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Acoustic Design Review

Separating Wall Sound Insulation

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Location: 1a-1b Wellington Street, Gravesend, Kent. DA12 1JA

Client: Veerpal Kaur

Document Submitted: 31/03/2026

Report Ref:	[VERB-002A]
Document Status	V001

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The report is limited solely to acoustic advice. Recommendations are made exclusively to support acoustic improvement and do not constitute advice on fire safety, thermal performance, structural integrity, or other building or regulatory compliance. It remains the client's responsibility to ensure that all other aspects of the design are reviewed by appropriately qualified professionals, including, where necessary, a structural engineer to verify the adequacy of proposed and existing elements to support any loads arising from acoustic treatments.

This report should be read in full and in conjunction with its appendices.



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1. Introduction

JG Acoustics Ltd has been instructed by the client to provide initial advice on appropriate sound insulation measures for the separating wall associated with the commercial and residential conversion at 1a–1b Wellington Street, Gravesend. The site was attended to undertake an initial sound insulation test of the existing wall, and the observations and results are summarised within this report. In addition, a technical review has been carried out of the separating wall and proposed build-up in line with the requirements of the Gravesham planning condition. Specifications for the wall treatment to improve acoustic performance are provided for implementation by the client's contractor.

The advice contained within this report is not exhaustive; further guidance should be sought directly from Building Regulations Approved Document E. A tolerance for workmanship and potential flanking paths, which this report seeks to minimise, has been allowed for by a nominal design margin of 8 dB. Verification shall be carried out by means of sound insulation testing at the pre-completion stage, in line with the local authority's condition.

James Gardner is a corporate member of the Institute of Acoustics (MIOA) and holds the Institute of Acoustics Diploma in Acoustic and Noise Control. He has also completed an MSc in Applied Acoustics with distinction and an undergraduate degree in Music (2009). James Gardner is registered under the UKAS accredited SITMA scheme for sound insulation testing.

This report relates solely to acoustic performance in accordance with Gravesham's planning condition and with further reference to Approved Document E of the Building Regulations. Recommendations concerning the design or modification of floors, walls, ceilings or other building elements are made exclusively to support acoustic improvement and do not constitute advice on fire safety, thermal performance, structural integrity, or compliance with any other regulatory standards. It remains the client's responsibility to ensure all other design aspects are reviewed by suitably qualified professionals. In particular, a structural engineer may need to confirm the adequacy of the existing structure to support any additional loads arising from acoustic treatments and recommendations.

2. Relevant Planning Condition – Gravesham Borough Council

Application: 20250866

[Condition] 3. Prior to the works commencing, a sound insulation assessment shall be carried out, submitted to and approved in writing by the Local Planning Authority. The Assessment shall include details of the assessment methodology and the sound insulation performance of the partition between the commercial and residential.

The sound insulation performance of partitions between the different uses, shall resist the transmission of airborne sound and impact sound to demonstrate that the minimum levels stated in the Building Regulations are capable of being complied with. The assessment will also include details of any proposed works to achieve these levels.

The construction that separates the residential and commercial unit shall aim to resist the transmission of airborne sound such that the weighted standardised difference (DnT, W + Ctr) shall not be less than 53 decibels (i.e. an enhancement of the minimum levels stated in the Building Regulations of 10dB). The assessment will also include details of any proposed works to achieve these levels.

Any works identified as being required in order to achieve these minimum levels shall be implemented and evidence provided (if necessary, by way of a further sound insulation assessment report) for approval by the Local Planning Authority prior to first occupation. Overheating and ventilation must also be considered in the design of any mitigation.

Reason: To protect the residential amenity of adjoining occupiers and in accordance with Policy CS19 of the Gravesham Local Plan Core Strategy (2014).

