initials	Date
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For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/ Approved

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Executive Summary

Noise Solutions Limited has been appointed to provide a noise impact assessment of replacement plant to be installed at the existing Co-operative store located at Test Road, Sompting.

Replacement plant will be installed within the service yard to the rear of the store.

The assessment shows that, with the proposed acoustic wall lining, noise from the plant will comply with the local authority's usual requirements and should therefore be acceptable to them.

1.0 Introduction

1.1. Noise Solutions Ltd (NSL) has been commissioned to provide a noise impact assessment of replacement plant proposed for the existing Co-operative store on Test Road, Sompting.

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. The noise level from the replacement plant has been predicted at the nearest noise-sensitive receptor and assessed against local and national guidance and recognised standards.

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 on the ground floor of a mixed-use building at 59 Test Road, Sompting, in a predominantly residential area. There are residential flats on two storeys above the store. Plant is located at the south (rear) of the store.

2.2. An aerial photograph showing the site, plant location, nearest houses and the noise monitoring location used in this assessment is presented in **Appendix B**.

2.3. New plant is proposed to be located at the rear of the store, in the same location as the existing equipment serving the store. Plant is to comprise an air conditioning (AC) unit and a refrigeration pack and gas cooler. The AC unit will run only when the store is open; the refrigeration plant will operate at all times, but at reduced load when the store is closed.

2.4. Acoustic wall lining is to be installed behind the AC unit to control acoustic reflections to the receptors.

2.5. The proposed plant layout is shown in **Appendix D**. Plant noise data is given in **Appendix E**.

3.0 Nearest noise-sensitive receptors

3.1. The nearest noise-sensitive residential premises to the new plant are the flats above the store (Receptor R1). The nearest windows are approximately 6m from the plant but are set back from the façade where the plant is located and are therefore screened from the plant by the layout of the building.

3.2. The nearest windows with line-of-sight to the plant are the rear windows of the nearest houses on Hamble Drive to the south east of the store (R2). These are approximately 18m from the plant.

4.0 Existing noise climate

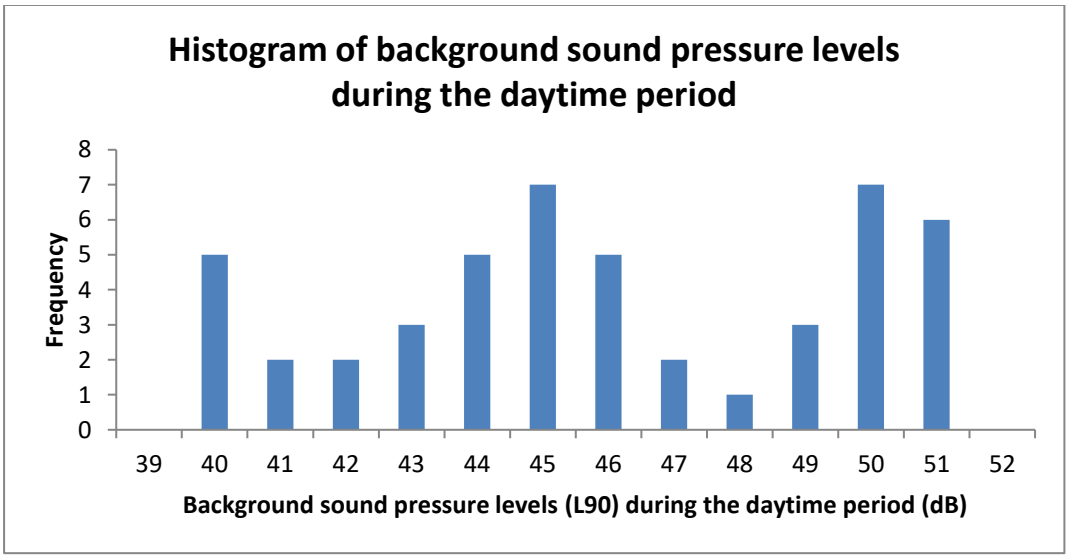
4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.

