

219-229 SHAFTESBURY AVENUE

Noise Assessment Report

Reference: 13855.RP01.AR.0 Prepared: 19 September 2024 Revision Number: 0

Amber Properties Ltd.

T & T Management Services Limited 28 Irish Town Gibraltar GX11 1AA

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Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	19 September 2024	Aaron Moroney	Russell Richardson

Terms of contract:

RBA Acoustics Ltd have prepared this report in accordance with our brief issued over email dated 19 August 2024. RBA Acoustics Ltd shall not be responsible for any use of the report or its contents for any purpose other than that for which it was provided. Should the Client require the distribution of the report to other parties for information, the full report should be copied. No professional liability or warranty shall be extended to other parties by RBA Acoustics Ltd without written agreement from RBA Acoustics Ltd.

The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.



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1. INTRODUCTION

RBA Acoustics has been appointed by Amber Properties Ltd. to provide a noise impact assessment in relation to the change of use of first floor-level from the existing retail (Class E) at 219-229 Shaftesbury Avenue, London WC2H 8EL, to residential accommodation (Class C3). The first-floor level is currently tenanted by Optical Express, who also occupy the adjacent ground floor level. The building is a five-storey structure and already provides residential accommodation at second-floor level and above.

Conversion of existing premises to residential accommodation is permitted under the Town and Country Planning (General Permitted Development) (England) Order 2015 ('the GPDO') without the need for a full planning application process. Notwithstanding this, however, the 2021 amendment to the GPDO requires that, under Schedule 2 (Part 3), Class G, in order for the change of use of a building falling within Class E (commercial, business and service) of Schedule 2 to a use falling within Class C3 (dwellinghouses) of Schedule 1 to be permitted, the Applicant needs to consider the "impacts of noise from commercial premises on the intended occupiers of the development".

This report seeks to provide a review and assessment of the impacts of noise from commercial premises in the vicinity of the site.

This report occasionally employs technical acoustic terminology. In order to assist the reader, therefore, a summary of acoustic terms is presented in Appendix A.

2. SITE DESCRIPTION

The site is located in a mixed commercial/residential area. The east façade overlooks Shaftesbury Avenue, which is a busy road and separates the site from the nearby Shaftesbury Theatre and the triangular plaza where theatre patrons queue before shows. The west façade overlooks Dyott Street, which is a much quieter, one-way road and separates the site from the Google offices at 1-13 St Giles High Street. To the south is the busy junction of Shaftesbury Avenue and St Giles High Street (A40).

The nearest noise generating commercial properties to the first-floor area in question are considered to be Shaftesbury Theatre and the existing (to be retained) commercial premises at ground floor level of the site. With regards to Shaftesbury Theatre, it is considered appropriate to assess noise impact on the site from the gathering of guests in the plaza outside the entrance to the theatre before show times. Additionally, it is considered appropriate to assess the current level of airborne sound insulation between the ground and first-floor levels of the site, in order to verify that an appropriate level of protection can be provided to the new residential areas, whilst allowing a commercial unit to operate at ground floor level.

The location of the site and its surrounding area is shown in Figure 1 in Appendix C.

3. TOWN AND COUNTRY PLANNING (GENERAL PERMITTED DEVELOPMENT) (ENGLAND) ORDER 2015 (AS AMENDED)

Development) (England) Order 2015 (GPDO) is a statutory instrument, applying in England, that grants planning permission for certain types of development (such development is then referred to as permitted development). Schedule 2 of the GPDO 2015 specifies the classes of development for which prior approval is granted, and specifies the exceptions, limitations, and conditions that apply to some of these classes.

The GPDO 2015 did not require any consideration or assessment of environmental noise impacts on the future residential occupants of commercial office developments.

The 2021 Amendment to this Order, however, came into force on 21st April 2021 and placed an additional requirement allowing the local planning authority to consider noise impacts on the intended occupants of the development from nearby premises in commercial use, as reproduced below:

Conditions

MA.2.--(1) Development under Class MA is permitted subject to the following conditions.

(2) Before beginning development under Class MA, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to-

- (a) transport impacts of the development, particularly to ensure safe site access;
- (b) contamination risks in relation to the building;
- (c) flooding risks in relation to the building;
- (d) impacts of noise from commercial premises on the intended occupiers of the development;

Given the above, the purpose of this report is to address the requirements of the 2021 amendment to the Town and Country Planning (General Permitted Development) (England) Order 2015 in relation to the likely impacts of commercial noise upon the future residential occupants of the building. Noise from general environmental sources (e.g. transportation noise) does not require consideration or assessment for this application.

