

NOISE IMPACT ASSESSMENT

264 KENTWOOD HILL

TILEHURST

RG31 6DR

FEBRUARY 2022.

by

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ENVIRONMENTAL NOISE SURVEY

AND

NOISE IMPACT ASSESSMENT

1. Introduction.

An application has been made for change of use of rear of ground floor shop from Class E (offices) to C3 (dwelling houses) under the terms of Class MA of the Town and Country (General Permitted Development) (England) Order 2015 as amended.

Developments under Class MA are permitted subject to the condition that before beginning the works the developer must apply to the local planning authority for determination as to whether prior approval of the authority will be required as to ...MA.2 (2) (d) impacts of noise from commercial premises on the intended occupiers of the development.

This report analyses the noise that will arise from nearby commercial premises.

2. Description of Proposed Development.

The existing building is terraced with frontage towards Kentwood Hill with retail premises at ground floor and residential flats at first floor.

It is proposed that part of the ground floor shop is converted to a flat.

The proposal is shown on the following floor plans by AJ Plans that have been submitted with the application:

KHR.264.EX.101	Existing Floor Plans
KHR.264.LP	Location Plan
KHR.264.PR.101	Proposed Plans

3. Acoustic Requirements of the General Permitted Development Order

The application has been considered by Reading Borough Council under reference 220106. An internal memorandum dated 1st February 2022 by the Reading Environmental Health Officer recommends that a noise impact assessment is made as follows:

Noise impact on development

A noise assessment should be submitted in support of applications for new residential proposed in noisy areas. Whilst the area in general may not have noisy commercial uses, as the flat will adjoin the shop to the front, an assessment should be submitted to demonstrate that the sound insulation between the two uses will be sufficient to enable the shop to operate without undue restrictions and to enable the occupant of the flat to live without being disturbed by activities in the shop. This is especially important given the layout being a studio and therefore all the living space adjoins the shop directly.

If a condition is required, the below would be suitable.

Ø N7 NOISE ATTENUATION SPECIFIC SOURCE (TO BE SUBMITTED)

No development shall commence on site until a scheme for protecting the occupants of the flat from noise from the adjoining shop has been submitted to and been approved in writing by the Local Planning Authority.

All works which form part of the approved scheme shall be completed before any part of the flat is first used or occupied and the approved measures shall thereafter be retained in effective working order.

REASON: *These details are required due to insufficient information being contained within this submission and in order to safeguard the amenity of occupants in accordance with Policy CC8 of the Reading Borough Local Plan 2019.*

The Order

Developments under Class MA are permitted subject to the condition that before beginning the works the developer must apply to the local planning authority for determination as to whether prior approval of the authority will be required as to ... MA.2 (2) (d) impacts of noise from commercial premises on the intended occupiers of the development.

It is noted that the Order only refers to noise from commercial premises; in this respect it differs from planning requirements that include other sources of external noise such as railways and roads.

The meaning of condition (d) is not further defined in the Order. For the purpose of this report the standards usually applied in planning applications are used as a basis.

Current Standards.

For planning applications, the guidance of BS 8233-2014 is used; compliance with the recommendations will satisfy the requirements of the Permitted Development Order.

Guidance contained in British Standard BS 8233 2014 includes recommendations for noise levels within domestic accommodation.

Paragraph 7 includes Table 4 that gives the following criteria

Table 4 Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Dining	Dining room/area	40 dB LAeq,16hour	—
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour

BS 8233 provides guidance on how to establish noise levels within buildings and BS 4242:2014 gives methods for rating and assessing industrial and commercial sound.

4. Site Observations

Figures 1 of this report is a site plan showing the locations of the proposed flat in relation to adjacent commercial premises.

Figure 2 is a photograph at the front of the building taken from Google Street View. The building to the right is Costcutter Grocers and the left is Industrial Air Limited. These buildings were current at time of our inspection in February 2022.

There are residential flats at first floor for all three buildings. These flats have full planning consent and have been in use as private residences since the construction of the buildings.