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)			
	$L_{Aeq(15mins)}$	$L_{Amax(15mins)}$	$L_{A10(15mins)}$	$L_{A90(15mins)}$
Daytime (07.00 – 23.00 hours)	44-61	56-85	46-65	40-51
Night-time (23.00 – 07.00 hours)	39-59	50-81	41-60	37-49

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



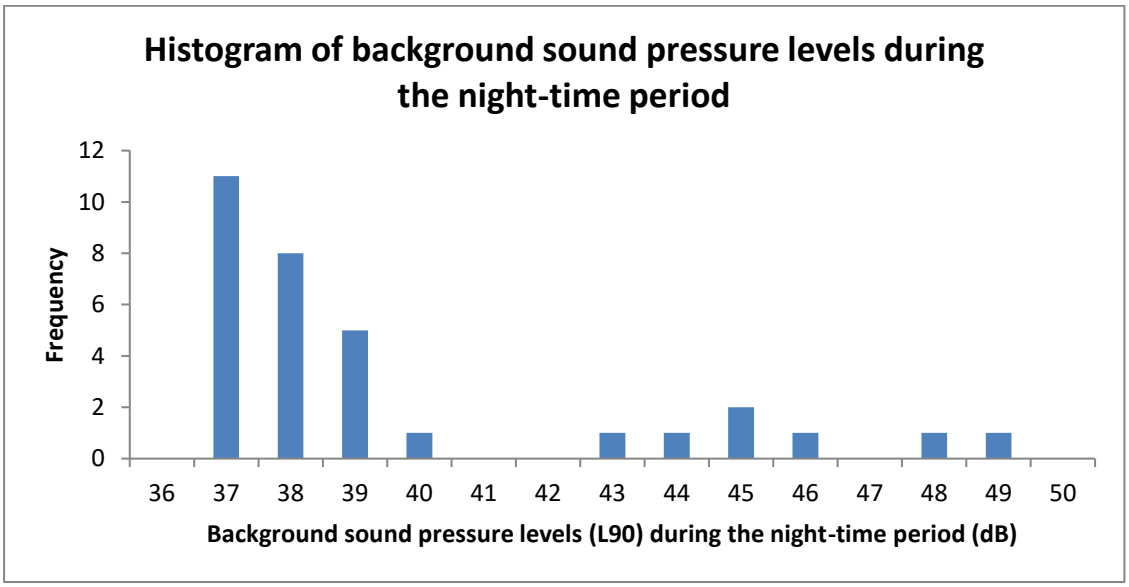
4.3. Further statistical analysis has been carried out on the data, and the mean and median values are shown in table 2 below.

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

dB, L_{A90} daytime period	
Mean	46
Median	46
Mode	45

4.4. From the histogram analysis, 42 dB has been selected to be a robust representation of the background noise level during the daytime period.

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



4.5. 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} daytime period	
Mean	40
Median	38
Mode	37

4.6. Again from the histogram analysis, 37 dB has been chosen to be representative of the background sound level during the night-time period.

4.7. 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
- 37dB L_{A90} during the night-time period

5.0 Plant noise design criteria

Adur District Council

5.1. Policy 34 *Pollution and Contamination* in the Adur Local Plan 2017 (adopted December 2017) states that "where appropriate ... noise assessments will be required in conjunction with development proposals". Reference is also made to the Planning Noise Advice Document: Sussex, July 2015.

5.2. The *Planning Noise Advice Document for Sussex* contains the following paragraph in relation to Industrial and Commercial Noise Sources.

> *The starting point for designing any industrial/ commercial development should be to minimise noise "as far as reasonably practicable". The rating level of the plant/process, when measured in accordance with BS4142:2014, should, where practicable, be no greater than the existing background levels when measured in accordance with BS4142:2014. There may be instances, for specific sites, where a rating level below background is deemed appropriate. This can be determined through prior discussion with the Local Planning Authority or Local Environmental Health Department. For example, a rating level of 10 dBA below background may be required in certain instances if there are specific concerns such as the potential for noise creep. It is considered that meeting these criteria would avoid adverse noise impacts, in the interests of ensuring a good standard of amenity and protecting human health. Where these criteria are not attainable, the noise report should explain why, and how best practicable means will be implemented to control noise in order to satisfy the LPA that the development is acceptable*

5.3. Since the proposed plant is to replace existing plant at the store, it is reasonable to assume that there is a negligible risk of noise creep and therefore meeting the normal criteria will be acceptable.

