

J D Wetherspoon Public House 49 Piccadilly, Manchester, M1 2AP

Mechanical Services Plant Noise Impact Assessment

Report ref.

RK3202/20294/Rev 0

Issued to

J D Wetherspoon Plc

Prepared by

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Senior Consultant

Version	Remarks	Date
Rev 0	Initial report issue.	27.05.2021



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1. INTRODUCTION

J D Wetherspoon Plc have been granted planning permission (reference 128588/FO/2020), subject to conditions, to install new mechanical services plant equipment at their Public House at 49 Piccadilly in Manchester, M1 2AP. One of the conditions relates to noise.

Condition 3. a) Any externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.

In order to achieve this, the development hereby approved shall be carried out in accordance with the recommendations within the Mechanical Services Plant Noise Impact Assessment by Spectrum Acoustic Consultants, ref. RK3013/20294/Rev 0, dated 13 October 2020.

b) Upon completion of the development and before any of the external plant is first operational, a verification report will be required to validate that the work undertaken throughout the development conforms to the above noise criteria. The report shall give the results of post-completion testing to confirm that the proposed noise limits are being achieved once the plant and any mitigation measures have been installed. Any instances of non-conformity with the above criteria shall be detailed along with any measures required to ensure compliance. The report and any necessary measures shall be approved in writing by the City Council as Local Planning Authority and the development shall be implemented in full in accordance with the approved details before the plant is first brought into use.

Reason. To safeguard the amenities of the occupiers of nearby residential accommodation, pursuant to policies SP1 and DM1 of the Core Strategy.

Accordingly, Spectrum Acoustic Consultants have been instructed by J D Wetherspoon to carry out a post completion validation Noise Impact Assessment. This report is submitted with the intention of providing sufficient information to satisfy the requirements of Condition 3 set by Manchester City Council.

2. SITE DESCRIPTION & PROPOSALS

The Public House is located at 49 Piccadilly in Manchester, M1 2AP. The six-storey high building consists of a Public House at ground floor level, with offices directly above. Piccadilly bounds the property to the south and has a number of commercial properties located directly opposite, including One Piccadilly which comprises of offices, retail units and restaurants. Bounding the site to the east and west are existing commercial properties fronting on to Piccadilly. Bounding the site to the north is Back Piccadilly, which has a number of commercial properties located along it, along with holiday apartments at 31 Back Piccadilly. A site location plan is included in Appendix A.

The planning consent relates to the installation of two refrigeration condenser units externally at ground floor level next to existing mechanical plant at the rear of the building on Back Piccadilly. Following the granting of planning permission, the units were installed within a plant room at the rear of the building which has weather louvres in the façade facing Back Piccadilly.



It is understood the location of the plant was changed by the installation engineer for operational reasons. The new location results in lower noise levels from the equipment at the nearby sensitive receptor locations. The units provide cooling to a new walk in fridge and separate walk in freezer associated with the kitchen. The units operate throughout the daytime and night-time periods. Scheme drawings are included in Appendix B.

3. NOISE CRITERIA

3.1 BS 4142:2014 METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND

The noise impact assessment relating to mechanical plant will be carried out in accordance with the procedures set out in BS 4142:2014 *Methods for rating and assessing industrial and commercial sound*. The principle of BS 4142 is to determine an initial estimate of impact of industrial/commercial sound on nearby residents by comparing the Rating Level (sound level from the industrial/commercial source, with a correction applied for any acoustic features that characterise the sound) with the Background Sound Level (L_{A90} as measured in absence of the industrial/commercial source).

Generally, the greater the difference by which the Rating Level exceeds the Background Sound Level, the greater the magnitude of impact. BS 4142 states that *'a difference of around +10 dB or more is likely to be an indication of a significant adverse impact [...]. A difference of around +5 dB is likely to be an indication of an 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.'*

However, BS 4142 also advises that *'when making assessments and arriving at decisions [...] it is essential to place the sound in context'* so in each case, the context in which the sound is placed must be considered and the initial estimate of impact should be modified accordingly. For example it advises *'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.'*

It also indicates that impacts estimated during *'the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes.'*

4. BACKGROUND NOISE MEASUREMENT SURVEY

To inform the noise impact assessment, attended measurements of existing background noise levels were previously carried out during a noise survey conducted at the site from Thursday 8 to Friday 9 October 2020 prior to the installation of the new equipment. The measurements were carried out by Spectrum to inform the previous planning noise impact assessment report (reference RK3013/20294/Rev 0), prior to the new equipment being installed. The noise measurements are still considered to be representative. Weather conditions during the survey were mild and dry, with low wind speeds, presenting good conditions for noise measurement purposes.

Attended measurements of noise were carried out at the rear of the building during the daytime and night-time periods, outside of 31 Back Piccadilly at first floor level, in accordance with BS 4142:2014. The monitoring location is considered representative of the nearest noise sensitive residential receptor locations to the condenser units. Measurements consisted of continuous 15 minute periods. The microphone was mounted on a pole at first floor level. The location of the microphone is shown on the site location plan included in Appendix A.



The following instrumentation was used during the survey.

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 2739650
- Bruel & Kjaer Type 4189 Microphone s/n 2983518
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3018719

Before and after the survey, the sound level meter was field-calibrated in accordance with the manufacturer's guidelines, and no significant drift was observed. The meter, microphone and field calibrator are laboratory calibrated biennially in accordance with UKAS procedures or to traceable National Standards.

Measurements made were of the following parameters:

- Maximum Noise Level – defined as the maximum (L_{Amax} the maximum noise level)
- Residual Noise Level – defined as the Energy Average Level of a period, in the absence of noise from the proposed development (L_{Aeq})
- Background Noise Level – defined as level exceeded for 90% of a period, in the absence of the noise from the proposed development (L_{A90})

When determining the representative background $L_{A90,T}$ level for the relevant period, BS 4142¹ guidance states “a representative level ought to account for the range in background levels and ought not automatically to be assumed to be either the minimum or modal value.” With this in mind, statistical analysis has been used to determine the typical background $L_{A90,T}$ noise level. This analysis derives the Mode, Mean and Mean -1 standard deviation values. Once these three values have been established, a judgement is made as to which value is considered representative. In this instance, both the mean and modal values were the same. Therefore this value is regarded as being representative.

A full breakdown of the attended measurements is included in the Environmental Noise Record Sheet included in Appendix C. Table 1 shows the representative background noise level measured at the nearest noise sensitive receptor location, during the most sensitive night-time period when the plant items operate.

Measurement Location	Period	Background Noise Level
31 Back Piccadilly	00:00 – 02:00	$L_{A90,15min}$ 57 dB

Table 1: Summary of the representative background noise level measured during the sensitive night-time period

As shown in Table 1, the representative background noise level at the nearest noise sensitive receptors to the mechanical plant is $L_{A90,15min}$ 57dB during the most sensitive night-time period. This reflects a typical steady noise profile controlled by other nearby mechanical plant in the area.

¹ BS 4142:2014 Methods for rating and assessing industrial and commercial sound



5. ASSESSMENT OF NOISE IMPACT

5.1 PROJECTED NOISE FROM MECHANICAL PLANT

The proposed mechanical services plant items are located at the rear of the building within an enclosed plant room which has two banks of weather louvres in the façade facing Back Piccadilly to provide cooling air. The manufacturer's data sheets are included in Appendix B.

