

SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report

**Discharge of Conditions.
Blue Bell Inn, Desford
Noise Assessment Update**

Prepared by
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Date 9th July 2024
Project No 2321871

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This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

1.0 Introduction

1.1 Sharps Redmore has been instructed to undertake a noise assessment in order to comply with, and enable discharge of, planning conditions as part of a change of use application for The Blue Bell Inn, High Street, Desford, to a food store. The scheme was considered by Hinckley and Bosworth BC in May 2024 (Ref: 23/00711).

1.2 Conditions were suggested including those relevant to noise and these are shown in italics below:

8. Deliveries to/ from the site and car parking shall be undertaken in accordance with the Car Park & Delivery Management Plan (Reference: ADL/AM/5428/26A, dated January 2024).

Reason: To reduce the possibility of the proposed development leading to large vehicles loading, unloading and turning in the highway, in the interests of highway safety and in accordance with the National Planning Policy Framework (December 2023).

17. Development shall not begin until a scheme for protecting nearby dwellings from noise from the proposed mechanical plant has been submitted to and approved by the Local Planning Authority. All works which form part of the scheme shall be completed before the permitted development first comes into use.

Reason: To ensure that the development does not cause unacceptable levels of noise and disturbance to neighbouring dwellings in accordance with Policy DM10 of the Site Allocations and Development Management Policies Development Plan Document (2016).

1.3 The purpose of this report is to assess the impact of noise from environmental noise. In particular in terms of new plant that may be associated with the change of use and deliveries.

1.4 The report is structured as follows:

- Section 2.0 – Assessment criteria;
- Section 3.0 – Noise Survey Details;
- Section 4.0 – Noise Assessment;
- Section 5.0 - Summary and Conclusions

1.5 A guide to the acoustic terminology used within this report included in Appendix B.

2.0 Assessment Criteria

- 2.1 Objective guidance on the assessment of noise from plant and machinery can be found in BS 4142:2014 +A1:2019 which describes a method for rating and assessing sound of an industrial and/or commercial nature according to the following summary process:
- i) Determine the background sound levels, in terms of L_{A90} , at the receptor locations of interest.
 - ii) Determine the specific sound level of the source being assessed, in terms of L_{AeqT} level ($T = 1$ hour for day or 15 minutes at night), at the receptor locations.
 - iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent or other characteristic which attract attention.
 - iv) Compare the rating sound level against the background noise level; the greater the difference between the two, the higher the likelihood of complaints of the noise.
 - v) Differences (rating – background) of around +10 dB is likely to be an indication of significant adverse impact (SOAEL) depending on context; a difference of +5 dB is likely to be an indication of adverse impact, depending on context. 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 upon context.
- 2.2 The general intent of the planning system is to ensure that a development does not result in 'significant adverse impacts on health and quality of life' (NPPF para 180). BS 4142:2014 +A1:2019 considers that the threshold of 'significant adverse impact' is likely to be around 10 dB or more... depending on upon the context.
- 2.3 BS 4142:2014 comments further with reference to low levels in section 11 in the assessment of impacts and context. It maintains that where background 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 for night time or where daytime levels are also low.
- 2.4 As can be seen above the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound exceeds the background sound level and the context in which it is placed.
- 2.5 In determining background levels the Standard, in Clause 8, maintains that the objective is not simply to ascertain the lowest measured background level but rather to quantify what is typical during particular time periods.

3.0 Noise Survey Details and Criteria.

- 3.1 To establish existing noise levels a survey was carried out over approximately a 24-hour period over the 16th and 17th May 2023 to obtain measurements of the existing noise climate. Measurements were taken at a location that was chosen to represent the residential properties to the north of the site. These being the nearest noise sensitive premises to the plant and delivery area. Full details were provided in the original report submitted with the application and a relevant summary is shown below for convenience and information in table 1.

Table 1: Survey Summary

Day	Daytime (0700 – 1900 hrs)		Evening (1900 - 2300 hrs)		Night Time (2300 – 0700 hrs)	
	L _{Aeq}	L _{A90} *	L _{Aeq}	L _{A90} *	L _{Aeq}	L _{A90} *
16-17 th May	50 dB	44 dB	44 dB	35 dB	44 dB	34 dB

*Representative typical background level for relevant time period.

- 3.2 For information, the data is summarised showing L_{Aeq} and L_{A90} parameters measured in 15-minute samples over the survey period. The existing noise climate is dominated by road traffic noise and vehicular use of the car park including pub deliveries.