4. REVIEW OF EXISTING COMMERCIAL SOUND SOURCES

As mentioned in Section 2, there are two commercial sources of noise which are considered relevant to this assessment and thus, are addressed separately below. In order to review the existing sound sources on site, including the nature and impact of commercial sound sources affecting the application site, a site walkover was undertaken from 16:00 hours to 19:30 hours on Wednesday 4th September 2024 by Aaron Moroney, (BSc (Hons), MIOA) of RBA Acoustics.

4.1 Commercial Noise Impact – Shaftesbury Theatre

Patron activity outside Shaftesbury Theatre from 18:30 – 19:30 hours was monitored whilst stationed outside at the site perimeter at ground floor level. At this position, subjective observations were made of the noise climate throughout this time period.

The noise climate was noted to be completely dominated by local traffic passbys on Shaftesbury Avenue, with larger vehicles and motorbikes causing regular increases in local noise level. During periods where there was no moving traffic on Shaftesbury Avenue (i.e., either idling vehicles at the traffic lights or no vehicles at all), road traffic from other nearby roads provided a relatively constant underlying background noise level.

During the observation period, it was noted that large crowds of guests were gathering outside of Shaftesbury Theatre ahead of the 19:30 hours showing of Mrs. Doubtfire. This is shown in the photograph in Figure 2. Importantly, at no instance was it noted that any noise from patrons outside the Shaftesbury Theatre was audible at the observation position at the perimeter of the application site.

Given the presence of high levels of ambient and underlying road traffic noise at the site and the observations described in this section when patrons were outside Shaftesbury Theatre, it is also considered that noise break-out from within Shaftesbury Theatre during performances is unlikely to be an issue.

In light of the above findings, we would not consider the presence and operation of the Shaftesbury Theatre to be providing any adverse commercial noise impact to the application site.

4.2 Commercial Noise Impact – Ground Floor Retail Unit

The existing level of airborne sound insulation between the ground and first-floor level areas of the Optical Express unit at 219-229 Shaftesbury Avenue was measured between 16:00 – 17:30 hours on 4th September 2024. Drawings of the existing ground and first-floor levels are provided in Figures 3 & 4, with the test areas indicated on the plans.

At ground floor level, the majority of the floor space is currently allocated to a single open plan front of house space. The first floor is occupied by the same tenant and the two floor areas are connected by an open stair.

Performance Criteria

There are no specific Building Regulations requirements for sound insulation between commercial and residential areas. However, Approved Document E (2003 edition incorporating 2004, 2010 and 2015 amendments) sets the following requirements for the sound insulation performance of separating walls and floors between dwellings. The performance requirement is given in terms of a minimum weighted standardised level difference plus spectrum adaptation term $(D_{n,T,w} + C_{tr})$. The minimum level is shown below for each of the following instances:

- Between purpose-built dwelling-houses and flats: $45 dB (D_n \tau_w + C_{tr})$
- Between dwelling-houses and flats formed by material change of use: 43dB ($D_{n,T,w} + C_{tr}$)

Results

Airborne sound insulation testing of three areas of floor was undertaken to assess the existing performance offered by the floor separating the ground and first floor.

For more details of the airborne and sound insulation testing procedure and the equipment used, please see Appendices B and C.

Inevitably, the fact that the ground and first-floor areas are linked by an open stairwell, there will be a significant degree of flanking sound transmission via the stairwell, reducing the measured sound insulation performance.

- Test 1: The Consulting Room / Office at first-floor level had a door to isolate the room from the stairwell, which reduced flanking transmission to an extent. However, the performance was subjectively observed to be significantly compromised by noise flanking via the stairwell during the test, particularly at mid and high frequency.
- **Tests 2 & 3**: The Store / Staff Room and Test Room at first-floor level both had a door to isolate the room from the stairwell, which reduced flanking transmission to an extent. This was reduced further by an additional lobbied door at first floor level. Subjectively, flanking was observed to have a negligible effect on the measured performance for these tests.

Existing doors are shown on the plan in Figure 3. The test results are presented in Table 1. Test graphs are presented in Figures 5-7.