Figure 3 is a view at the rear taken from the first floor above the proposed flat at 264 looking towards the rear of Industrial Air Limited at 266. There are two air conditioning condensing units at the rear and these were observed to run during our site inspection. Noise from these units to the proposed flat is analysed in this report.

Figures 4 and 5 show the rear view from roof above the proposed flat looking towards Costcutter at 260 to 262.

It was not possible to obtain access to the garden area at the rear of the flat but there would have been no sight of any commercial equipment in nearby premises from that location.

Two air conditioning condensing units are shown in Figure 4 at the rear of Costcutter. They are on the roof of a single storey building at a distance of 16 metres from the window of the living room of the proposed flat. The units were not running or were not audible at the time of our inspection. The maximum sound power level from this type of unit will not exceed 65 dBA. The combined noise level for two units would be 68dB SWL.

Noise attenuation by distance is given by $A_{Div} = 20 \log d + 11 \text{ dB} = 35\text{dB}$ at 16 metres. There is further attenuation arising from the barrier of the existing buildings between the subject window and noise source. Sound pressure level arising from the units outside the window of the proposed flat will therefore not exceed $68\text{dBA} - 35\text{dB} = 33\text{dBA}$ and the noise level inside the flat will be less than $33\text{dBA} - 15\text{dB} = 18\text{dBA}$. This is clearly much less than the 30dBA recommended by BS 8233.

The premises of Industrial Air Limited is some kind of retail space or administrative office and there was no workshop activities observable.

The Costcutter premises is a normal grocer shop and no industrial noise is present.

Building to South: 266 Industrial Air Ltd

The adjacent building to the south is Industrial Air Ltd 266 Kentwood Hill at ground floor with residential flat at first floors.

There are two Fujitsu Air Conditioning Condensing units in the rear area at ground floor level as shown in Figure 3 of this report.

The units are at a substantial distance from the windows of the flat. The noise levels that will arise at the windows of the application site is calculated in this report. The evaluation shows that the noise is far below the recommendations of the BS 8233.

5. Calculations

5.1.2 Resultant Noise in Proposed Flats.

The noise level outside the windows of the proposed flats is calculated by the procedures in ISO 9613-2

The basic equation (3) from ISO 9613-2 for calculating noise level at a receiver location is

$$L = L_w + D_c - A$$

Where L_w is sound power at source

D_c is Directivity correction, zero in this case

A is attenuation from source to receiver.

Equation 4 gives $A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{misc}$

A_{div} is the attenuation due to distance given by equation 7

A_{atm} is attenuation due to atmospheric absorption, zero in this case

A_{gr} is ground effect, zero in this case

A_{bar} is attenuation due to barrier calculated by equations 16 and 17

A_{misc} is zero in this case.

Equation 7 gives $A_{div} = 20 \log d + 11$

A_{bar} is 0 for the windows in this case

BS 8233:2014 provides guidance on the evaluation of noise inside rooms with windows open, Annex G1 recommends that the noise level inside a room is 15dB below the external noise level when windows are open.

For this report 15dB is deducted from the external noise level to give the internal noise when windows are open.

The use of calculated noise levels is sufficient in this case because the results below show that the noise level is better than the BS 8233 recommendations by more than 10dB.

The calculations are as follows:

	For living room window of proposed flat at 264	Living
A	SWL at source dBA re 2×10^{-12} watts. As Fujitsu data sheet attached	62
B	Allowance for two units running simultaneously	3
C	d metres	5.7
D	A_{div} Eqn 7	26.0dB

E	A bar Eqn 13&15	0
F	Lp outside window A+B-D-E	39dBA
G	Noise reduction with window open by BS8233 Annex (G)	15dB
H	Resultant noise level inside with window open. F-G	24dBA
I	Criterion BS 8233 Table 4*	35 dBA

Thus, noise from the air condition units inside the flats with windows open will be more than 10dB below the recommendations of the British Standard and usual planning guidance.

Thus, noise from the air conditioning condensing units inside the room with windows open will be significantly below the recommendations of the British Standard and usual planning guidance.