National Planning Policy Framework

5.4. A new edition of NPPF was published in February 2019 and came into effect immediately. The original National Planning Policy Framework (NPPF[1]) was published in March 2012, with a revision in July 2018 - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The 2019 revised edition contains no new directions or guidance with respect to noise, and hence, all previous references remain extant. The paragraph references quoted below relate to the February 2019 edition.

[1] National Planning Policy Framework, DCLG, March 2012

5.5. Paragraph 170 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing both 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 stability."*

5.6. The NPPF goes on to state in Paragraph 180:

"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 ...

5.7. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE[2]).

5.8. 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."

5.9. 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".

5.10. Paragraph 117 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".*

[2] Noise Policy Statement for England, DEFRA, March 2010

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

5.11. BS 4142:2014 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes *"sound from fixed plant installations which comprise mechanical and electrical plant and equipment"*.

5.12. The procedure contained in BS 4142:2014 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.

5.13. 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.

5.14. 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."*

5.15. 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."*

5.16. 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.*

5.17. 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.*"

5.18. 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."*

5.19. 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."

5.20. BS 4142:2014 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.

Summary of criteria

5.21. In accordance with the guidance in the Sussex Planning Noise Advice Document, it is proposed that the rating noise level of the new plant, at the nearest noise-sensitive receptors, is no higher than the existing representative background sound level. The proposed plant noise limits are shown in Table 4.

Table 4 Proposed plant noise emissions level limits at nearest receptor

Period	Cumulative plant rating noise level, dB(A)
Daytime (07.00 – 23.00 hours)	40
Night-time (23.00 – 07.00 hours)	37

6.0 Plant noise assessment

6.1. The plant noise level has been predicted at the nearest noise-sensitive receptors. Predictions include attenuation due to distance between the plant and the receptor and, where appropriate, the effects of screening and acoustic reflections and the proposed acoustic wall lining.

6.2. 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 plant will be inverter driven and,

therefore, will gently ramp up and down depending on the demands on the various systems. However, a penalty of 3dB as described in BS 4142:2014 has been applied for the possible presence of "*...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...".*

6.3. A summary of the predicted noise levels is shown in Table 5. Full calculations are given in **Appendix F**.

Table 5 Plant noise assessment – external rating level

Receptor	Period	Plant rating level at receptor, dB(A)	Proposed criterion, dB(A)	Excess
R1	Daytime (07.00 – 23.00 hours)	41	42	-1
	Night-time (23.00 – 07.00 hours)	28	37	-9
R2	Daytime (07.00 – 23.00 hours)	42	42	0
	Night-time (23.00 – 07.00 hours)	29	37	-8

6.4. The assessment shows that the rating noise level at the nearest residential premises complies with the proposed criteria.

Uncertainties and context

6.5. 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.

6.6. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessment is undertaken at the most affected residential windows. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.

7.0 Summary

7.1. Noise Solutions Ltd (NSL) has been commissioned to provide guidance a noise impact assessment of replacement plant serving the Co-operative store on Test Road, Sompting.

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

7.3. The assessment shows that the rating noise level from the proposed plant will be no higher than the existing representative background sound level, in accordance with Adur District Council's Local Plan and the Sussex-wide Planning Noise Advice Document, and should therefore be acceptable to the local authority.

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 s1 and s2 is given by 20 log10 (s1/s2). 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 20μPa. 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 Leq 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 exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B Aerial photograph site showing areas of interest



Appendix C Environmental and plant surveys

Details of environmental sound surveys

C.1 Measurements of the existing background sound levels were undertaken from 15:00 hours on Thursday 5th April to 11:00 hours on Friday 6th April 2018.

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 fifteen-minute sample periods for the duration of the survey.

Measurement position

C.3 The sound level meter was positioned on lamppost on Hamble Road. The approximate location of the microphone is indicated on the plan in Appendix B. In accordance with BS 7445-2:21991 *'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.

C.4 The location was chosen so that noise measurements were not affected by the existing plant at the Co-operative store.