For the purpose of this assessment, the specific L_{Aeq} noise levels produced by the new mechanical services plant, directly outside the nearby residential receptor locations, will be established by prediction. This method has been used, as the background noise levels in the area throughout the daytime and night-time periods are relatively high, as would be expected for a city centre location. Therefore, obtaining a representative noise measurement of the plant at the nearby residential receptor locations would not be possible. Consequently, establishing the noise levels from the plant equipment by prediction at the nearby residential receptor locations provides a more robust method.

In order to determine the noise outputs generated by the units, a noise measurement survey was conducted at the site on Tuesday 25 May 2021. Whilst on site, it was possible to measure sound pressure levels close to each of the plant items in isolation. Prediction methodologies use the sound power level (L_w) of a source as input data, so for this purpose, the measured mechanical plant noise levels, expressed in terms of $L_{Aeq,T}$, need to be converted to the equivalent sound power levels. This is derived using the measured plant $L_{Aeq,T}$ (where T is the measurement period), corrected for the measurement surface area enveloping the noise source. A summary of the calculated sound power levels associated with the new plant items is shown in Table 2 below.

Plant Item	Sound Power Level L_w (dB)
Chiller Condenser – Fosters DUET+ 1-1H Low Energy	59
Freezer Condenser – Fosters DUET+ 1-1L Low Energy	63

Table 2: Summary of the plant equipment noise levels (at full duty)

The condenser units operate on thermostatic, speed and timer controls according to heat loads and occupation rates and so would not be operating 100% of the time. Whilst a typical on-time for this type of equipment might only 20-35%, a conservative and therefore more robust assessment assumes a 50% on-time for a typical worst-case scenario (ie 50% of all condensers operating at any one time).

To accurately evaluate the overall effect of the new plant, it is necessary to consider the noise that is generated by the equipment, at the nearby residential receptor locations. Detailed calculations are provided in Appendix D. A summary of the predicted plant noise levels is shown in Table 3 below.

Plant Item	Specific Noise Level at Nearest Residential Property (dB)
Chiller Condenser – Fosters DUET+ 1-1H Low Energy	35
Freezer Condenser – Fosters DUET+ 1-1L Low Energy	39
Total	41

Table 3: Summary of calculated plant noise levels at the nearest noise sensitive residential receptors at 31 Back Piccadilly (6m from plant)



As indicated in Table 3, the predicted noise level at the nearest noise sensitive residential receptors at 31 Back Piccadilly from the newly installed mechanical services plant is L_{Aeq} 41dB(A).

5.2 MECHANICAL PLANT NOISE IMPACT ASSESSMENT

The plant items run continuously during the night-time. Therefore, the predicted plant rating levels will be compared with the representative $L_{A90,15min}$ background noise level measured during the night-time at the nearest sensitive receptor locations.

Table 4 shows a BS 4142 assessment covering the mechanical plant noise impact during the daytime. None of the plant items emit any distinct impulses or tones. However, the plant does emit other characteristics that may be considered distinctive against the existing residual acoustic environment. Therefore, a feature correction has been included in the rating level.

Residential Location	Specific Level (dB)	Character Correction (dB)	Rating Level (dB)	Background L_{A90} Noise Level (dB)	Assessment Level (dB) (Background excess)
31 Back Piccadilly	41	+3	44	57	-13

Table 4: Predicted rating level from the plant items at the nearby sensitive receptor locations, compared with the representative background $L_{A90,15min}$ during the night-time period

As indicated in Table 4, the predicted rating level is 44dB at the nearby residential receptor locations. The predicted rating level is 13dB lower than the representative background $L_{A90,15min}$ level. In line with BS 4142:2014, the noise impact is very low. The difference between the rating levels and background levels is such that any uncertainty would have no significance on the outcome of the assessment.

The predicted rating levels are comfortably lower than Manchester City Council's noise criteria of no higher than 5dB(A) below the measured background noise level at all of the nearby residential receptor locations.

In view of the above, noise levels from mechanical services plant have a very low impact and satisfy the requirements of Condition 3 set by Manchester City Council.

6. CONCLUSIONS

In order to satisfy the requirements of a condition set by Manchester City Council, a noise assessment has been completed relating to the impact of noise produced by the operation of new mechanical services plant at a J D Wetherspoon Public House located at 49 Piccadilly in Manchester, M1 2AP

An attended background noise measurement survey was previously conducted at a location representative of the nearest noise sensitive receptors to the proposed plant and predictions of noise have been completed.

Noise limits for the newly installed mechanical plant have been established for the sensitive night-time period, based on the representative background noise level and taking account of BS 4142 and Manchester City Council's criteria for noise. Predictions have indicated that noise levels from mechanical services plant have a low impact and therefore satisfy the requirements of Condition 3.