Test	Source Room		Receive Room		$D_{nT,w} + C_{tr}$	Comments
	Plot	Room	Plot	Room	(dB)	oominents
1	GF Opitcal Express	Open Plan Front of House	1F Optical Express	Consulting Room / Office	48	Notably compromised by flanking via stairwell
2	GF Opitcal Express	Open Plan Front of House	1F Optical Express	Store Room / Staff Room	55*	Negligible flanking
3	GF Opitcal Express	Open Plan Front of House	1F Optical Express	Test Room	55*	Negligible flanking

Table 1 – Measured Existing Sound Insulation Performance

*Results limited by background noise, therefore actual performance is likely to be slightly higher at some frequencies.

Discussion

The result of Test 1 is 3 dB above the basic Building Regulations requirement for airborne sound insulation between residential properties. When the open stairwell between the ground and first floors is removed we would expect this to be improved significantly.

The results of Tests 2 and 3 are 10 dB above the basic Building Regulations requirement for airborne sound insulation between residential properties.

At present, all tests exceed the minimum requirement typically adopted between dwellings formed by material change of use (as stated in Approved Document E) by 5-12dB. Usually, a 5dB betterment of the Approved Document E criteria would be recommended as a minimum for a light commercial/retail to dwelling adjacency. At present, all tests meet or exceed this criterion, prior to any works being undertaken.

Once the linking stairwell is removed (and thus flanking sound transmission via this path no longer dominates), we would expect the Test 1 performance to improve to a level similar to, or better than, the performance measured under Tests 2 and 3.

In light of the above findings, we consider the likely levels of airborne sound insulation between the ground and first floor units to be sufficient.

5. CONCLUSION

RBA Acoustics has been appointed to provide a noise impact assessment for the proposed conversion of the first-floor level of 219-229 Shaftesbury Avenue, London from an existing commercial unit (Use Class E) to residential accommodation (Use Class C3).

Conversion of existing commercial uses to residential accommodation is permitted under the Town and Country Planning (General Permitted Development) (England) Order 2015 ('the GPDO') without the need for a full planning application process. Notwithstanding this, however, the Applicant needs to consider the "impacts of noise from commercial premises on the intended occupiers of the development" in accordance with the requirements of Schedule 2 (Part 3), Class G of the 2021 amendment to the GPDO.

The site is located in a mixed commercial/residential area. The nearest noise generating commercial properties to the first-floor area in question are considered to be Shaftesbury Theatre and the existing (to be retained) commercial premises at ground floor level of the site. With regards to Shaftesbury Theatre, it has been considered appropriate to assess noise impact on the site from the gathering of patrons in the plaza outside the entrance to the theatre before show times. Additionally, it has been considered suitable to assess the current level of airborne sound insulation between the ground and first-floor levels of the site, in order to verify that an appropriate level of protection will be provided to the new residential areas, still allowing a commercial unit to operate at ground floor level.

We have reviewed the potential impacts of noise on the application site due to noise from these commercial operations.

At no time during the site visit was it noted that noise from guests outside the Shaftesbury Theatre was audible at the observation position at the perimeter of the application site.

The results of the sound insulation testing show a performance which exceeds the minimum requirement typically adopted between dwellings formed by material change of use (as stated in Approved Document E), even with significant levels of flanking via an open stairwell.

In light of these findings, there is a low risk of adverse impact due to noise transfer to the first floor area due to noise from these commercial operations.

Based on the above conclusions, it is our opinion that the suitability of the application site for residential occupation under Class MA of the Town and Country Planning (General Permitted Development) (England) Order 2015 (As Amended) has been determined.

Appendix A - Acoustic Terminology

A-weighting (e.g. dB(A))	A correction applied across the frequency bands to take into account the response of the human ear, and therefore considered to be more representative of the sound levels people hear.
Cır	A correction applied to a sound insulation quantity (e.g. $D_{n_{T,W}}$ or R_w), taking into consideration a sound spectrum with a notable low frequency component, such as road traffic.
DeciBel (dB)	Unit used for many different acoustic parameters. It is the logarithmic ratio of the level being assessed to a standard reference level.
Dntw	A single number quantity which characterises the airborne sound insulation between rooms. The higher this value is, the better the performance of the separating element.
Leq	The level of a notional steady sound which, over a stated period of time, <i>T</i> , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
LAeq, T	The A-weighted level of a notional steady sound which, over a stated period of time, <i>T</i> , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
Lan (e.g. La10, La90)	The sound level exceeded for n% of the time. E.g. L_{A10} is the A-weighted level exceeded for 10% of the time and as such can be used to represent a typical maximum level. Similarly, L_{A90} is the level exceeded for 90% of the measurement period, and is often used to describe the underlying background noise.