Equipment

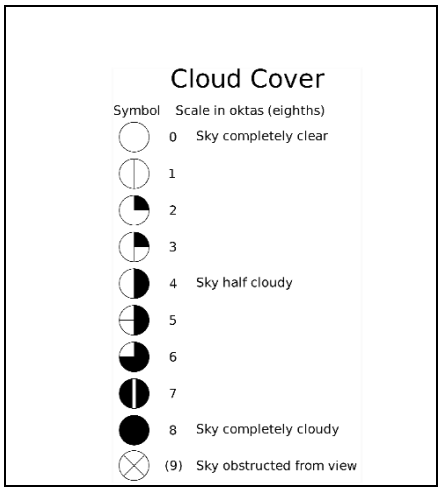
C.5 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

Environmental noise survey

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 949 / 8195	24/10/2016	1610560
Condenser microphone	MCE212/ 22267		
Preamplifier	Svantek SV12L / 7557		
Calibrator	Svantek SV 40A / 10843	06/10/2016	1610518

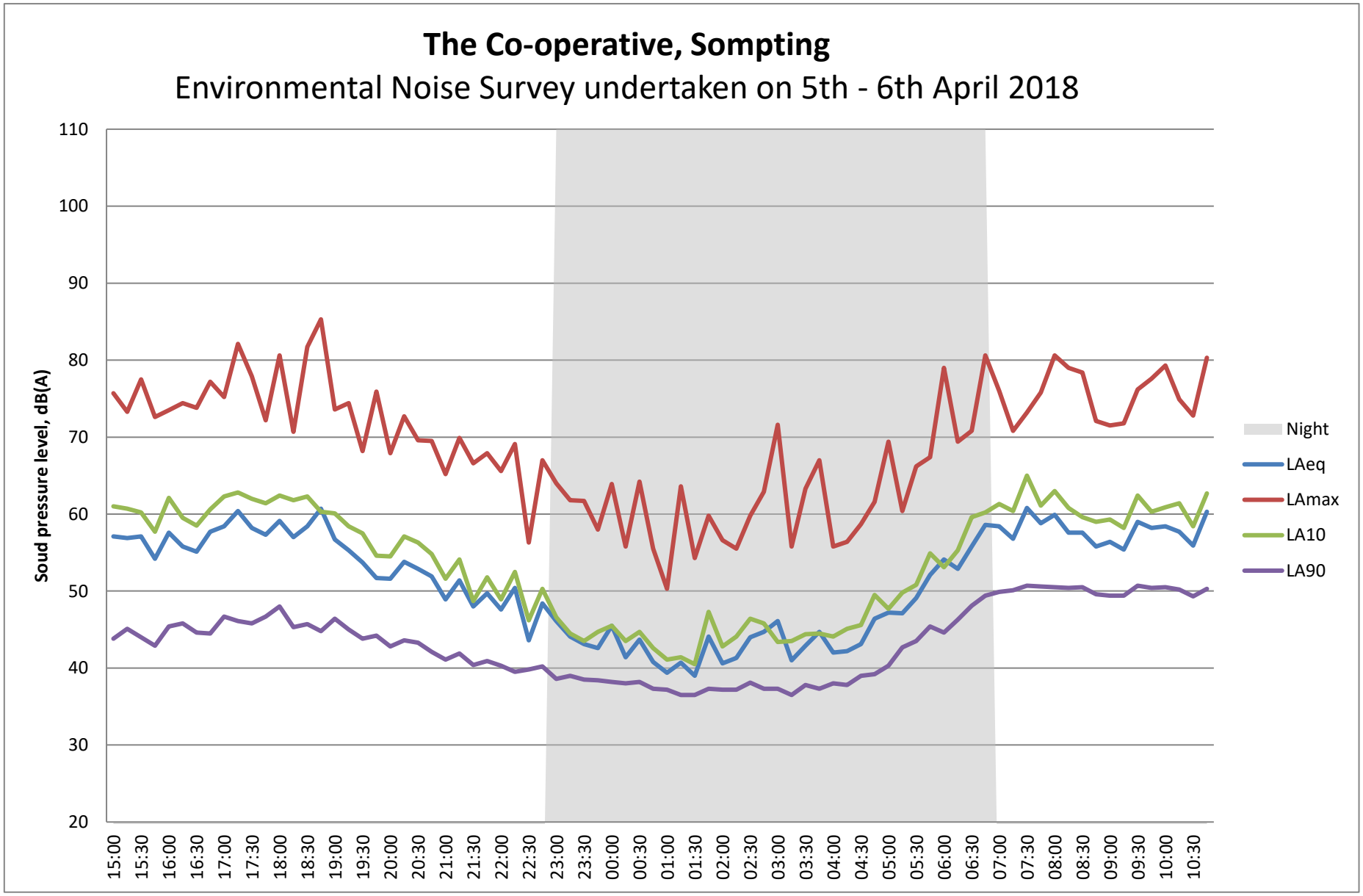
Weather Conditions

C.6 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were 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 5 Apr 18-11.00 6 Apr 18	Temperature	10	11
		Precipitation:	No	No