APPENDIX A

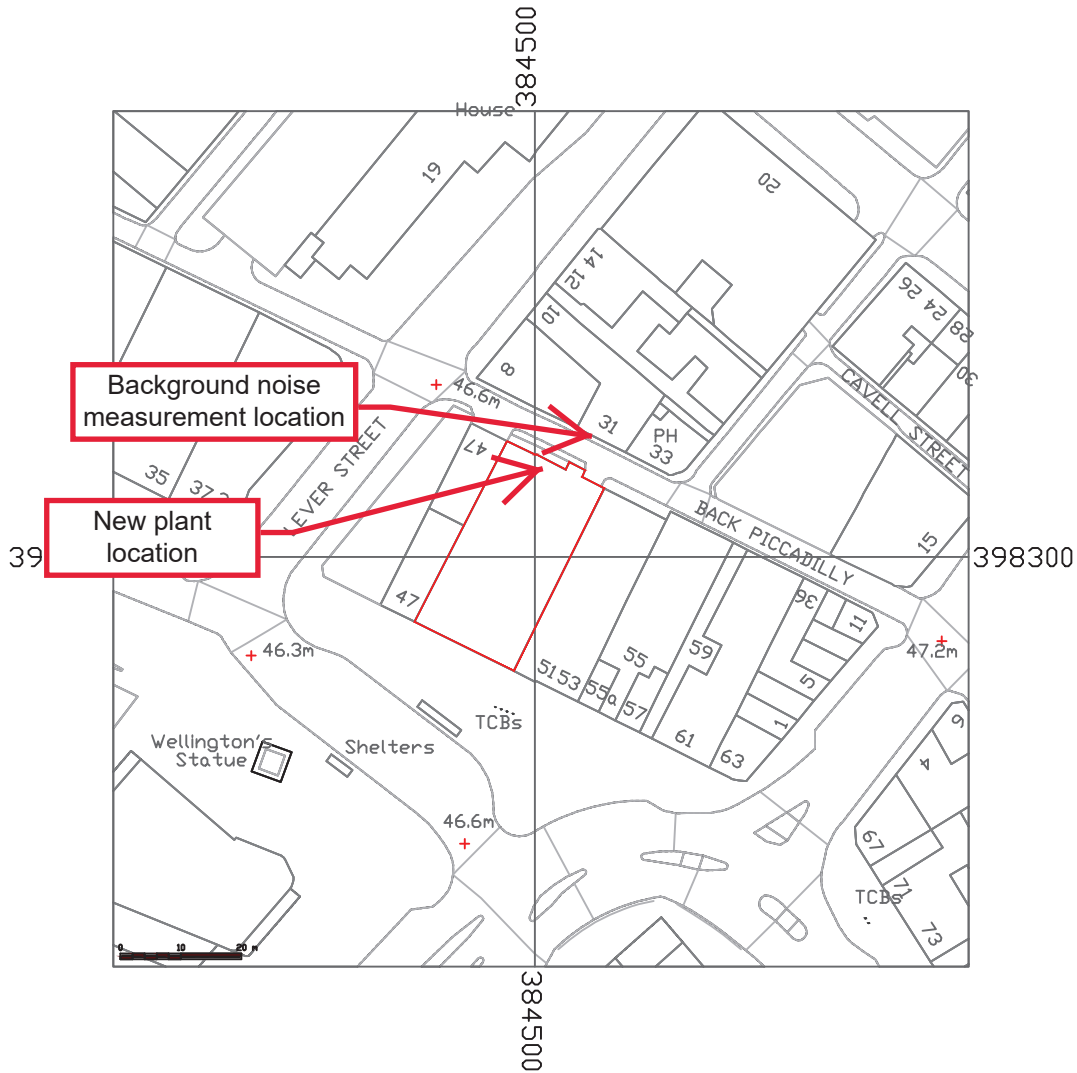
Site Location Plan

Do not scale from this drawing. All dimensions to be checked on site prior to manufacture and construction. This drawing is the property of Harrison Ince Holdings Limited and should not be reproduced without permission.
All discrepancies to be brought to the attention of the architect immediately.
This drawing is to be read in conjunction with the specification / bill of quantities and related drawings.

REVISIONS

FIRST ISSUE

10.03.2020 AA



HARRISON INCE

ARCHITECTS INTERIOR DESIGNERS

CLIENT

JD WETHERSPOONS

PROJECT

**WETHERSPOONS - 49 PICCADILLY
MANCHESTER, M1 2AP**

TITLE

LOCATION PLAN

DATE

MARCH 2020

SCALE

1:1250 @ A4

JOB NO.

PN192-13

DWG. NO.

AP01

DRAWN

CAD/AA

CHECKED

SUN HOUSE
2-4 LITTLE PETER STREET
KNOTT MILL
MANCHESTER
M15 4PS
TEL: 0161 236 3650
EMAIL: enquiries@harrison-ince.co.uk

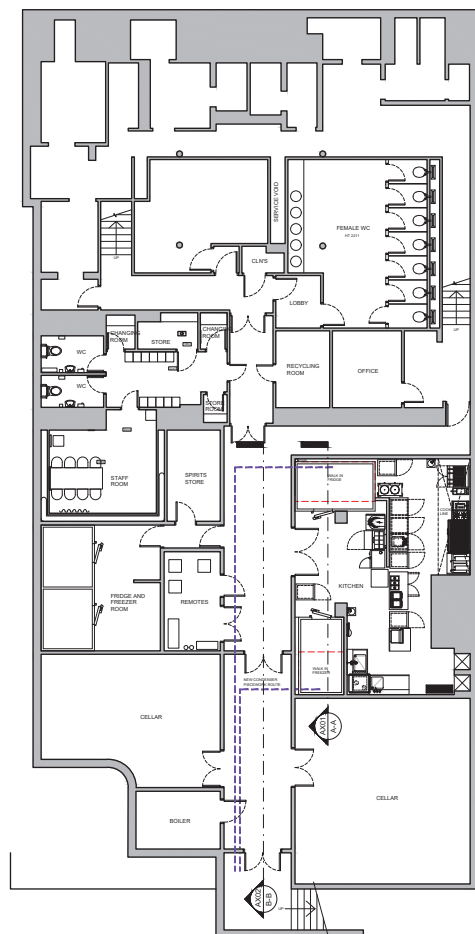
A P P E N D I X B

Scheme Drawings and Manufacturer's Data Sheets

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All discrepancies to be brought to the attention of the architect immediately.
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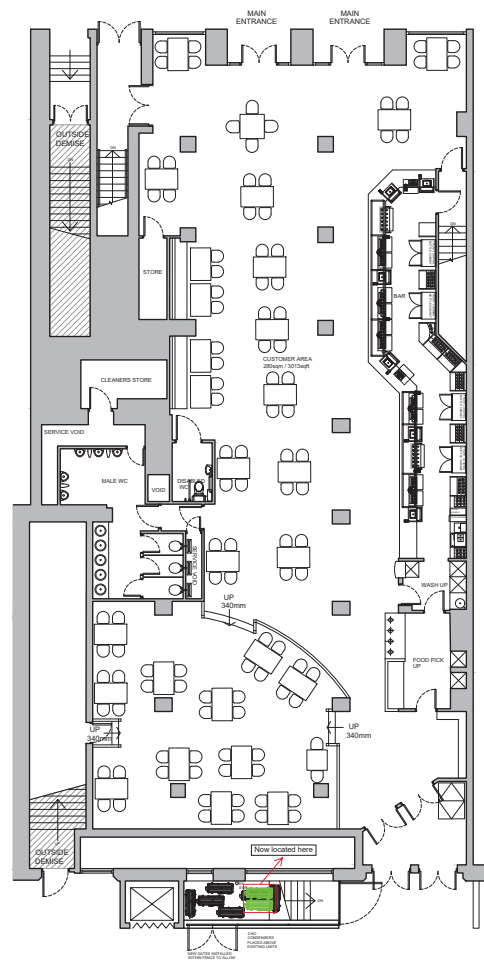
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-	FIRST ISSUE	10.03.2020	OC
A	ADDED SECTION LINES	14.07.2020	OC



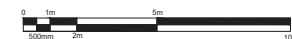
PROPOSED BASEMENT PLAN

Scale 1:100



PROPOSED GROUND FLOOR PLAN

Scale 1:100



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JD WETHERSPOON PLC

PROJECT
WETHERSPOONS - 49 PICCADILLY
MANCHESTER, M1 2AP

TITLE
EXISTING PLANS

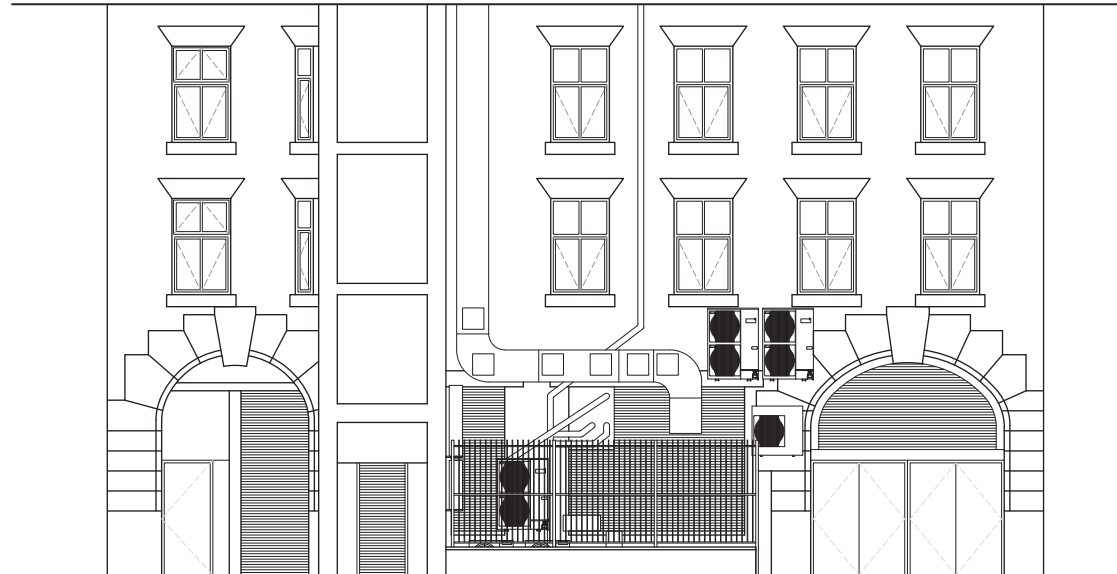
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DRAWN	CAD/OC	CHECKED	