3. Initial Test

SITMA Test Report Reference Number: 106399

Test Date: 04/03/2026

Tester: James Gardner

For more information, please refer to the report in full. In summary the following was noted in the test report:

This report and the associated test have been prepared in accordance with the client's instructions and the requirements of the Local Planning Authority for testing of the separating commercial party wall prior to the commencement of works. This test report does not constitute pre-completion testing for the purposes of submission to Building Control. Further to the noted deviations, the following comments are provided: The residential receiving room (noted as the living room on the floor plans) is currently functioning more as a hallway with an open stairwell to the floor above, rather than as an enclosed room. This introduces additional uncertainty to the test result and is therefore considered a deviation from the standard test conditions. An internal wall on the commercial side has been demolished, creating an open area. As a result, the planned test room (which was previously enclosed) now includes a doorway passing through the separating wall into the neighbouring dwelling. This doorway is intended to be blocked up once the full works commence. Although the doorway does not open directly into the receiving test room (as there is an additional internal door), it introduces significant uncertainty and is considered a deviation from the standard test method. It was observed on site that flanking transmission through the doorways within the property was likely the main contributor to noise leakage, rather than transmission through the tested wall itself. Results are therefore indicative only for the purposes of the planning officer's request and are not considered to represent a fully compliant test. The test was undertaken prior to the commencement of works and is not intended for the discharge of Building Regulations requirements. The proposed works have not yet been fully undertaken or completed. It is understood that testing will be performed again at the pre-completion stage for relevant Planning and Building Control submission. The result (Pass) noted in this report only applies to the fixed Building Regulations Part E Material Change of Use requirements and not the requirement of the planning condition for an additional +10 dB in airborne performance.

Table 1 - Initial test result of separating wall.

Certificate Number	Plot & Source Room	Source Room Volume (m ³)	Plot & Receive Room	Receive Room Volume (m ³)	Target DnT,w+Ctr (dB)	Result DnT,w+Ctr (dB)	Result
276679	Unit 1 Commercial Space	120	Flat 1 Living Room	45	≥ 43	44	Pass
	Construction:	Existing brick party wall					
	Deviations:	Receive Room furnished; 6dB Rule not met. Please refer to the report notes section for details of the test arrangements, site conditions, and the deviations noted at the time of testing.					

A copy of the test certificate is provided in Appendix A.

The result indicates that the performance of the wall in its existing form will need to be improved to meet the minimum field performance requirement of DnT,w+Ctr (dB) 53 dB.

4. Separating Wall

Following initial site testing and a review of the existing conditions undertaken on 4th March 2026, it is considered that the current wall construction (with works ongoing) is unlikely to achieve the performance requirements set out in Planning Condition 3. Acoustic upgrades are therefore required.

The age and form of the building suggest pre-cavity construction, with solid masonry party walls typical of Victorian and early 20th century development. In the absence of confirmed architectural wall-type information, the separating wall between dwellings has been assumed to comprise solid masonry construction of 225 mm thickness. This assumption is considered reasonable on the basis that the structural engineer's report adopts a 300 mm loadbearing masonry wall for bearing design purposes, although the exact construction of the separating wall is not explicitly defined. The internal wall on the residential side was observed at attendance to be finished with plaster. The wall model is considered to form a continuous separating structure between adjoining properties.

The proposed wall treatment follows the principles of Type 1 treatment as set out in Approved Document E (change of use, p.59), with additional enhancements incorporated to improve performance beyond this minimum and provide a robust margin in relation to the planning condition.

It should be noted that in-situ performance is typically lower than laboratory-derived data due to workmanship, junction detailing, and flanking transmission paths. Accordingly, the proposed specification has been designed to provide an approximate 8 dB margin above the minimum Approved Document E requirement, allowing for such variability and increasing the likelihood of achieving the required performance on completion testing.