		Cloud cover (oktas - see guide)	1	4
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	No	No
		Wind Speed (m/s)	6	8
		Wind Direction	SSW	ESE
		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 local road traffic, particularly along Western Road. The results of the survey are presented in a time history graph overleaf.


The Co-operative, Sompting
Environmental Noise Survey undertaken on 5th - 6th April 2018
Soud pressure level, dB(A)
110
100
90
80
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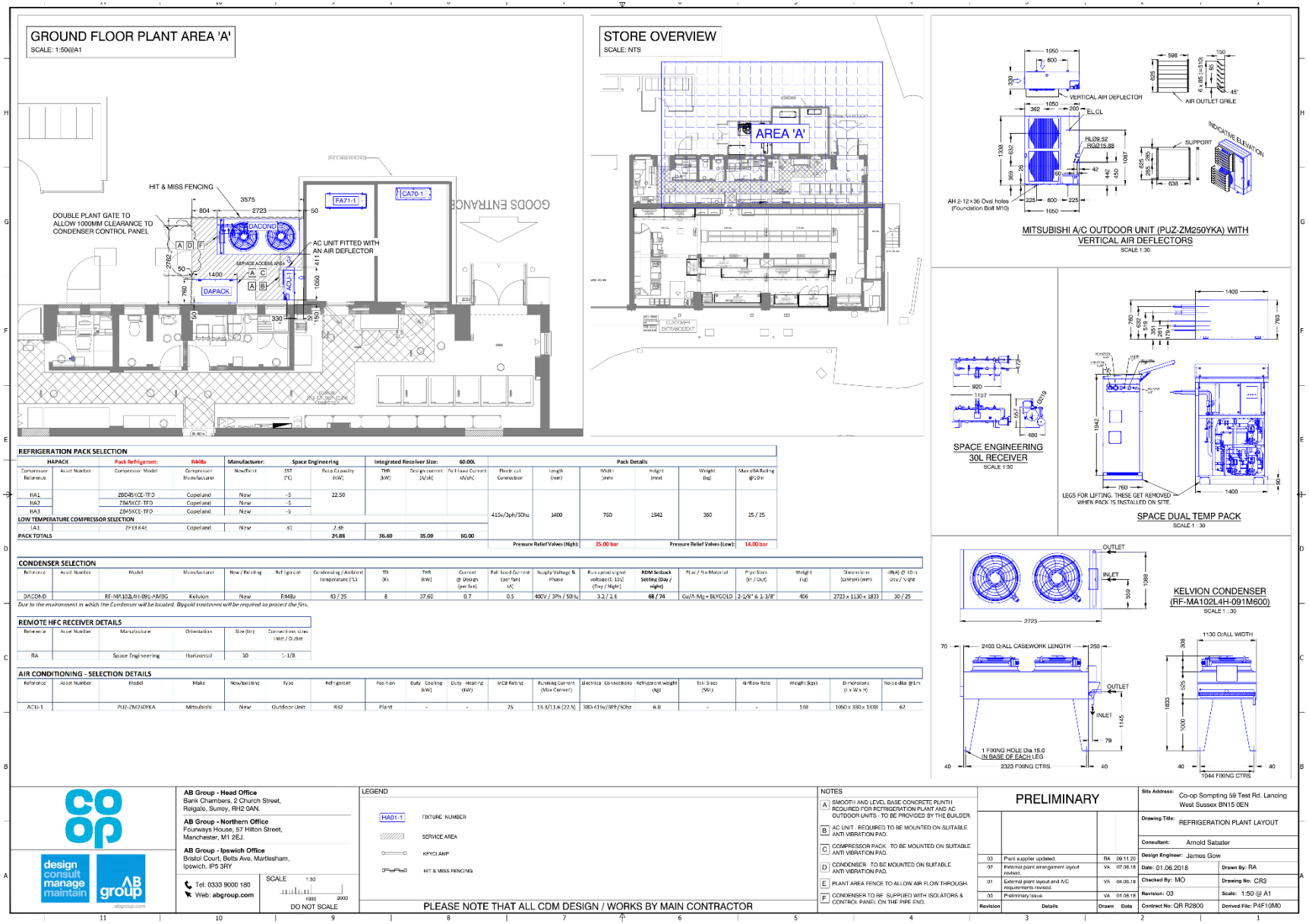
Night
LAeq
LAmax
LA10
LA90