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REVISIONS

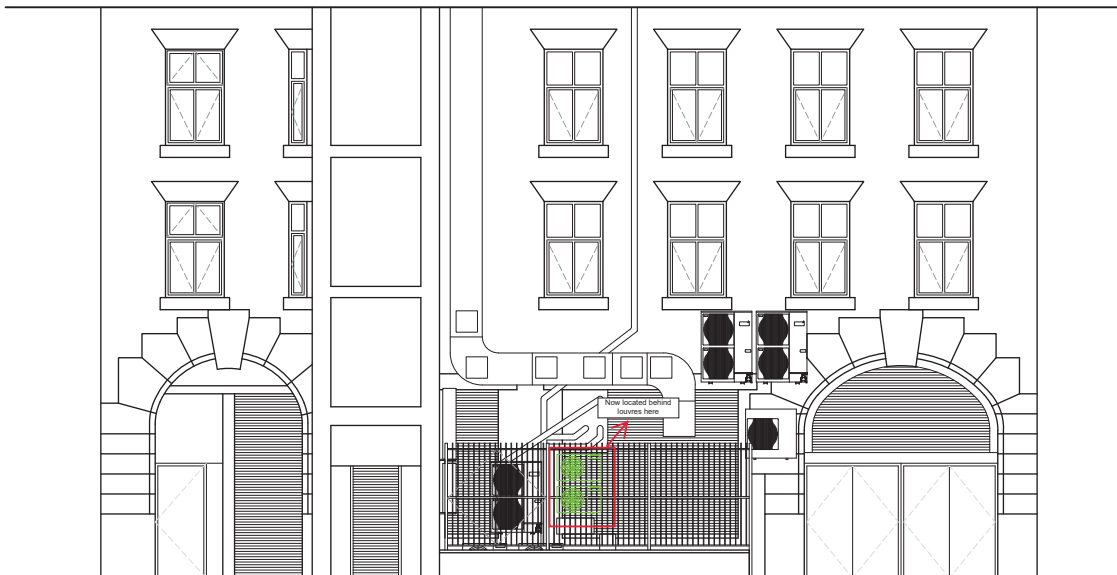
FIRST ISSUE

10.03.20 OC



EXISTING ELEVATION

Scale 1:50



NEW GATES INSTALLED
WITHIN FENCE TO ALLOW
FOR SAFE ACCESS TO ALL
CONDENSERS

2 NO.
CONDENSERS
PLACED ABOVE
EXISTING UNITS

PROPOSED ELEVATION

Scale 1:50



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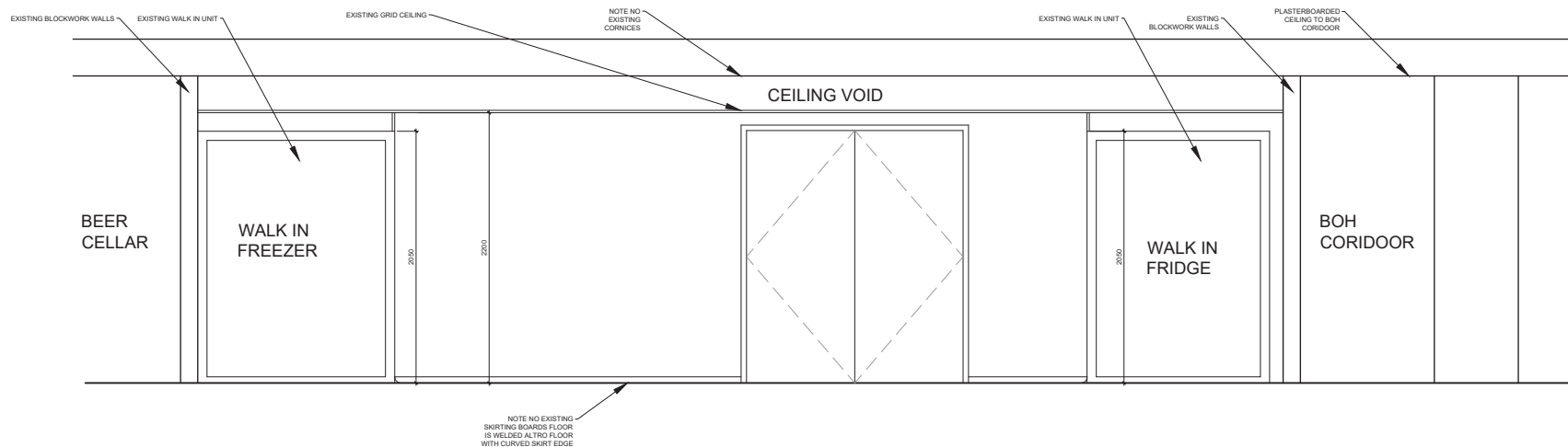
CLIENT
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PROJECT
WETHERSPOONS - 49 PICCADILY
MANCHESTER, M1 2AP

TITLE
EXISTING AND PROPOSED ELEVATIONS

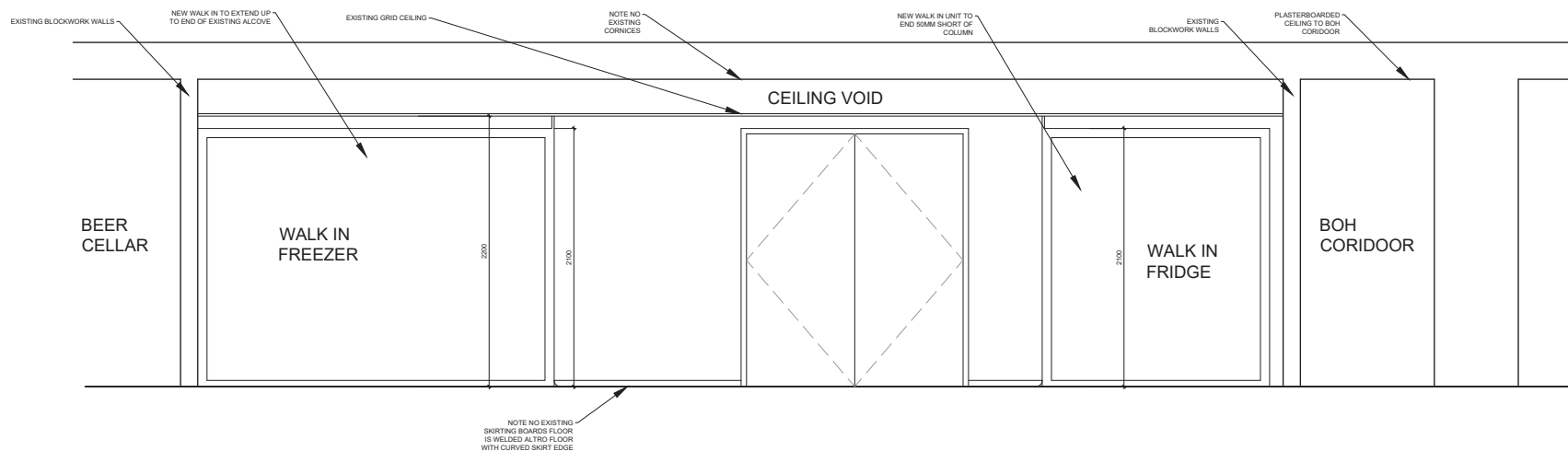
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DRAWN	CAD/OC	CHECKED	