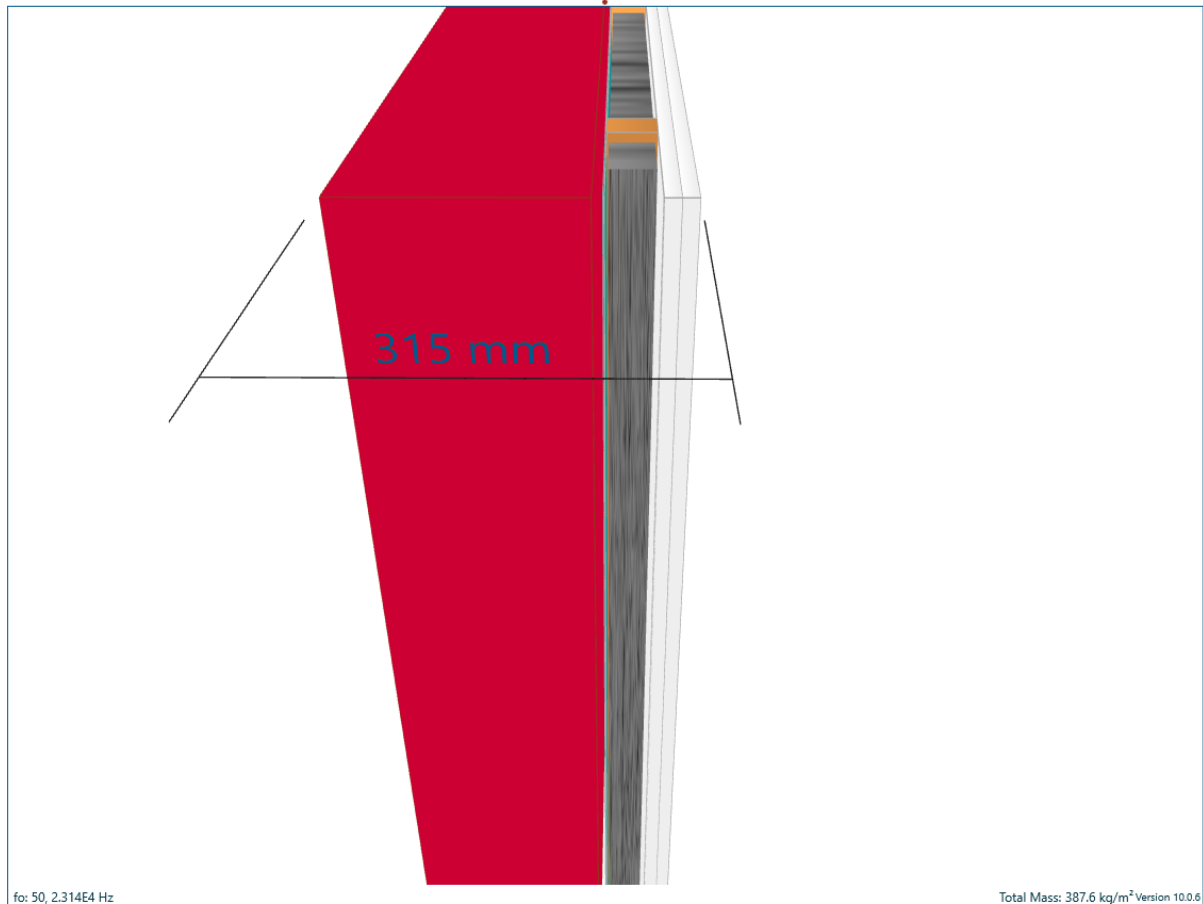
Based upon the client's drawings, discussions and site observations, the following minimum specification has been proposed for continuous separating walls. Calculations shown below in Figure 1 have been performed using INSUL software based on published laboratory data. Details of the proposed wall treatment construction is also shown.