Plant noise

- 3.3 Based on the location of the proposed plant, the nearest residential properties windows will be screened by the pitched roof at approximately 20m from the condensers sited towards the rear of the flat roof area. Grazing incidence, where the receiver can just see the source over the top of the barrier, generally provides in the region of 5dB. If the source is not visible then in the region of 10dB attenuation can be provided. All plant is sited on the flat roof and would not be visible.
- 3.4 The proposal is to install: 2 x Mitsubishi PUZ ZM140YKA, 1 x Mitsubishi PUZ ZM100VKA, 2x Copeland ZXDE -040 TFD, 1 x Copeland ZXME020E-PFJ, and 1 x Copeland ZXME025E-PFJ. condensers, with manufacturer's noise data below in table 2 showing worst case mode SPL at 10m. (Data sheet is shown at Appendix C.)
- 3.5 The following indicative noise levels are predicted at the nearest residential windows at 20m.

Table 2: Predicted noise levels at rear residential property

	Predicted noise level	
	Day (0700-2300)	Night (2300-0700)
Mitsubishi PUZ ZM140YKA (SPL 32dB @10m x2)	35 dBA at 10m	35 dBA at 10m
Mitsubishi PUZ ZM100VKA	31 dBA at 10m	31 dBA at 10m
Copeland ZXDE -040 TFD (SPL 40dB @10m x2)	43 dBA at 10m	43 dBA at 10m
Copeland ZXME020E-PFJ	37 dBA at 10m	37 dBA at 10m
Copeland ZXME025E-PFJ	37 dBA at 10m	37dBA at 10m
Total SPL	45 dBA at 10m	45 dBA at 10m
Distance correction 10m to 20m (20logD1/D2)	-6	-6
Acoustic feature correction (intermittency)	+3	+3
Roof Screening	-10	-10
Resultant	32 dBA	32 dBA
Typical Background(Table 1 above) L_{A90}	44 dBA	34 dBA
Difference	-12	-2

- 3.6 The advice within BS 4142:2014 +A1:2019 is considered, specifically at Clause 11 of the BS ('Assessment of the impacts'), sub-paragraph '1)', *"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"*.
- 3.7 The BS 4142 numerical assessment method rates the significance of the impact by comparing the rating level with the background level. A difference (rating minus background) of around +10 dB is likely to be an indication of a significant adverse impact; around +5 dB is likely to be an indication of an adverse impact, and around +0 dB and lower, an indication of a low impact, all depending on the context.
- 3.8 It is predicted that the proposed condensers will operate below adopted background criteria for both day and night time. Absolute levels are also low (i.e <35dB) further to the advice discussed in paragraph 4.4 above, indicating a low impact.
- 3.9 To minimise any potential structure borne noise, it is recommended that the units and pipework are isolated from the building with anti-vibration mounts / resilient pipe mounts, and flexible couplings fitted between the unit and pipework.
- 3.10 It is considered that no further attenuation measures are required in order to operate below existing background levels, given the distance involved, siting, available screening, quiet plant selection, and existing noise climate.
- 3.11 SR is therefore of the opinion that there should be no adverse impact when the new plant is introduced. This will enable plant to operate during both day and night without adverse impact in compliance with national guidance and local aims. This is based on typical background levels measured for the relevant time period further to guidance within BS4142:2014 +A1:2019, and will enable Condition 17 to be met.

Deliveries

- 3.12 It is understood that deliveries are to be restricted to 0800-1800 hours Monday to Saturday, and 1000 -1600 hours on Sunday. No night time nor evening deliveries are proposed. A BS4142 assessment time period for daytime is one hour and 15 minutes at night time. Consequently, any assessment would be undertaken over the one-hour period.

- 3.13 A calculation of delivery noise was provided for the original noise report that accompanied the planning application and is shown again at table 3 below for convenience and information.