Appendix D Plant layout plan



REFRIGERATION PACK SELECTION

HAPACK	Pack Refrigerant:	R448a	Manufacturer:	Space Engineering	Integrated Receiver Size:	60.00L	Pack Details					
Compressor Reference	Asset Number	Compressor Model	Compressor Manufacturer	New/Exist	SST (°C)	Pwr Capacity (kW)	THR (kW)	Design current (A/ph)	Full load Current (A/ph)	Electrical Connection	Length (mm)	Width (mm)	Height (mm)	Weight (kg)	Max dBA Rating @1.0m
HA1		ZB045ICE-TFD	Copeland	New	-5	22.50				415v/3ph/50hz	1400	760	1942	360	25 / 25
HA2		ZB45KCE-TFD	Copeland	New	-5										
HA3		ZB45KCE-TFD	Copeland	New	-5										
LOW TEMPERATURE COMPRESSOR SELECTION															
LA1		ZF13 K4E	Copeland	New	-31	2.38									
PACK TOTALS						24.88	36.69	35.00	60.00						
										Pressure Relief Valves (High):	25.00 bar		Pressure Relief Valves (Low):	14.00 bar	

CONDENSER SELECTION

Reference	Asset Number	Model	Manufacturer	New / Existing	Refrigerant	Condensing / Ambient Temperature (°C)	TD (K)	THR (kW)	Current @ Design (per fan)	Full load Current (per fan) (A)	Supply Voltage & Phase	Fan speed signal voltage (0-10V) (Day / Night)	RDM Setback Setting (Day / night)	Pipe / Fin Material	Pipe Sizes (In / Out)	Weight (kg)	Dimensions (LxWxH) (mm)	dB(A) @ 10m Day / Night
DACOND		RF-MA102L4H-091-AM3G	Kelvion	New	R448a	43 / 25	8	37.60	0.7	0.5	400V / 3Ph / 50Hz	3.2 / 2.6	68 / 74	Cu/Al Mg + BLYGOLD	2-1/8" & 1-3/8"	406	2723 x 1130 x 1833	30 / 25

Due to the environment in which the Condenser will be located, Blygold treatment will be required to protect the fins.

REMOTE HFC RECEIVER DETAILS

Reference	Asset Number	Manufacturer	Orientation	Size (ltr)	Connections sizes Inlet / Outlet
RA		Space Engineering	Horizontal	30	1-1/8

AIR CONDITIONING - SELECTION DETAILS

Reference	Asset Number	Model	Make	New/existing	Type	Refrigerant	Position	Duty Cooling (kW)	Duty Heating (kW)	MCA Rating	Running Current (Max Current)	Electrics Connections	Refrigerant weight (kg)	Tail Sizes (NB)	Airflow Rate	Weight (kgs)	Dimensions (l x W x H)	Noise data @1m
ACU-1		PUZ-ZM250YKA	Mitsubishi	New	Outdoor Unit	R32	Plant	-	-	25	13.8/13.6 (27.5)	380-415v/3Ph/50hz	6.8	-	-	138	1050 x 330 x 1338	67