63	125	250	500	1k	2k	4k
41	46	81	105	116	124	134

Rw 80 dB C -10
Ctr -19
Rw+Ctr 61 dB
100-3150 Hz

Description

Wall (Triple): + Panel 1: 1 x 225 mm Plastered Brick + Frame: None (no connections) (90 mm x 45 mm), Stud spacing 600 mm, Cavity Width 10 mm + (Empty cavity) + Panel 2: 1 x 0.4 mm No Panel (INSUL Placeholder) + Frame: Timber stud (50 mm x 45 mm), Stud spacing 600 mm, Cavity Width 50 mm + 50 mm Rockwool (48kg/m3) + Panel 3: 2 x 15 mm Gyproc SoundBloc 15mm + Details: Panel Size 2.7 m x 4.0 m



System description

Panel 1	1 x 225 mm Plastered Brick
Frame	None (no connections) (90 mm x 45 mm), Stud spacing 600 mm, Cavity Width 10 mm + (Empty cavity)
Panel 2	1 x 0.4 mm No Panel (INSUL Placeholder)
Frame	Timber stud (50 mm x 45 mm), Stud spacing 600 mm, Cavity Width 50 mm + 50 mm Rockwool (48kg/m3)
Panel 3	2 x 15 mm Gyproc SoundBloc 15mm
Details	Panel Size 2.7 m x 4.0 m, Partition surface mass = 388 kg/m ² , Mass-air-mass resonant frequency = : 50 Hz, 2.314E4 Hz

Figure 1 - INSUL Model of proposed wall treatment and details.

Further information:

- The additional lining may be installed on one side only as shown (i.e. within the commercial unit where works are taking place).
- The existing wall is plastered on both sides (residential side assumed to be dot and dab as a worst case).
- The commercial unit shall be lined with two layers of plasterboard (Gyproc SoundBloc 15 mm), installed with staggered joints.
- A gap shall be maintained from the masonry core. A minimum separation of 10 mm shall be provided between the masonry wall and the new timber frame, which shall remain isolated from the brick wall as an independent structure. A further cavity of 50 mm shall be formed within the timber frame, to be filled with Rockwool RWA45. This insulation shall not make contact with the existing brick wall.
- The 50mm insulation in the cavity is required to be a minimum density of 45 kg/m³ with an air gap (recommend Rockwool RWA45) to prevent levels increasing due to cavity resonance. This should fit tightly in between the frame but not fill the full cavity to allow for an air gap.

Do

- Ensure the independent panel and supporting frame are not in contact with the existing wall.
- Seal the perimeter of the independent lining with acoustic tape or sealant.

Do not:

- Do not tightly compress the absorbent material. Maintain an air gap (minimum 10mm) between the 50 mm mineral wool and the brick wall.

Under these conditions, and with flanking transmission appropriately controlled, the wall is anticipated to achieve the minimum performance requirement of $D_{nT,w} + C_{tr}$ 53 dB, as set out in Planning Condition 3. This is based on correct installation and adherence to good construction practices (please refer to further guidance within this document).

Internal Door to be Blocked Up:

The existing separating wall includes an access doorway into the residential dwelling. Following discussions with the client, it is understood that this will be blocked up, with a new access route provided to the front of the building, as indicated in the client's drawings (Appendix C).

Where this wall section is to be blocked, it shall be filled with solid dense masonry (brick or blockwork) of equivalent mass to the existing wall, and installed fully bonded without gaps or voids. The junction between new and existing construction shall be fully filled with mortar to ensure continuity of the masonry. As continuous brick construction has been assumed, any other lightweight areas or openings should also be infilled using solid dense masonry (brick or blockwork) of equivalent mass. Should further guidance be required, the client shall contact JG Acoustics to discuss.



Figure 2- Image showing the door currently in the separating wall that is to be filled.

All gaps, cracks and defects within the wall shall be made good using mortar, ensuring full filling of joints and continuity of the construction. Small holes may be packed densely with mineral wool where necessary and fully sealed over with mortar or render, ensuring no air paths remain.

The blocked-up surface, including all infill and repaired areas, shall be finished with a dense sand/cement render to provide a continuous and airtight seal. Particular attention shall also be paid to sealing at junctions, edges, and ceiling interfaces. The completed wall shall be continuous, with no residual gaps or cracks, ensuring that its mass and airtightness are consistent with the construction assumed within the INSUL model presented in Appendix D.