TABLE 3: Predicted noise levels – Delivery activity: BS4142 period 1 hour

Activity	L _{Aeqt} dB	Duration (mins)	Distance attenuation dB (20m)	L _{Aeq} 1 hour conversion dB	L _{Aeq} 1hr dB	L _{Amax} dB
Arrival	67	2	(20 log 10/20 = -6	(10 log 2/60) = -14	47	78
Unload	58	40	-6	(10 log 40/60) = -2	50	
Depart	69	0.5	-6	(10 log 0.5/60) = -21	41	
Total L _{Aeq} 1 hr					52	
Screening -10dB					42	
Totals					42	Max 62

- 3.14 The resultant levels are below existing ambient levels within the relevant time periods and around background levels. The delivery activity would not introduce a new or novel noise source given the existing use of the car park area. Maximum levels are consistent with the existing use of the car park.
- 3.15 A delivery management plan is suggested in addition to the above to mitigate the impact of any potential delivery noise it is recommended that all deliveries are carried out in accordance with a delivery management plan (DMP), which can be secured by planning condition. The measures suggested have been shown to reduce the subjective impact of noise from delivery activity by restricting such activities as audible reversing alarms, and noise from on-board refrigeration units, and use of low-noise A frame roll containers.
- 3.16 A suggested DMP is shown at Appendix A to meet the requirements of Condition 8.

4.0 Summary and Conclusions

- 4.1 Sharps Redmore has undertaken an updated noise assessment at Blue Bell Inn, Desford in order to comply with the relevant noise conditions associated with the application.
- 4.2 The impact of plant noise and deliveries has been assessed in accordance with BS 4142:2014+A1: 2019 based on plant data provided for the proposed roof plant and typical delivery data.
- 4.3 The proposed plant and flat roof siting will not exceed typical background levels complying with Condition 17.
- 4.4 Deliveries are to be restricted to between 0800-1800 on Mondays to Saturday and 1000-1600 on Sundays. No night time deliveries are proposed enabling a daytime assessment to be the relevant time period. Resultant levels are below existing daytime ambient and background levels.
- 4.5 A Delivery Management Plan is provided to further mitigate any noise issues from arrivals, unloading and departure complying with Condition 8.
- 4.6 This assessment concludes that noise from the proposal sources would not cause adverse impact to residents if the criteria are complied with.

APPENDIX A

DELIVERY MANAGEMENT PLAN



1. INTRODUCTION

- 1.1. This Delivery Management Plan (DMP) has been prepared on behalf of Co-op Stores Ltd and is submitted to accompany a planning application 23/00711 for a change of use to a food store at The Blue Bell Inn, High Street, Desford.
- 1.2. The purpose of the DMP is to put in place controls to ensure that potential noise and disturbance associated with the arrivals, unloading and departures of delivery vehicles is minimised to protect amenities of neighbouring residents.
- 1.3. The objective is to ensure that delivery activities operate efficiently and effectively minimising instances of potential disruption. Guidance is provided on measures to reduce noise at the delivery point and measures for drivers.
- 1.4. The following sections provide details of the strategies to be employed at the store.

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Company Consultant TL Redmore BEng, MSc, PhD, MIOA



2. TRAINING AND MANAGEMENT

2.1. The following Training and Management measures are recommended:

- Regular training will be undertaken by Co-op's Transport Manager to drivers and colleagues at the store to ensure awareness of the DMP and that the DMP is adhered to at all times.
- The Desford Store Manager will undertake regular checks to ensure the DMP is being adhered to at all times. Details of regular checks will be recorded on the checklist form and kept available for inspection by the local authority for the period of the consent.
- Co-op colleagues will undertake unannounced checks on an ad hoc basis to ensure the DMP is being adhered to at all times

2.2. All vehicles delivering to the Desford store are traceable so the store can monitor deliveries.

2.3. All Co-op deliveries to be scheduled to be between 0800 and 1800 hours Monday to Saturday, and between 1000 and 1600 hours on Sundays.

3. INSTRUCTION FOR STORE COLLEAGUES

- Ensure the loading bay doors and shutters are well maintained to minimise noise when opening and closing
- Not to install or operate tannoy systems between the hours of 6am and 7am Monday to Saturday
- Ensure that the loading bay is clear of obstructions so vehicles can move easily
- Keep doors other than the delivery point closed to ensure noise does not escape
- Make sure the delivery point is ready for the vehicle before it arrives - doors should be open to avoid the vehicle idling
- Ensure staff do not shout or whistle to get the attention of the driver
- Colleagues will take extra care when transferring goods internal, being careful not to bump into walls / doors etc.
- Use of low noise A frame roll containers