6. Conclusion

The only sources of noise from commercial premises near the proposed flat are the air conditioning condensing units at the rear of Costcutters at 260 to 262 and at the rear of the Industrial Air Ltd at 266

The Costutter units are more than 16 metres distant and will have no discernible noise at the window of the proposed flat.

The units at rear of Industrial Air Limited are about 6 metres distant, these units will give rise to a noise level within the proposed flat of no more than 24dBA which is more than 10dB below the criterion recommended in BS 8233.

The Industrial Air premises is used for normal retail or associated office work. The units will not need to run at night or after 11 pm.

There are other existing residential flats at first floor to all the buildings. The proposed flat is at ground floor where any noise from nearby air conditioning units or any other commercial activity is reduced by acoustic shielding by fences or building outlines. The noise arising at the proposed flat will be below that at the existing first floor flats.

The proposed flat will be separated from adjacent premises at Industrial Air Limited and Costuctter by substantial solid brick walls more than 225mm thick. These walls will produce a sound reduction of at least 45dB $D_{nT,w} + C_{tr}$ and will require no further modification.

A new wall is to be constructed between the proposed flat and the shop that will continue to be in use. The wall will need to be constructed in accordance with Building Regulations Part E with a sound reduction of $45\text{dB } D_{nT,w} + C_{tr}$. This will be sufficient to ensure that the noise within the flat will be within the recommendations of BS 8233 provided the shop has no exceptional noise generating activities. Uses such as retail or hairdressing will necessitate no further measures.

The floor of the flat above the proposed flat will have to be constructed in accordance with Building Regulations Part E. to provide an airborne noise reduction of $45\text{dB } D_{nT,w} + C_{tr}$. This is a very high level of noise reduction and will ensure there is no audible noise within the flats during daytime.

The noise arising from commercial premises is therefore below the recommendations of BS 8233 and the usual planning guidance and accepted practice.