5. Flanking and Workmanship

Sound insulation between spaces is influenced not only by the performance of the separating wall or floor, but also by flanking transmission through surrounding elements, gaps and construction details, otherwise known as indirect sound. The total sound insulation is the result of both direct sound transmission (through the separating element) and indirect transmission (via weak areas or flanking paths). The weakest part of an adequately specified wall system is consistently the quality of workmanship, particularly in the details of junctions or edges where flanking noise is most likely to occur.

Service penetrations can significantly compromise acoustic performance if not properly controlled. As a guiding principle:

- Service routes should avoid breaching the separating wall.
- Where present, such services must be fully boxed in. Gas, electrical and all services must comply with relevant regulations and standards.
- Flanking strips should be installed, allowing the skirting boards to rest on top of the strip before abutting the wall to maintain acoustic isolation between the floor and wall.
- Similarly, a small gap should be maintained between the plasterboards and the floor deck to avoid a rigid connection; this gap should be filled with an acoustic mastic/sealant prior to skirting and flanking strip installation.

Other Key Considerations

- Plug sockets, switches, and other services should not be installed back-to-back on either side of a separating wall – and are best avoided on this wall.
- Perimeter seals are recommended for doors to limit sound transfer; however, no shared internal corridors or separating doors are identified, other than for external access.
- If shared ventilation systems are used (not proposed), they should be fitted with silencers or acoustic breaks to prevent sound transfer between spaces. An additional acoustic review may be required.
- It has been assumed that the ground floor construction is solid, with no cavity below extending into the adjoining premises. If a cavity or floor area below is present, further detail will be required to ensure that this does not act as a flanking transmission path.
- Suspended ceilings or raised floors should be discontinuous across separating elements unless specifically designed to maintain acoustic separation.
- Cavity stops must be installed at all junctions involving separating walls and floors, particularly within external walls, to block potential flanking paths.
- The effectiveness of flanking control depends heavily on workmanship. Acoustic details must be followed precisely on site, and all gaps, cracks and unintended openings must be identified and sealed as part of the normal construction process to achieve the required performance.

6. Validation Testing

The client is advised that airborne sound insulation testing is required in line with Condition 3 to verify that the field performance can be demonstrated prior to first occupation.

Airborne sound insulation tests shall be performed in accordance with the methodology of BS EN ISO 140-4:1998. In line with the standards and requirements of SITMA/ UKAS, all equipment shall be lab calibrated to UKAS standards and measurement equipment shall be field calibrated before and after use. Additional checks that are required under the UKAS accredited SITMA scheme are also observed (such as the use of a dodecahedrons with directivity checks). James Gardner MSc MIOA is a certified tester with SITMA. SITMA is also a UKAS Accredited Certification Body No. 10579.

The testing scheme for the purpose of verification and discharge of Condition 3 shall consist of one airborne test of the separating wall.

Testing will only proceed if the development meets the requirements to test, noting the conditions outlined in Table 2, or as marked as deviations where able to proceed. Typically, testing is conducted once all trades have completed work, except for decorators and carpet and engineered floor installation. JG Acoustics advises clients that failure to meet these conditions may result in an aborted test (unable to be performed) and/or rejection of the test report by the approving authorities.

Table 2- General Site Requirements for Sound Insulation Testing.

Site Conditions for Compliant Testing and Requirements
Quiet conditions are required on site for testing.
During testing, each room being tested must be vacated by all occupants and other trades.
No power tools shall be operating in the nearby vicinity.
240V power is to be available in all test rooms.
Doors are correctly fitted to all rooms being tested.
Windows are fully fitted and can be closed.
Skirting boards, plugs and other switches are fitted.
If impact tests are required on party floors, carpets should not be fitted.
Access is to be arranged by the client to all dwellings for testing. Should a schedule not be prior arranged, access should be available to all dwellings to select an appropriate test sample.
Access is required to both sides of the floor or wall requiring testing. The client shall ensure access is prior arranged and permitted to any third party owned dwellings.
No animals, children or other personnel are permitted in the rooms undergoing testing.
All rooms should be clean, clear and unobstructed by furniture or other materials. Should this not be possible this should be prior arranged with Building Control for prior approval.
If there are party floors, are they of varying construction methods?
If there are party walls, are they of varying construction methods?
Relevant health and safety procedures have been provided for the site being tested including prior notice of any required inductions.