4. INSTRUCTIONS FOR DRIVERS

- As you approach the site and manoeuvre in to position, remain aware of the effect noise levels can have on local residents
- Engines should be switched off immediately when not manoeuvring
- Refrigeration equipment should be switched off once the vehicle is stationary and in the unloading position
- Use of broad band reversing alarms where possible
- Switch the radio off before opening the vehicle doors
- Minimise the frequency of opening and closing vehicle doors and do so quietly
- No slamming doors
- Lower flaps on tail lifts quietly and carefully
- Do not whistle or shout to get the attention of store employees
- When working in the vehicle load space avoid banging pallets into the vehicle walls
- When finishing unloading/loading, close up the vehicle quietly
- Drivers should avoid over revving and seek to accelerate gently until the vehicle is a reasonable distance from the store, minimising excessive air brake noise
- Where possible, drivers should refrain from starting up vehicle refrigeration units until the vehicle is away from the store and residential properties

5. INSTRUCTION FOR THE STORE MANAGER/COMPLAINTS

- 5.1. The Store Manager involvement in the management store deliveries is crucial. They may well be the first point of contact for customers and residents.
- 5.2. It is envisaged that there will be no complaints given the mitigation measures, however if complaints are received, it is essential that they are treated consistently and accurately recorded.
- 5.3. If complaints are received from residents by letter, email, by telephone or face to face they should be responded to politely and sympathetically to residents' concerns. The complaint should be logged accurately and reviewed with colleagues and the driver to determine whether the complaint is reasonable and justified. The Store Manager may also direct complainants to notify Co-op's Transport Manager. The following complaint details should be recorded:
- Name and contact details of complainant;
 - Time and date of complaint;
 - The cause of the complaint e.g. shouting or music;
 - Effect of noise disturbance;
 - Action taken.
- 5.4. These details will also be provided to the Council within 48 hours of the complaint being made.
- 5.5. Any breaches of the DMP identified by the store manager or received directly by the store will be notified to Co-op's Transport Manager. The information to be recorded will include date and time of breach, and any action taken to remedy breach.
- 5.6. Similarly, if at any time the Council receives a complaint, they will notify the store as soon as practically possible on becoming aware that a breach may have occurred. The notification shall include details of the alleged breach and time and date that it occurred.

APPENDIX B

ACOUSTIC TERMINOLOGY

Appendix B: Guide to Acoustic Terminology

Ambient noise:

The totally encompassing sound in a given situation at a given time. Most often described in terms of the index L_{AeqT} .

Atmospheric absorption:

The excess acoustic attenuation, over and above that caused by distance attenuation, due to the interaction of an acoustic wave with air molecules.

A-weighting:

A frequency weighting which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Units may be denoted as dB(A) or as sound pressure levels L_{pA} in dB. 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.

Background noise:

See L_{A90} .

Decibel (dB):

A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μ 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.

Façade noise level:

The noise level adjacent to the façade of a building, usually at a distance of 1 metre.

Free-field noise level:

The noise level away from the façade of a building or other structure.

Hertz (Hz):

Unit of frequency, equal to one cycle per second. Frequency is related to the pitch of a sound.