SUN 10/03/20
2-4 LITTLE PETER STREET
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M14 4PS
TEL: 0161 238 3000
EMAIL: enquiries@harrisonince.co.uk



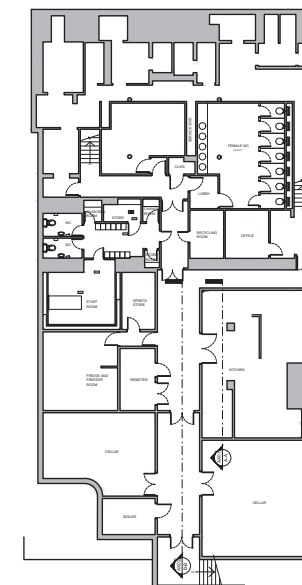
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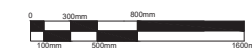
PROPOSED SECTION A-A

Scale 1:20



BASEMENT KEY PLAN

Scale NTS



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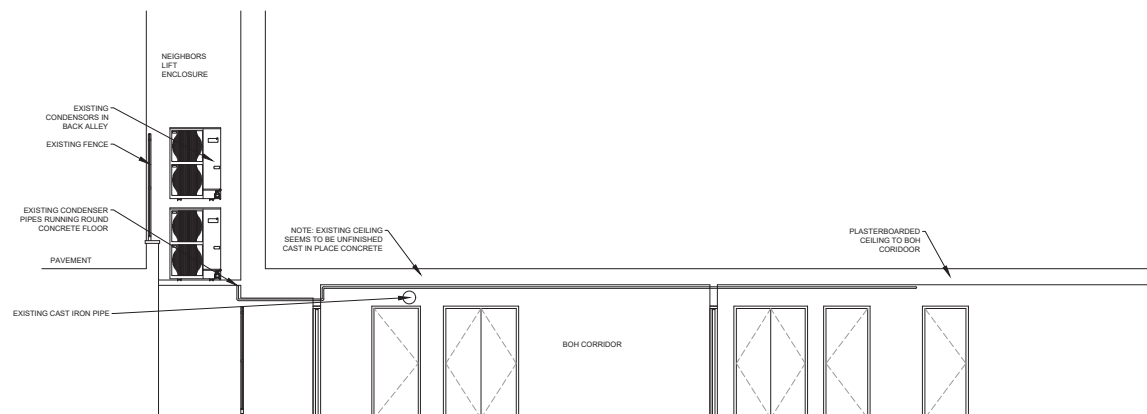
CLIENT JD WETHERSPOON PLC

PROJECT WETHERSPOONS - 49 PICCADILLY MANCHESTER, M1 2AP

TITLE SECTION A-A

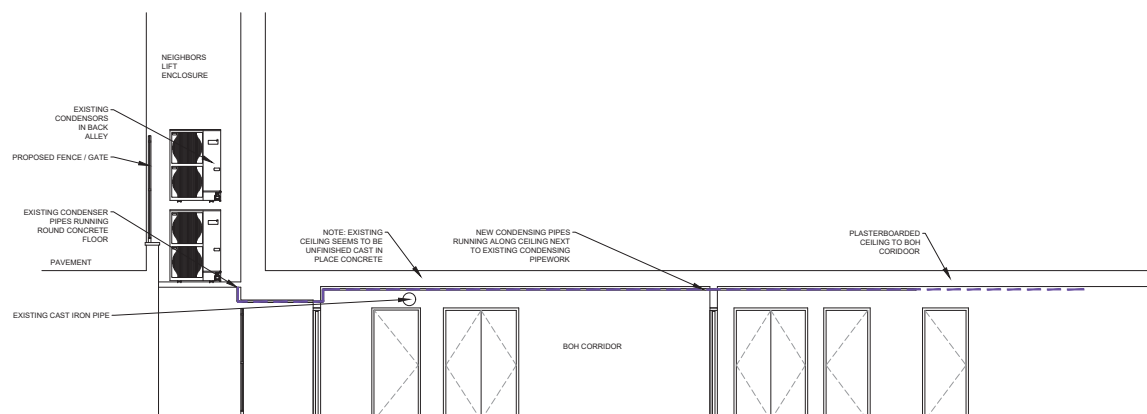
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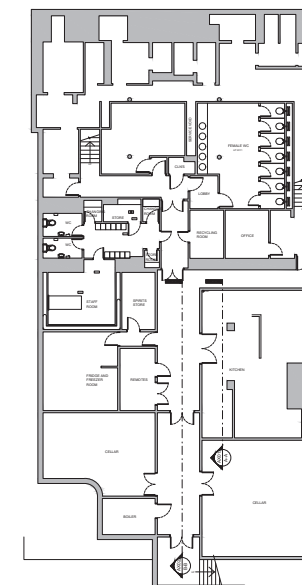
EXISTING SECTION B-B

Scale 1:50



PROPOSED SECTION B-B

Scale 1:50



BASEMENT KEY PLAN

Scale NTS



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CLIENT **JD WETHERSPOON PLC**

PROJECT **WETHERSPOONS - 49 PICCADILLY
MANCHESTER, M1 2AP**

TITLE **SECTION B-B**

DATE	FEB 2020	SCALE	1:20 @ A1
JOB NO.	PN0192-13	DRG NO.	AX02
DRAWN	CAD/OC	CHECKED	

BY: HIR/OC
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TEL: 0161 236 3000
EMAIL: enquiries@harrisonince.co.uk



JDW Piccadilly Manchester

Foster Coldstores Reference: CSQ55368
Date: 21 January 2020
Customer: Wisdom
Delivery Zone: D

Foster Coldstores
Tel: 01553 817766
Project estimator: Sharon Ellerby

Foster Coldstores Quotation:

Dear Helpdesk ()

Many thanks for your valued enquiry; please see attached our quotation as per your request and below a pricing summary for your consideration.

Item No.	Identification	Description	Qty	Pricing Excl VAT
Chiller	Ground Floor Single compartment CSQ55368-1	Walk In Chiller 1500mm (w) x 2900mm (d) x 2100mm (h) AFFL Including the safe disposal of the existing	1	
Freezer	Ground Floor Single compartment CSQ55368-2	Walk In Freezer 3000mm (w) x 1850mm (d) x 2100mm (h) AFFL Including the safe disposal of the existing	1	
		NETT PRICE Excl VAT		

Works by Others

- Provision for new electrics
- Consideration for temporary fridge & freezer hire
- Kitchen screen moved
- Flooring cut back and repaired at later date

Validity

- Prices valid for six months from date of quotation.

Exclusions:

- All works to be completed in one continuous visit
- **All refrigeration works quoted within normal working hours (dismantle and new build during out of hours Mon-Friday).**
- Power supply to be provided by others
- Cable tray, ventilation, infill panelling, scaffolding / lifting equipment and anything else not specifically mentioned within the quotation
- Gastro rack to chiller room due to insufficient space

Terms & Conditions

- This quotation is subject to our standard terms and conditions a copy can be obtained by clicking [here](#).

Availability

- Generally available in a maximum of 3 weeks upon receipt of order. Shorter lead times may be available at time of order. Contact customer sales support for details.

If you need any further information or assistance, please do not hesitate to call.