The client is advised to contact JG Acoustics Ltd at the pre-completion stage to undertake validation testing, in order to confirm whether the requirements of Planning Condition 3 have been achieved. The results shall then be submitted to the Local Planning Authority for discharge of the condition.

Appendix A – Investigative Test Sample

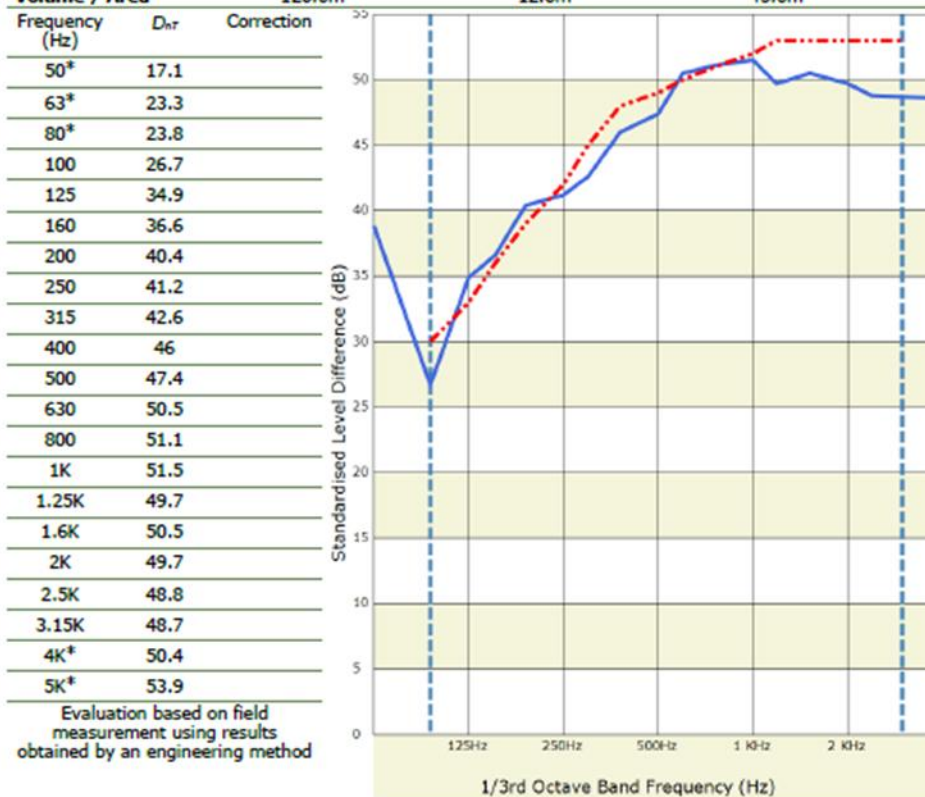
Sound Insulation Test Report No: 106399
1A, 1B, Wellington Street, Gravesend, 1A, 1B, Wellington Street

SITMA 
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Registered Sound Insulation Test Certificate

Test No:	276679	Test Job Ref:	106399	Test Org Name:	JG Acoustics Ltd
Customer:	Veerpal kaur	Job Address:	1A, 1B, Wellington Street, , Gravesend	Test Type:	Airborne (Wall)
Address:	21 cross lane east, , Gravesend	Postcode:	DA12 5HD	Test Date:	04/03/2026
				Tester:	James Gardner
				Site type:	Material Change of Use
				Site Build:	Dwelling-House/Flat