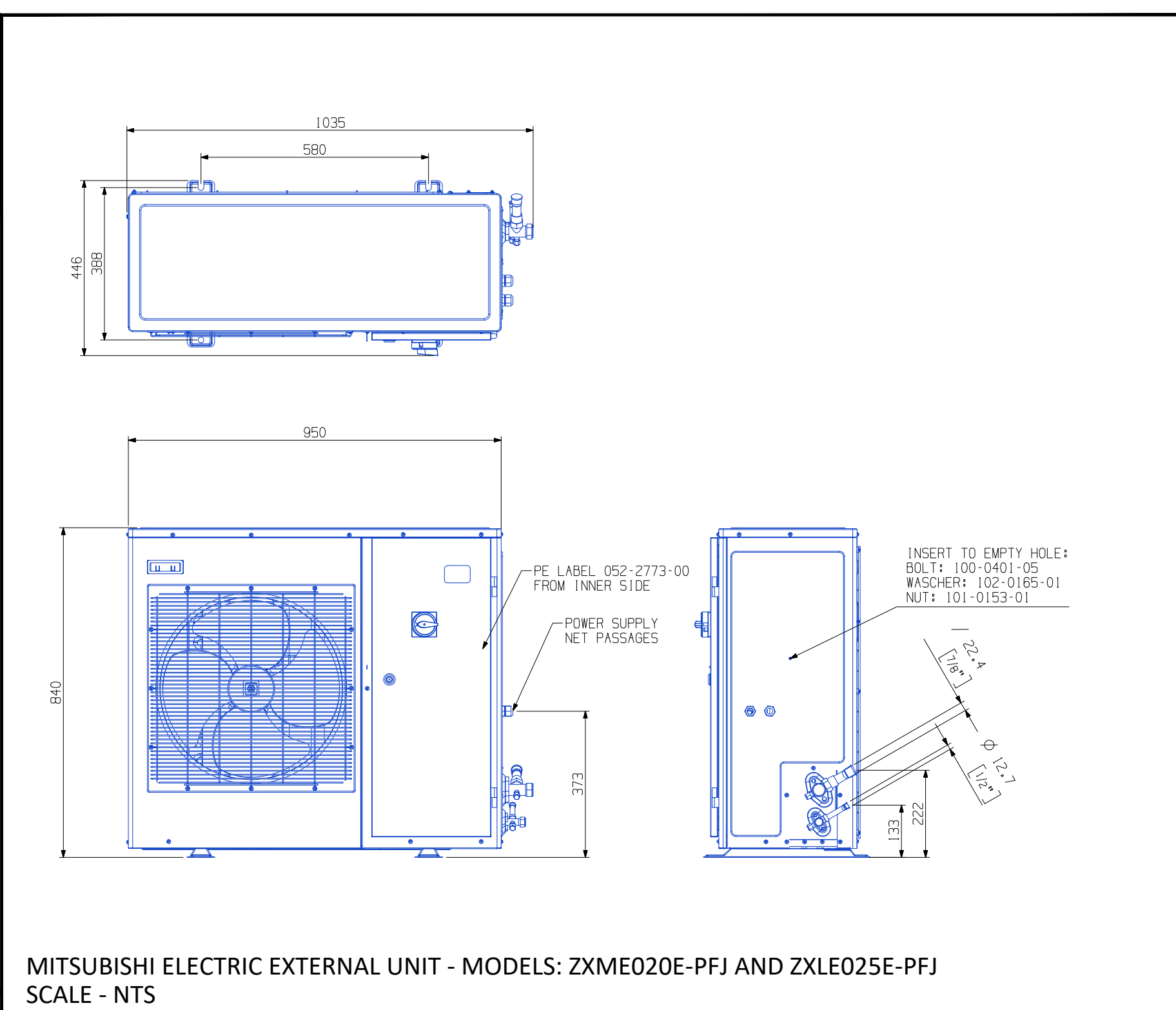
L_{A10T} : The A weighted level of noise exceeded for 10% of the specified measurement period, T. It gives an indication of the upper limit of fluctuating noise such as that from road traffic. $L_{A10,18hr}$ is the arithmetic average of the 18 hourly $L_{A10,1hr}$ values from 0600 hrs to 2400 hrs.

L_{A90T} : The A weighted noise level exceeded for 90% of the specified time period, T. In BS 4142: 2014 it is used to define background noise level.

- L_{AeqT} : The equivalent continuous sound level - the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period, T . This period is taken to be 16 hours (0700 hrs to 2300 hrs) and 8 hours (2300 to 0700 hrs) to describe day and night, L_{Aeqt} is used to describe many types of noise and can be measured directly with an integrating sound level meter.
- SEL or L_{AE} : The sound exposure level is the A-weighted sound energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparisons to be made between different noise events which occur for different lengths of time.