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SCALE 1:50 1000 2000 DO NOT SCALE

LEGEND
HA01-1 FIXTURE NUMBER
SERVICE AREA
KEYCLAMP
HIT & MISS FENCING

PLEASE NOTE THAT ALL CDM DESIGN / WORKS BY MAIN CONTRACTOR

NOTES
A SMOOTH AND LEVEL BASE CONCRETE PLINTH REQUIRED FOR REFRIGERATION PLANT AND AC OUTDOOR UNITS - TO BE PROVIDED BY THE BUILDER.
B AC UNIT - REQUIRED TO BE MOUNTED ON SUITABLE ANTI VIBRATION PAD.
C COMPRESSOR PACK - TO BE MOUNTED ON SUITABLE ANTI VIBRATION PAD.
D CONDENSER - TO BE MOUNTED ON SUITABLE ANTI VIBRATION PAD.
E PLANT AREA FENCE TO ALLOW AIR FLOW THROUGH.
F CONDENSER TO BE SUPPLIED WITH ISOLATORS & CONTROL PANEL ON THE PIPE END.

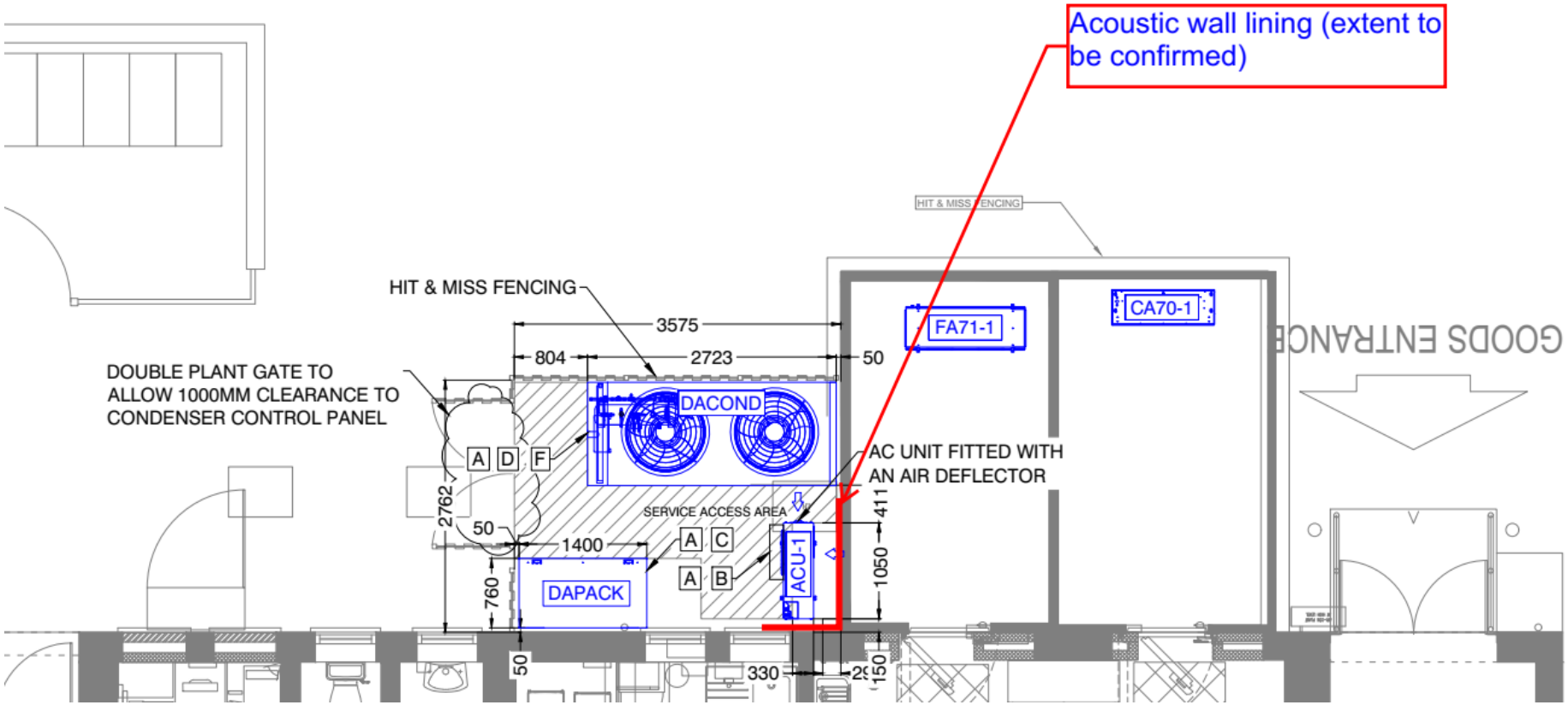
PRELIMINARY

Revision	Details	Drawn	Date
03	Plant supplier updated.	RA	09.11.20
02	External plant arrangement layout revised.	VA	07.06.18
01	External plant layout and A/C requirements revised.	VA	04.06.18
00	Preliminary issue.	VA	01.06.18

Site Address: Co-op Sompting 59 Test Rd. Lancing West Sussex BN15 0EN
Drawing Title: REFRIGERATION PLANT LAYOUT
Consultant: Arnold Sabater
Design Engineer: James Gow
Date: 01.06.2018 Drawn By: RA
Checked By: MO Drawing No: CR3
Revision: 03 Scale: 1:50 @ A1
Contract No: QR R2800 Derived File: P4F10M0

GROUND FLOOR PLANT AREA 'A'

SCALE: 1:50@A1



Appendix E Plant noise data

Plant Ref	Manufacturer / Model	Operating Hours	Sound pressure level
ACU-1	Mitsubishi PUZ-ZM250YKA	Store opening hours only	64dBA at 1m*
DACOND Gas Cooler	Kelvion RF-MA102L4H-091-AMBG	Day	30dBA at 10m
		Night	25dBA at 10m
HAPACK Pack	Space Engineering	Day and night	25dBA at 10m

