

REF: AS13322.231117.L2

20 November 2023

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Dear Marcus

AS13322 PIRATE PASTIES, HAMBLE-LE-RICE**Walk-In Freezer Sound Impact Assessment**

Acoustic assessment and advice are sought for an existing external walk-in freezer and associated condenser at Pirate Pasties, situated on the High Street in Hamble.

Clarke Saunders Acoustics (CSA) has undertaken an investigative sound survey at the above site in the aim of determining the prevailing daytime background sound climate and the acoustic impact of the plant associated with the external freezer on nearby residential receptors. Plant sound calculations have been conducted to provide specifications for acoustic mitigation.

The walk-in freezer is currently located in a small courtyard to the west of Pirate Pasties and accessed via the external seating area. The freezer is on a circa 20 cm raised wooden platform and has a surrounding wooden frame with a corrugated plastic roof. It is understood that the initial intention was to cover the wooden frame with trellis planting and to install a sedum green planted roof on the corrugated plastic.

The initial review concluded that the condenser was the primary source of sound. Following comments from the Local Authority, the condenser is proposed to be relocated to the Pirate Pasties rear garden area, adjacent to the kitchen entrance.

The surrounding area is of a mixed-use, typical for a High Street. Most notably, a hairdresser shop is located at ground floor level facing into the courtyard, The Victory pub is adjacent to the site, The River Rat pub is on the other side of the High Street, and there are also some residential properties in the vicinity.

The Victory pub also has an external freezer, which is located to the north of the pub, near the Pirate Pasties rear garden area.

The most affected off-site residential receptor is understood to be Pump Cottage, which has north facing windows at ground and first floor levels.

The tenanted floors above the Pirate Pasties business and courtyard are under the same ownership as Pirate Pasties, however, assessment has also been conducted to the most affected of these habitable room windows, to satisfy the Local Authority. Owing to the proposed new condenser location, the most affected habitable room window will be the north-facing first floor bedroom window.

The attached AS13322/SP1 shows the location of the receptor windows, freezer, condenser and the freezer associated with The Victory pub.

Site Visit Investigations

Attended measurements of L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels were taken on Monday 5th November 2023, between 12:00 and 13:00 hours.

The following equipment was used during the survey:

- Rion sound level meter type NL52;
- Rion sound level calibrator type NC74.

The calibration of the sound level meter was verified before and after use. No significant calibration drift was detected. Weather conditions during the survey were dry with light winds.

Measurements were made following procedures in BS7445:1991 (ISO1996-2:1987) *Description and measurement of environmental noise Part 2 – Acquisition of data pertinent to land use* and BS4142:2014 + A.1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142).

The results of the survey concluded that the condenser serving the walk-in freezer is the primary source of sound at nearby receptors. At the time of the survey, the condenser was located outside the freezer, in-between its north façade and the boundary of the site to the neighbouring residential garden. The condenser was also surrounded with insulation. The survey concluded that the compressor located inside the freezer is of little concern with respect to the local sound climate.

Following review and comments from the Local Authority, it is proposed to relocate the condenser to the location identified in the site plan.

Calculations and Specifications

In order to assess suitable noise mitigation, we have completed plant sound calculations for the condenser associated with the freezer, utilising data measured at site to best ensure the geometry of the courtyard and reflections are accounted for. These calculations have followed the procedures details in BS4142.

Plant sound calculations have been conducted to establish whether screening and additional mitigation would be sufficient to reduce the condenser sound to a suitable level at the receptors at Pump Cottage and at the first floor of Pirate Pasties.

The proposed new condenser location is situated further from Pump Cottage than before. There would also be significant screening losses afforded by the building between the condenser and Pump Cottage.

Calculations have also been conducted to the tenanted first floor bedroom window. This bedroom is situated immediately above the Pirate Pasties seating area, whilst the window faces the rear garden area, which also provides customer seating. It is noted that this window has direct line of sight to the external freezer associated with The Victory pub.

This bedroom window will benefit from screening of the new condenser location, afforded by the building façade itself. To provide an additional element of acoustic screening loss, however, it is proposed to install a solid and imperforate canopy above condenser, which shall extend by 1m from the wall.

Suitable acoustically absorptive products should be installed on the wall against which the condenser is proposed to be installed, which will reduce acoustic reflections.

Owing to the significant screening to Pump Cottage and low resultant Specific Sound Level, it is not necessary to apply character corrections.

Corrections have, however, been applied to the tenanted first floor bedroom window above the Pirate Pasties seating area. To account for the likelihood that the low frequency sound may be just perceptible at this position, a +2 dB correction has been applied, whilst a +3 dB correction has also been applied to account for the perceptible intermittency of the condenser operation.

Table 1 shows a summary of the predicted sound levels, once the mitigation measures are implemented.

PARAMETER	PUMP COTTAGE WINDOW	TENANT UPPER FLOOR WINDOW
Specific Sound Level of condenser, $L_{Aeq,T}$ at 1m	60 dB	60 dB
Distance loss	-21 dB	-14 dB
Screening loss	-18 dB	-14 dB
Specific Sound Level at receptor position, $L_{Aeq,T}$	21 dB	32 dB
Feature Corrections	0 dB	Just perceptible tonality: +2 dB Perceptible intermittency: +3 dB
Rating Sound Level at receptor position, $L_{Ar,Tr}$	21 dB	37 dB
Range of measured daytime background levels, L_{A90}	35-38dB	

Table 1 – Sound level predictions at Pump Cottage

The calculations are shown in the attached Appendix A.