APPENDIX C

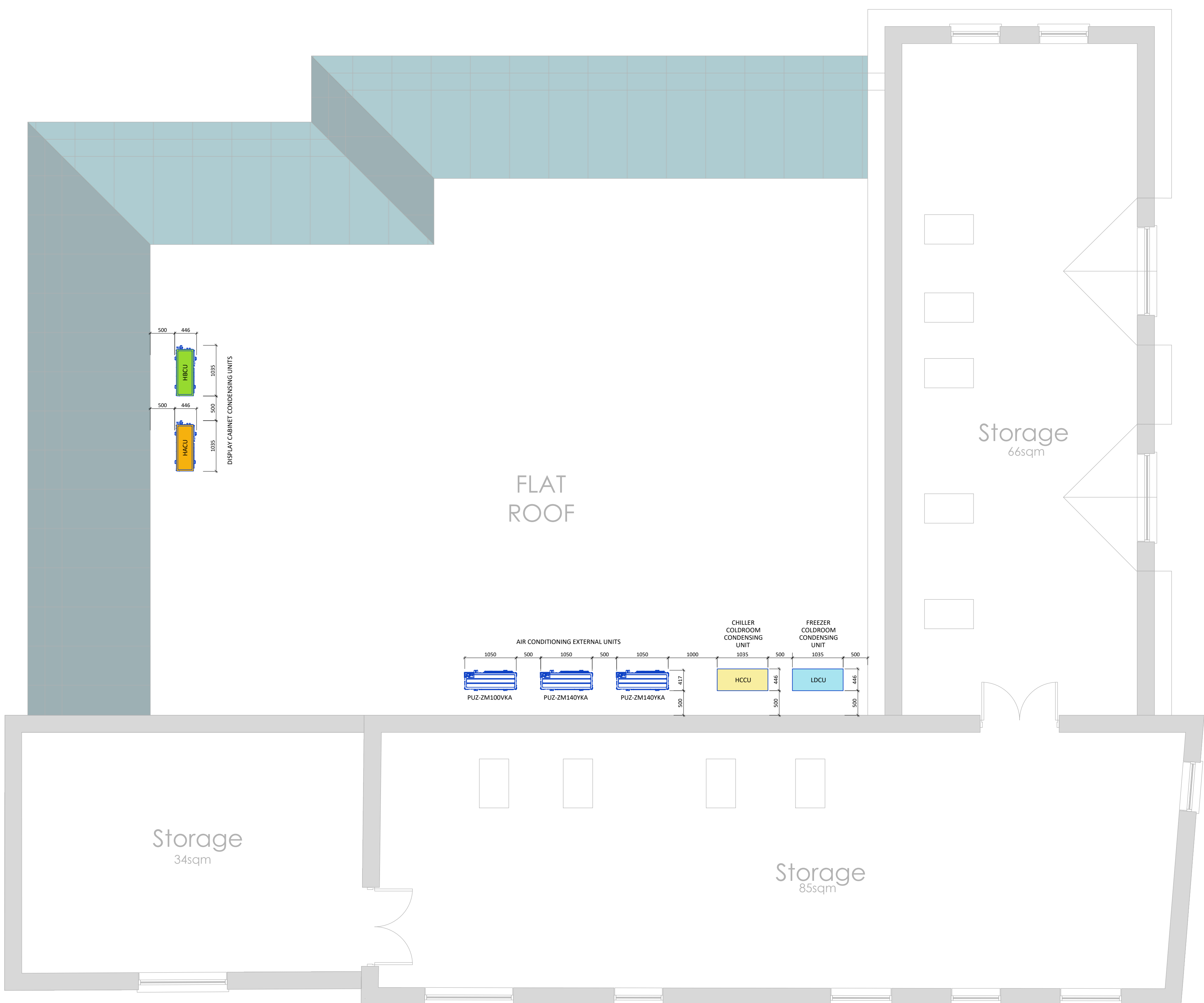
DATA SHEETS



PLANT REFERENCE	NEW / EXISTING	UNIT MODEL	MANUFACTURER	DESCRIPTION	REFRIGERANT	RECUITING VOLUME (l/h)	HT CAPACITY @ 4°C (100) (kW)	HT COMPRESSOR REFERENCE	HT COMPRESSOR MAKE	HT COMPRESSOR MODEL	LT CAPACITY @ 2°C (250W)	LT COMPRESSOR REFERENCE	LT COMPRESSOR MAKE	LT COMPRESSOR MODEL	THP (kW)	DESIGN RUA CURRENT (AMPS)	MAXIMUM FLUID CUMULATIVE CURRENT (AMPS)	SUPPLY VOLTAGE	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NET WEIGHT (kg)	SOUND LEVEL DATA (dB(A) @ 5m)	SOUND LEVEL NOTE (THP (kW) @ 5m)	REFRIG. CATEGORY	
HACU	New	ZXOR-040-T10	Copeland	External Condensing unit	R484A	5.9	9.34	HT1	Copeland	ZXOR-040	2.37				11.8	7.9	480v/3ph/50Hz	1035 mm	447 mm	1244 mm	115 kg	40 dB (A)	40 dB (A)	S6P		
HBCU	New	ZXOR-040-T10	Copeland	External Condensing unit	R484A	5.9	9.34	HT1	Copeland	ZXOR-040						11.8	7.9	480v/3ph/50Hz	1035 mm	447 mm	1244 mm	115 kg	40 dB (A)	40 dB (A)	S6P	
HCCU	New	ZXMR020E-PF1	Copeland	External Condensing unit	R484A	4.1	3.70	HT1	Copeland	ZX15						-	7.5	12.8	230v/1ph/50Hz	1035 mm	446 mm	840 mm	76 kg	37 dB (A)	37 dB (A)	1
LDCU	New	ZXLR0254-PF1	Copeland	External Condensing unit	R484A	4.1		-	-	-			LT No. 1	Copeland	ZX08	-	7.4	15.6	230v/1ph/50Hz	1035 mm	446 mm	840 mm	79 kg	37 dB (A)	37 dB (A)	1
							-	-	-	-		-	-													
							-	-	-	-		-	-													
							-	-	-	-		-	-													