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22 February 2022

Figure 1 Plan of Proposed Flat

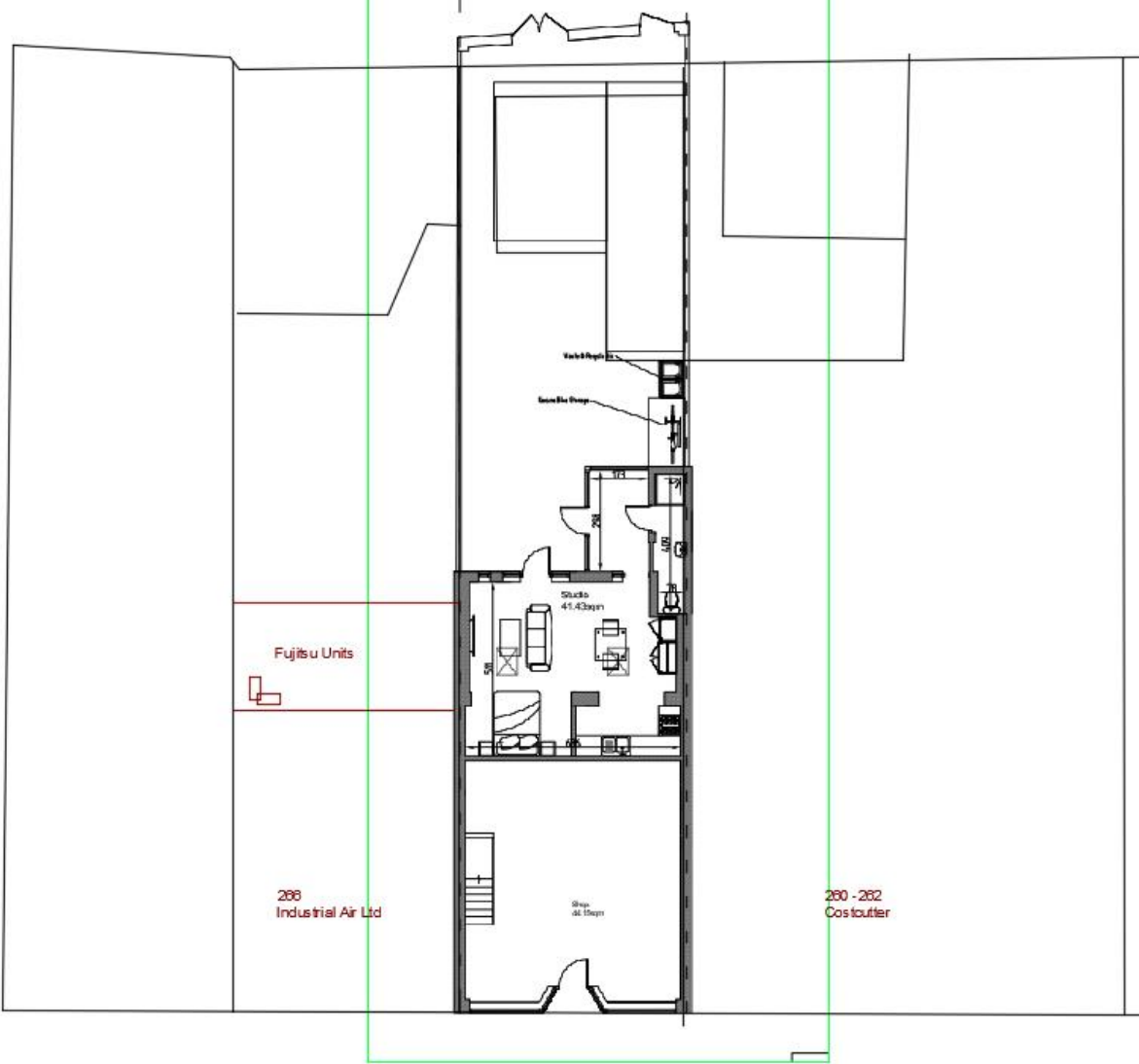


Figure 2 Plan at First Flor with Nearby Noise Sources.



Figure 3 Rear of Industrail Air Limited.



Figure 4 Rear of Costcutter



Figure 5 Rear of Costcutter Continued.



Figure 6 Fujitsu Technical Data Sheet

Specifications

Model No.			AOYG14KBT A2	AOYG18KBT A2
Power Source			Single phase, ~230V, 50Hz	
Nominal Capacity (min-max)	Cooling	kW	4.0 (1.4-4.6)	5.0 (1.7-5.8)
	Heating		4.4 (1.1-5.5)	5.6 (1.8-6.6)
Power consumption	Cooling / Heating	kW		
EER	Cooling	W/W	4.12	4.03
COP	Heating		4.63	4.59
Pdesign	Cooling/Heating (-10°C)	kW	4.0 / 3.5	5.0 / 4.2
SEER	Cooling	W/W	8.70	8.60
SCOP	Heating (Average)		4.70	4.70
Energy Efficiency Class	Cooling		A+++	A+++
	Heating (Average)		A++	A++
Annual Energy Consumption	Cooling	kWh/a	209	263
	Heating		1296	1434
Sound Pressure Level (High)	Cooling	dB(A)	47	47
	Heating		49	50
Sound Power Level (High)	Cooling		60	60
	Heating		62	62
Airflow Rate	Cooling/Heating	m ³ /h	1,670/1,670	1,960/2,020
Net Dimensions H × W × D		mm	542×799×290	632×799×290
Weight		kg(lbs)	33 (73)	37 (82)
Interconnecting Cable (Suggested cable size 1.5mm)			3 core + earth	
Suggested MCB Size			15	15
Max. Operating Current	Cooling/Heating	Amp	10.9	11.6
Starting Current			4.7	5.6
Power Supply To			Outdoor unit	
Connection Pipe Diameter	Gas	Inch	3/8 × 2	3/8 × 2
	Liquid		1/4 × 2	1/4 × 2
Max. Pipe Length		m	30 / 20	30 / 20
Max. Height Difference	Between Outdoor Unit and Each Indoor Units.		15	15
	Between Indoor Units.		10	10
Refrigerant	Type		R32	R32
	Charge	g	900	1020
	Additional Charge	g/m	20	20
Operation Range	Cooling	°CDB	-10 to 46	-10 to 46
	Heating		-15 to 24	-15 to 24