The predicted Rating Sound Levels with advised mitigation are significantly below the daytime background sound levels at the off-site receptor location, indicating a very low likelihood of adverse impact. The Rating Level at the tenanted window above the Pirate Pasties shop is commensurate with the daytime background sound levels, also indicating a low likelihood of adverse impact, particularly when considering the context of this receptor already being exposed to a range of commercial sources, such as external customer activity and the external freezer from The Victory pub.

The predicted Specific Sound Levels are also low in absolute terms, commensurate with or below the desirable internal noise levels within dwellings for daytime and night-time periods, as stated within BS8233:2014 *Guidance on sound insulation and noise reduction for buildings*. This indicates that even when the residential windows are open, the internal noise levels would be significantly below the desirable levels and, therefore, should still allow good internal acoustic conditions to be achieved.

The sound levels may decrease further if the insulation surrounding the condenser was removed, as this may be causing the condenser to run at a higher duty than would otherwise be necessary. This is anticipated to reduce the low frequency sound levels in particular, which would decrease the potential distinctiveness of the sound at the receptor locations.

The context of the surrounding area needs to be taken into account when considering the condenser sound impact. The mixed-use High Street location comprises a number of commercial premises, including pubs, which generate noise emissions from sources such as external plant and patron activity. The potential for condenser sound to be occasionally noticeable in a High Street location is not, therefore, considered unreasonable, particularly when considering the external freezer associated with The Victory pub.

It should be noted that at the time of the survey the neighbouring hairdressers that faces directly onto the courtyard was not in operation. It is understood that when in operation, the windows

are usually open with hairdryers operating frequently throughout the day, contributing to the ambient sound climate. This would further decrease the potential noticeability of the condenser sound during the daytime periods.

Summary

Clarke Saunders Acoustics has conducted an investigation of mechanical services sound emissions from the walk-in freezer at Pirate Pasties, High Street, Hamble. Assessment has been made to off-site receptors, and to the most affected habitable room window of the tenanted dwellings above Pirate Pasties.

Following comments from the Local Authority, the condenser is proposed to be relocated to a more sheltered area, which benefits from increased distance propagation and screening losses to Pump Cottage, thereby resulting in lower sound levels.

The following noise mitigation measures have been advised:

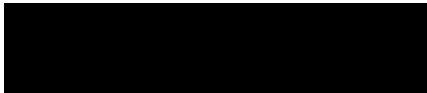
- Relocation of the condenser to the Pirate Pasties rear garden area, adjacent to the kitchen entrance;
- Canopy installed over the condenser, to provide additional screening to the tenanted first floor window;
- Installation of absorptive panels on the wall against which the condenser will be installed.

These mitigation measures will reduce the condenser sound levels well within the daytime background, also below or commensurate with the desirable internal noise levels within dwellings, as specified within BS8233:2014 *Guidance on sound insulation and noise reduction for buildings*.

There is expected to be a low likelihood of adverse impact as a result of condenser sound, particularly when considering the High Street location.

We trust the above to be of assistance. Please do not hesitate to contact us with any queries you may have.

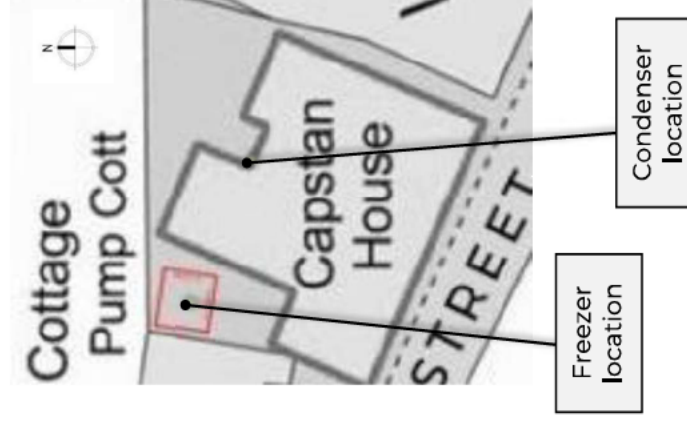
Yours sincerely
for CLARKE SAUNDERS ASSOCIATES



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Encl.



APPENDIX A
AS13322 Pirate Pasties, Hamble
PLANT SOUND CALCULATIONS

Condenser to Pump Cottage		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dB(A)
Condenser	Lp @ 1m	57	61	67	56	47	42	35	31	60
Screening Loss	Source B	-12	-15	-18	-18	-18	-18	-18	-18	-11
Distance Loss	11m	-21	-21	-21	-21	-21	-21	-21	-21	
	Subtotal	24	25	28	17	8	3	0	0	21
Level at receptor	L_{eq 1hr}	24	25	28	17	8	3	0	0	21
No perceptible tonality										
No perceptible intermittency										
Rating Level at receptor										21

Screening loss limited to 18dB

Condenser to Pub 1F window		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dB(A)
Condenser	Lp @ 1m	57	61	67	56	47	42	35	31	60
Building Edge Screening Loss		-6	-7	-8	-10	-12	-15	-17	-20	
Canopy Screening Loss		-5	-5	-5	-5	-6	-7	-8	-10	
Distance Loss	5m	-14	-14	-14	-14	-14	-14	-14	-14	
	Subtotal	32	35	40	27	15	7	0	0	32
Level at receptor	L_{eq 1hr}	32	35	40	27	15	7	0	0	32
Perceptible tonality										+2
Perceptible Intermittency										+3
Rating Level at receptor										37

Screening loss limited to 18dB