CE COOP Desford - AIR CONDITIONING UNITS SCHEDULE								
Ref No	Location	Manufacturer	Model	Description	Cooling Capacity (kW)	Heating Capacity (kW)	SPL [dB(A)]	Power Supply
AC01	SALES AREA	MITSUBISHI ELECTRIC	PLFY-M80VM6-E-TH	CASSETTE INTERNAL UNIT	8.1	10.0	37	220-240V, 1ph
AC02	SALES AREA	MITSUBISHI ELECTRIC	PLFY-M80VM6-E-TH	CASSETTE INTERNAL UNIT	8.1	10.0	37	
AC03	SALES AREA	MITSUBISHI ELECTRIC	PLFY-M80VM6-E-TH	CASSETTE INTERNAL UNIT	8.1	10.0	37	
AC04	SALES AREA	MITSUBISHI ELECTRIC	PLFY-M80VM6-E-TH	CASSETTE INTERNAL UNIT	8.1	10.0	37	
AC05	WAREHOUSE	MITSUBISHI ELECTRIC	PCFY-M100VM-ER2	CEILING SUSP. INTERNAL UNIT	10.1	12.5	43	220-240V, 3ph
AC06	ROOF	MITSUBISHI ELECTRIC	PUZ-ZM140YKA	OUTDOOR EXTERNAL UNIT	12.9 (input)	13.6 (input)	52	
AC06	ROOF	MITSUBISHI ELECTRIC	PUZ-ZM140YKA	OUTDOOR EXTERNAL UNIT	12.9 (input)	13.6 (input)	52	
AC06	ROOF	MITSUBISHI ELECTRIC	PUZ-ZM100VKA	OUTDOOR EXTERNAL UNIT	9.2 (input)	9.5 (input)	51	

CE COOP Desford - EXTRACT GRILLE SCHEDULE							
Ref No	Manufacturer	Type / Model	Size	Flow Rate [l/s]	Pressure Drop [Pa]	NR [dB]	Throw [m]
EG01	WATERLOO AIR PRODUCTS	LOUVERED FACE DIFFUSER / DF41	150x150	24	8	-	N/A
EG02	WATERLOO AIR PRODUCTS	AIR VALVE / RVW	100	15	4	-	N/A
EG03	WATERLOO AIR PRODUCTS	AIR VALVE / RVW	125	20	4	-	N/A
EG/ 4	WATERLOO AIR PRODUCTS	LOUVERED FACE DIFFUSER / DF41	375x375	150	10	-	N/A



NOTES

DO NOT SCALE FROM THIS DRAWING.
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

FIXTURE IDENTIFICATION

-  HACU CONDENSING UNIT
-  HBCU CONDENSING UNIT
-  HCCU CONDENSING UNIT
-  LDCU CONDENSING UNIT

A	02/07/2024	Updated plant layout to rooftop location.	M.Mc
-	19/09/2023	First Issue. Based on D83 drawing number 16591-D83-B01-00-DR-A-SK-001.	M.Mc
Rev	Date	Description	Drawn By
Client			

central coop

Project
(Bluebell) High Street, DESFORD,
Leicester. LE99JF

Drawing Title

EXTERNAL PLANT LAYOUT



0121 250 1000
sales@cartersynergy.com
www.cartersynergy.com
90 Lea Ford Road, Birmingham, B33 9TX

Drawing Status			
FOR INFORMATION			
Scale	Date	Drawn By	Checked
1:50 @ A0	JUL '24	M.Mc	R.R
Project No.	Drawing No.		Revision
531037	01		A

GROUND FLOOR LAYOUT
SCALE - 1:50

ROOF LAYOUT
SCALE - 1:50