Kind Regards,

Sharon Ellerby
sharon.ellerby@fostercoldstores.com
Foster Coldstores

Foster Coldstores

Plant 3, Rollesby Road
King's Lynn Norfolk PE30 4LS
Tel: 0843 216 8866 Fax: 0843 216 4708
Website: www.fostercoldstores.co.uk





JDW Piccadilly Manchester

Foster Coldstores Reference: CSQ55368
Date: 21 January 2020
Customer: Wisdom
Delivery Zone: D

Foster Coldstores
Tel: 01553 817766
Project estimator: Sharon Ellerby

Chiller - Ground Floor Single compartment - CSQ55368-1

Reference:	Overall Dimensions:	1500mm (w) x 2900mm (d) x 2100mm (h) AFFL
Insulation:		75mm polyurethane (PUR)
Wall finish:		White PVC laminate internal/external
Ceiling finish:		White PVC laminate internal/Smooth galvanised external
Flooring:		On floor: 75mm insulated floor c/w 1.5mm rigid galv finish
Lighting:		1 x 600mm single LED low energy light, 1 light switch & surface mounted conduit
Doors:		1 x hinged 600 x 1825mm c/w foamed in door operated microswitch, lockable handle & door closure assist device
Curtains:		PVC curtain
Site extras:		1 x stackable frame
Room accessories:		1 x Label, JDW, "DO NOT LOAD PRODUCT" A4, 1 x Label, JDW, "Walk-in Chiller" 33.9 x 63.5mm
Shelving:		4 tier polymer shelving as per attached layout
Refrigerant:		R452a
Refrigeration equipment:		1 x remote low energy system designed to maintain +1/+4°C in a maximum ambient of 32°C33dBA measured at 10m field condition. Control panel: White enclosure c/w volt free contact for connection to BMS by others & high/low audible/visual alarms & door open alarm
Electrical requirements:		230/1/50 20A motor rated electrical supply to the control panel location
Refrigeration installation:		Installation based on a maximum pipe run of 20m including a 2m vertical rise. The condensing unit to be stacked upon condensing unit support frame Refrigeration installation carried out in line with & exceeding the Carbon Trust's Good Practice Guide. Our installation also complies with BS EN 378:1:2008 & the British Refrigeration Association standards as set out in document "Part 5 – Commissioning".
Warranty:		12 months full parts & labour warranty guarantee.
Project management:		Dedicated project supervision included.
Decommission :		Refrigeration equipment to be de-commissioned in a safe and responsible manner.
Coldroom removal:		Safe dismantle of the existing coldroom structure is included within our price, any making good of site is to be carried out by others, removal based on no asbestos content.
Disposal:		Disposal of the above is to be carried out by a fully licensed waste management company and complies with all current legislation, disposal is based on no asbestos content.
Delivery:		Out of hours.

Nett price supplied, delivered and installed

(Excl VAT)

Foster Coldstores

Plant 3, Rollesby Road
King's Lynn Norfolk PE30 4LS
Tel: 0843 216 8866 Fax: 0843 216 4708
Website: www.fostercoldstores.co.uk





JDW Piccadilly Manchester

Foster Coldstores Reference: CSQ55368
 Date: 21 January 2020
 Customer: Wisdom
 Delivery Zone: D

Foster Coldstores
 Tel: 01553 817766
 Project estimator: Sharon Ellerby

Site Refrigeration Equipment

Chiller 1

Condensing Unit



DUET+ 1-1H LOW ENERGY
 550x550x460mm, 38kg, †33dBA

†dBA measured at 10m field condition, dimensions shown are WxDxH unless stated otherwise

Evaporator



FTEC4-5L
 866x376x180mm

Control Panel



DCPG2/W DOA
 230/1/50 20A

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Plant 3, Rollesby Road
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JDW Piccadilly Manchester

Foster Coldstores Reference: CSQ55368
Date: 21 January 2020
Customer: Wisdom
Delivery Zone: D

Foster Coldstores
Tel: 01553 817766
Project estimator: Sharon Ellerby

Freezer - Ground Floor Single compartment - CSQ55368-2

Reference:	Overall Dimensions:	3000mm (w) x 1850mm (d) x 2100mm (h) AFFL
Insulation:		75mm polyurethane (PUR)
Wall finish:		White PVC laminate internal/external
Ceiling finish:		White PVC laminate internal/Smooth galvanised external
Flooring:		On floor: 75mm insulated floor c/w 1.5mm rigid galv finish
Lighting:		1 x 1500mm twin low energy light, 1 light switch & surface mounted conduit
Doors:		1 x hinged 680 x 1825mm c/w foamed in door operated microswitch, low voltage transformer, lockable handle & door closure assist device
Curtains:		PVC curtain
Room accessories:		1 x pressure relief valve, 1 x Label, JDW, "DO NOT LOAD PRODUCT" A4, 1 x Label, JDW, "Walk-in Freezer" 33.9 x 63.5mm, 1 x DCPG Control panel with Door Open Alarm
Shelving:		Reduced height gastro rack and 4 tier nylon coated wire shelving as per attached layout
Refrigerant:		R452a
Refrigeration equipment:		1 x remote low energy system designed to maintain -18/-21°C in a maximum ambient of 32°C42dBA measured at 10m field condition. Control panel: White enclosure c/w volt free contact for connection to BMS by others & high/low audible/visual alarms & door open alarm 230/1/50 20A motor rated electrical supply to the control panel location
Electrical requirements:		
Refrigeration installation:		Installation based on a maximum pipe run of 20m including a 2m vertical rise. Refrigeration installation carried out in line with & exceeding the Carbon Trust's Good Practice Guide. Our installation also complies with BS EN 378:1:2008 & the British Refrigeration Association standards as set out in document "Part 5 – Commissioning".
Warranty:		12 months full parts & labour warranty guarantee.
Project management:		Dedicated project supervision included.
Decommission :		Refrigeration equipment to be de-commissioned in a safe and responsible manner
Coldroom removal:		Safe dismantle of the existing coldroom structure is included within our price, any making good of site is to be carried out by others, removal based on no asbestos content.
Disposal:		Disposal of the above is to be carried out by a fully licensed waste management company and complies with all current legislation, disposal is based on no asbestos content.
Delivery:		Out of hours.

Foster Coldstores

Plant 3, Rollesby Road
King's Lynn Norfolk PE30 4LS
Tel: 0843 216 8866 Fax: 0843 216 4708
Website: www.fostercoldstores.co.uk





JDW Piccadilly Manchester

Foster Coldstores Reference: CSQ55368
Date: 21 January 2020
Customer: Wisdom
Delivery Zone: D