**Including +2dB correction for air deflector*

Appendix F Plant noise calculations

Receptor R1 - Day

Plant item	Source Sound level (dBA)	Distance		Directivity Correction (dB)	Screening (dB)	BS 4142:2014 feature correction	Cumulative plant rating level at façade L_{Aeq} (dB)
		Distance to Receptor (m)	Correction (dB)				
ACU-1	64 @ 1m	6	-16	0*	-10	3	41
Gas Cooler	30 @ 10m	6	4	3	-10	3	30
Pack	25 @ 10m	6	4	3	-10	3	25
				Cumulative Rating Level			41

Receptor R1 - Night

Plant item	Source Sound level (dBA)	Distance		Directivity Correction (dB)	Screening (dB)	BS 4142:2014 feature correction	Cumulative plant rating level at façade L_{Aeq} (dB)
		Distance to Receptor (m)	Correction (dB)				
Gas Cooler	25 @ 10m	6	4	3	-10	3	25
Pack	25 @ 10m	6	4	3	-10	3	25
				Cumulative Rating Level			28

**Acoustic reflections from walls controlled by wall lining*

Receptor R2 - Day

Plant item	Source Sound level (dBA)	Distance		Directivity Correction (dB)	Screening (dB)	BS 4142:2014 feature correction	Cumulative plant rating level at façade L_{Aeq} (dB)
		Distance to Receptor (m)	Correction (dB)				
ACU-1	64 @ 1m	18	-25	0*	0	3	42
Gas Cooler	30 @ 10m	18	-5	3	0	3	31
Pack	25 @ 10m	18	-5	3	0	3	26
				Cumulative Rating Level			42

Receptor R2 - Night

Plant item	Source Sound level (dBA)	Distance		Directivity Correction (dB)	Screening (dB)	BS 4142:2014 feature correction	Cumulative plant rating level at façade L_{Aeq} (dB)
		Distance to Receptor (m)	Correction (dB)				
Gas Cooler	25 @ 10m	18	-5	3	0	3	26
Pack	25 @ 10m	18	-5	3	0	3	26
				Cumulative Rating Level			29

**Acoustic reflections from walls controlled by wall lining*