Appendix B - Instrumentation

The following equipment was used for the acoustic measurements.

	Table DT - Equipment Calibration Details			
Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1406255	11/ (020	18 April 2025
Norsonic Pre Amplifier	1209	20491	044039	
Norsonic ½" Microphone	1225	225529	44038	18 April 2025
Norsonic Sound Calibrator	1251	34391	U440373	18 April 2025
JBL Loudspeaker	EON715D	15069277411	N/A	N/A
NTI Minirator	MR2	G2L-RABWB-G0	N/A	N/A

Table B1 - Equipment Calibration Details

Appendix C – Methodology

General

The source rooms were complete, and the receiver rooms were furnished. Airborne and sound insulation tests were undertaken in areas which had recently undergone a change in floor finish to a newly laid hardwood floor.

The site measurements, analyses and presentations were undertaken in general accordance (as far as practicably possible) with the following British Standards as required by Approved Document E 2003 (as amended in 2015) of the Building Regulations 2010:

- Airborne Sound: BS EN ISO 140-4:1998 "Acoustics Measurement of sound insulation in buildings and of building elements – Part 4: Field measurements of airborne sound insulation between rooms"
- Airborne Sound: BS EN ISO 717-1:1997 "Acoustics Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation"

All the procedures in Annex B of Approved Document E of the Building Regulations were followed where possible.

Airborne Sound Insulation Test Method

The airborne sound insulation performance of the structures was determined by generating a broadband, random diffuse sound field in the source room and measuring the spatially averaged 1/3 octave band sound pressure levels in both the source and receive areas. The receive levels were corrected for the receive room background noise levels and reverberation time and then subtracted from the source levels to determine the level difference, D, over the frequency range 100-3150Hz.

For each test two separate source positions were used and spatially averaged noise levels within both the source and receive room were measured by means of a moving microphone over a sample period of 30 seconds for each source position.

Reverberant decays were also recorded in the receive room using the interrupted noise method to determine the reverberation times, T, over the same frequency range. Six decays in total were recorded at three different positions within the receive room and subsequently averaged.

The 1/3 octave band results were then compared with a standard curve, using the method described in BS EN ISO 717-1: 1997 to determine the single-figure descriptor of airborne sound insulation, the Weighted Standardised Level Difference, $D_{nT,w}$, and the spectrum adaptation term, C_{tr} .

Appendix D – Drawings and Test Graphs



Figure 1 – Site plan

219-229 Shaftesbury Avenue

19 September 2024



Not to Scale

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Figure 2 – Photograph of guests gathering outside of Shaftesbury Theatre (taken 19:08 hours, 4 September 2024)

219-229 Shaftesbury Avenue

19 September 2024



Not to Scale

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Figure 3 – Existing ground-floor level general arrangement

219-229 Shaftesbury Avenue

19 September 2024



Not to Scale

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Not to Scale

F Opitcal Express Open Plan FOH to 1F Optical Express Consulting Room / Offic

Standardised Level Difference According to ISO 140-4

Field Measurement of Airborne Sound Insulation Between Rooms

Construction Under Test: Separating floor construction



Rating according to BS EN ISO 717-1

$D_{nT,w}$ (C; C_{tr} 50 (-1; -2) dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method

Test undertaken by:

Client: Test Date: Amber Properties Ltd. 04/09/2024

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Project 13855 Figure 5

F Opitcal Express Open Plan FOH to 1F Optical Express Store Room / Staff Roor

Standardised Level Difference According to ISO 140-4 Field Measurement of Airborne Sound Insulation Between Rooms

Construction Under Test: Separating floor construction



Rating according to BS EN ISO 717-1

$D_{nT,w}$ (C; C_{tr} 61 (-1; -6) dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method

Test undertaken by:

Client: Test Date: Amber Properties Ltd. 04/09/2024

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Project 13855 Figure 6

GF Opitcal Express Open Plan FOH to 1F Optical Express Test Room

Standardised Level Difference According to ISO 140-4 Field Measurement of Airborne Sound Insulation Between Rooms

Construction Under Test: Separating floor construction



Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method

Test undertaken by:

Client: Test Date: Amber Properties Ltd. 04/09/2024

RBA Acoustics

Project 13855 Figure 7

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