Foster Coldstores
Tel: 01553 817766
Project estimator: Sharon Ellerby

Nett price supplied, delivered and installed

Site Refrigeration Equipment

Freezer 1

Condensing Unit



DUET+ 1-1L LOW ENERGY
650x650x550mm, 65kg, †42dBA

Evaporator



FTEC5-5L
1120x376x180mm

Control Panel



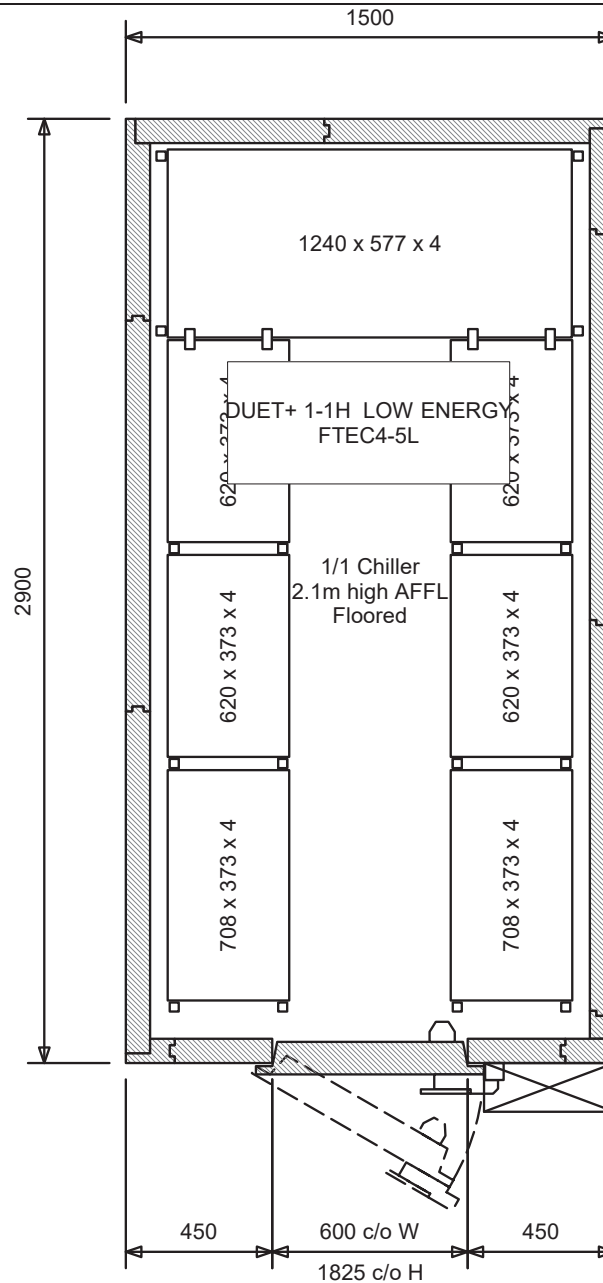
DCPG2/W DOA
230/1/50 20A

†dBA measured at 10m field condition, dimensions shown are WxDxH unless stated otherwise

Foster Coldstores

Plant 3, Rollesby Road
King's Lynn Norfolk PE30 4LS
Tel: 0843 216 8866 Fax: 0843 216 4708
Website: www.fostercoldstores.co.uk





Project created	21/01/20	Sharon Ellerby
Rev Description	Date	By



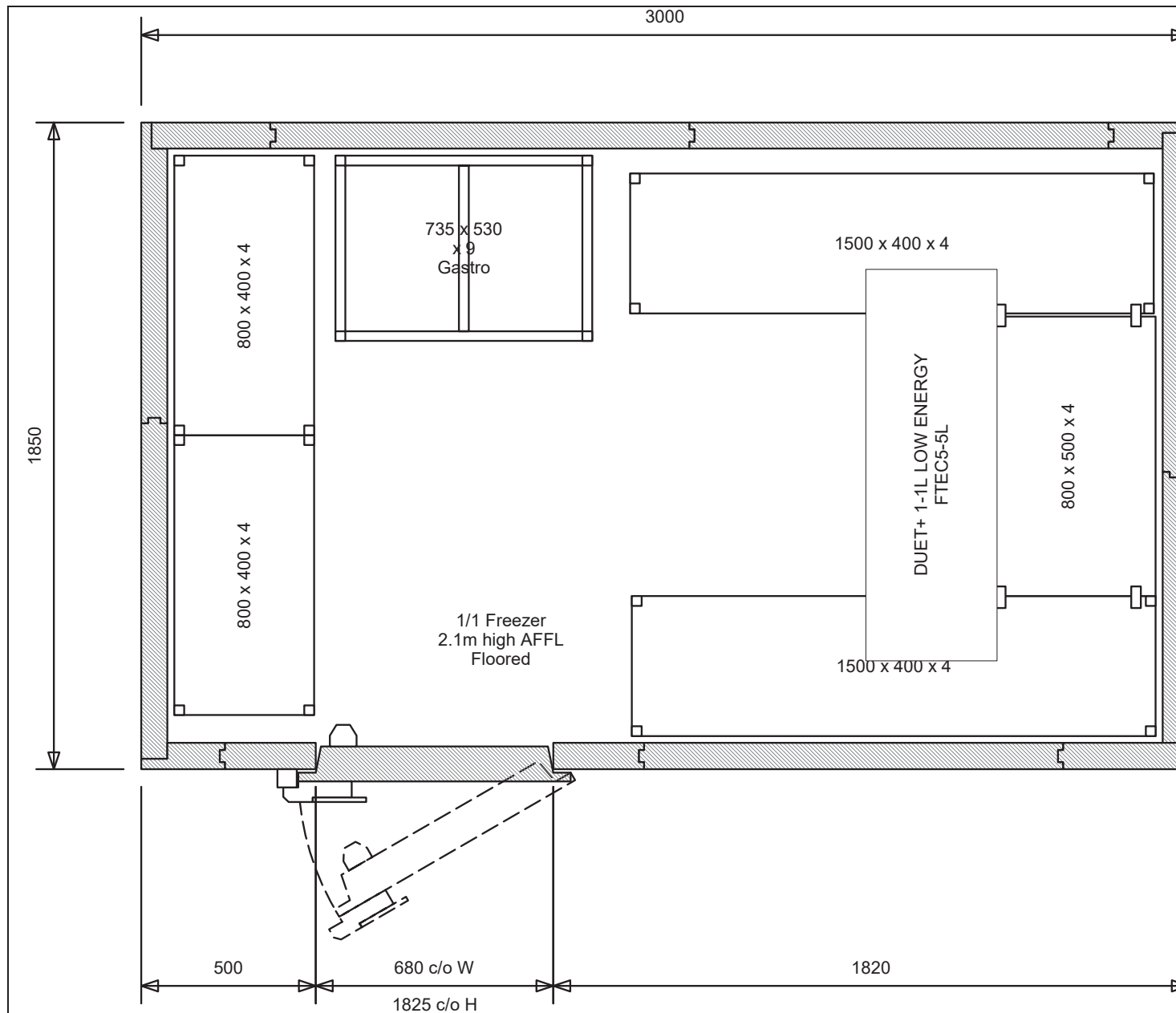
Rollesby Road, King's Lynn, Norfolk, PE30 4LS
 Tel 01553 817766
 E-mail sharon.ellerby@fostercoldstores.com

Drawn:	Scale:	Date:	Issued for comment/approval
S.E.	Not to scale	21/01/20	Issued for manufacture
			Issued as installed layout

Contract:
 JDW Piccadilly Manchester

Title
 Ground Floor Single compartment

Quote No.	Works Order No.	Drg. No.	Rev.
CSQ55368-1			



Freezer room	21/01/20	Sharon Ellerby
Project created	21/01/20	Sharon Ellerby
Rev	Description	Date By



Rollesby Road, King's Lynn, Norfolk, PE30 4LS
Tel 01553 817766
E-mail sharon.ellerby@fostercoldstores.com

Drawn:	Scale:	Date:	Issued for comment/approval
S.E.	Not to scale	21/01/20	Issued for manufacture
			Issued as installed layout

Contract:
JDW Piccadilly Manchester
Title

Ground Floor Single compartment

APPENDIX C

Environmental Noise Record Sheet



ENVIRONMENTAL NOISE RECORD SHEET

Sheet 1 of 3

RJ3/20294

Location: Back Piccadilly, 3m high and 0.5 from façade of Piccadilly Suites

Project: JDW 49 Piccadilly, Manchester

Date: 08/10/2020 – 09/10/2020

Instrumentation: B&K 2250-1

Calibration Times: 18:02 and 18:22, 00:02 and 01:55, 10:47 and 11:06

Plant Operating Condition: Operating, with some plant intermittent

Date	Time		Weather			Noise Level dB(A)						Comments (Including description of noise (eg whine, hiss, rumble, impact, vehicle rain, vegetation, or animal noise)).
	Start	Dur'n (Min)	Wind Speed m/s	Wind Dir'n	Cloud (%)	L10	L50	L90	LMAX	LMIN	LAeq	
08/10/20	18:05	15	Very low	-	80	65	64	63	86	60	64	Droning hum and clicking, 2 cars go past, loud popping as they do 18:06
09/10/20	00:05	15	Very low	-	-	63	62	60	76	59	62	Most plant still running, no clicking now just droning, woman runs past meter 00:07, occasional buses go past, 2-3 every 5 min Lever Street, buzzing plant stops 00:15, clicking plant comes on 00:17
09/10/20	00:20	15	Very low	-	-	63	62	61	82	59	62	00:21 clicking plant turns off, 00:24 buzzing plant comes on, 00:26 metal clanging in distance, 00:28 buzzing plant turns off, no buses Lever Street, street sweeper goes past 00:32 Newton Street, 00:32 taxi goes past, loud popping, 00:35 street sweeper Lever Street
09/10/20	00:36	15	Very low	-	-	63	61	58	71	56	61	Street sweeper engine idling Lever Street from start of measurement goes past again on Lever Street 00:37 then again 00:38 to leave, 00:39 buzzing plant turns on, 00:40 street sweeper goes past Lever Street, 00:43 clicking plant turns on, 00:47 clicking plant turns off, buzzing plant also already off but didn't hear when, 00:48 bus goes past Lever Street

Date	Time	LAeq dB(A)	Leq Octave Band Pressure Level									Comments
			31	63	125	250	500	1k	2k	4k	8k	
08/10/20	18:05	64	76	75	69	64	61	59	57	48	41	L _{Zeq} spectrum
09/10/20	00:05	62	75	75	68	61	58	57	54	44	39	
09/10/20	00:20	62	75	75	68	61	59	57	54	45	39	
09/10/20	00:36	61	60	66	59	60	59	57	53	47	43	



ENVIRONMENTAL NOISE RECORD SHEET

Sheet 2 of 3
RJ3/20294

Location: Back Piccadilly, 3m high and 0.5 from façade of Piccadilly Suites

Project: JDW 49 Piccadilly, Manchester

Date: 08/10/2020 – 09/10/2020

Instrumentation: B&K 2250-1

Calibration Times: 18:02 and 18:22, 00:02 and 01:55, 10:47 and 11:06

Plant Operating Condition: Operating, with some plant intermittent

Date	Time		Weather			Noise Level dB(A)						Comments (Including description of noise (eg whine, hiss, rumble, impact, vehicle rain, vegetation, or animal noise)).
	Start	Dur'n (Min)	Wind Speed m/s	Wind Dir'n	Cloud (%)	L10	L50	L90	LMAX	LMIN	LAeq	
09/10/20	00:51	15	Very low	-	-	60	57	56	64	55	58	00:54 street sweeper goes past Newton Street, 00:55 buzzing plant comes on, 00:56 street sweeper now inaudible after leaving Newton Street, 01:00 buzzing plant turns off
09/10/20	01:07	15	Very low	-	-	63	58	57	65	56	60	01:09 clicking plant turns on, 01:11 buzzing plant comes on, 01:13 clicking plant turns off, 01:15 buzzing plant turns off
09/10/20	01:22	15	Very low	-	-	61	58	57	69	57	59	01:27 buzzing plant comes on, 1:31 buzzing plant turns off and lorry goes past Lever Street, 01:35 clicking plant turns on
09/10/20	01:37	15	Very low	-	-	61	57	56	62	56	59	01:39 clicking plant turns off, 01:43 buzzing plant comes on, 01:48 buzzing plant turns off
09/10/20	01:52	15	Very low	-	-	63	58	58	66	57	60	01:59 buzzing plant comes on, 2:02 clicking plant comes on, 2:04 buzzing plant turns off, 2:05 clicking plant turns off

Date	Time	LAeq dB(A)	Leq Octave Band Pressure Level									Comments
			31	63	125	250	500	1k	2k	4k	8k	
09/10/20	00:51	58	57	61	55	57	54	54	51	41	34	
09/10/20	01:07	60	56	60	55	58	58	56	52	43	37	
09/10/20	01:22	59	57	61	56	58	57	55	51	42	35	
09/10/20	01:37	59	57	59	54	57	54	55	52	42	36	
09/10/20	01:52	60	56	62	56	58	59	56	52	43	37	



ENVIRONMENTAL NOISE RECORD SHEET

Sheet 3 of 3
RJ3/20294

Location: Back Piccadilly, 3m high and 0.5 from façade of Piccadilly Suites

Date: 08/10/2020 – 09/10/2020

Calibration Times: 18:02 and 18:22, 00:02 and 01:55, 10:47 and 11:06

Project: JDW 49 Piccadilly, Manchester

Instrumentation: B&K 2250-1

Plant Operating Condition: Operating, with some plant intermittent

Date	Time		Weather			Noise Level dB(A)						Comments (Including description of noise (eg whine, hiss, rumble, impact, vehicle rain, vegetation, or animal noise)).
	Start	Dur'n (Min)	Wind Speed m/s	Wind Dir'n	Cloud (%)	L10	L50	L90	LMAX	LMIN	LAeq	
09/10/20	10:49	15	Very low	-	50	66	63	62	81	60	64	Slightly louder hum than last night, high pitched tonality, no buzzing or clicking plant from start, frequent buses/cars on Lever Street however intermittent rather than constant traffic flow, 10:52 buzzing plant comes on, then talking people walk past, 10:55 car goes past, 10:56 buzzing plant turns off, 10:58 large truck goes past meter, paused when it comes near, approach was captured, 10:59 pedestrian talking, 11:02 car goes past, loud popping followed by horn on lever street

Date	Time	LAeq dB(A)	Leq Octave Band Pressure Level									Comments
			31	63	125	250	500	1k	2k	4k	8k	
09/10/20	10:49	64	78	77	70	63	61	59	57	50	44	

APPENDIX D

Noise Propagation Calculations

Simple noise propagation calculation



Project:	JDW 49 Piccadilly, Manchester
Project number:	20294
Date:	27.05.2021

Operating condition/scenario:	Normal operation
Receptor:	31 Back Piccadilly

Source	Sound Power Level, dB(A)	Distance to receptor (m)	Directivity Index, dB	Attenuation			% On-Time	Predicted noise level, dB(A)
				Geometric spreading, dB(A)	Screening, dB(A)	Total attenuation, dB(A)		
Chiller Condenser – Fosters DUET+ 1-1H Low Energy	59	6	6	21	0	21	50%	35
Freezer Condenser – Fosters DUET+ 1-1L Low Energy	63	6	6	21	0	21	50%	39
Total								41

$$L_p = L_{WA} - 20 \log(r) + 11 - DI - A_{misc}$$

where L_p is the predicted noise level; L_{WA} is the sound power level; r is distance; DI is the directivity index; and A_{misc} is the attenuation from other miscellaneous factors (i.e. screening/ground effect/atmospheric absorption/foilage).

N.B. If attenuation values for both screening and ground effect are entered, only the higher value is used in the calculation of total attenuation.

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