Description:	Source Room:	Partition:	Receiver Room:
Unit 1 Commercial Space	Unit 1 Commercial Space	12.0m ²	Flat 1 Living Room
Volume / Area	120.0m ³		45.0m ³



*Denotes Measurement outside the testers scope of certification & the scope of the SITMA Accreditation.	Above graph shows frequency range according to the curve of reference values within BS EN ISO 717-1
D _{nt,w} (C; C _v) [dB]: 49 (-2, -5) dB	PASS
D _{nt,w} + C _v [dB]: 44 dB	Adverse Aggregated Deviations [dB]: 28.2
Minimum Pass Level [dB]: 43 dB	

Partition Detail: Existing brick party wall.

Test Exceptions (if any): Receive Room furnished, 6dB Rule not met, Please refer to the report notes section for details of the test arrangements, site conditions, and the deviations noted at the time of testing.

AIRBORNE SOUND INSULATION TEST: Approved Document E (2003) including 2004, 2010, 2013, and 2015 Amendments
BS EN ISO 140 - Part 4:1998: Acoustics - measurement of sound in buildings and of building elements
BS EN ISO 717 - Part 1:1997: Acoustics - rating of sound in buildings and of building elements

Appendix B – Site Photographs 04/03/26 and Notes

The following photographs are not exhaustive and are based on non-invasive observations carried out during the site visit. It is recommended that similar considerations be applied across the remainder of the development site.



Figure 4-Initial site test and conditions.



Figure 5- Structural beam installed into separating wall. Ensure any gaps are adequately sealed.



Figure 6 – Current separating wall condition during site visit and test.



Figure 7- Existing front of the building.

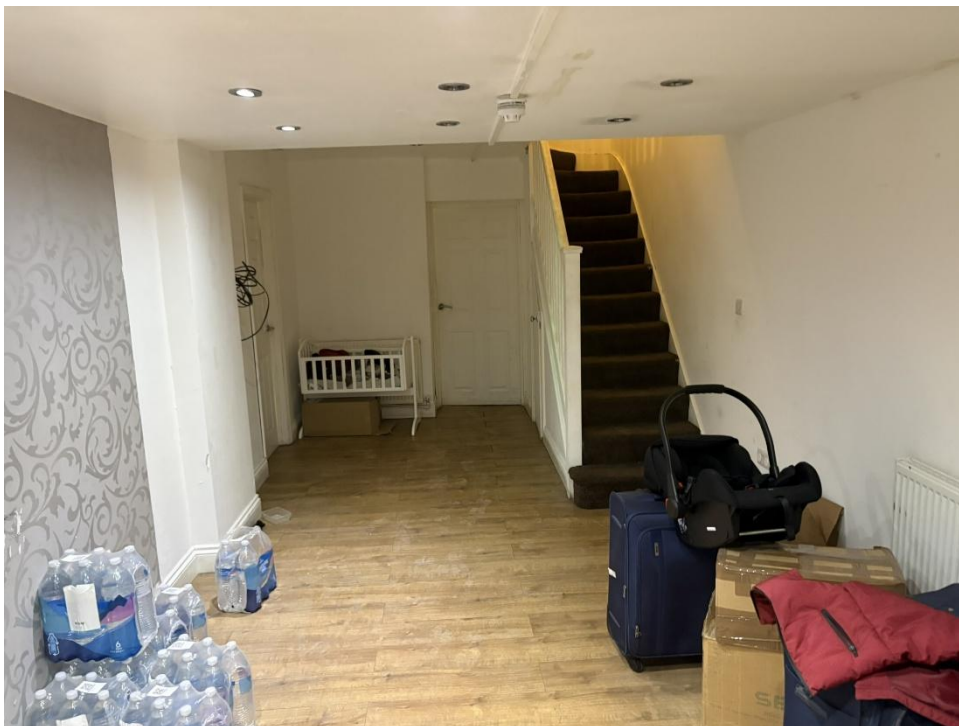
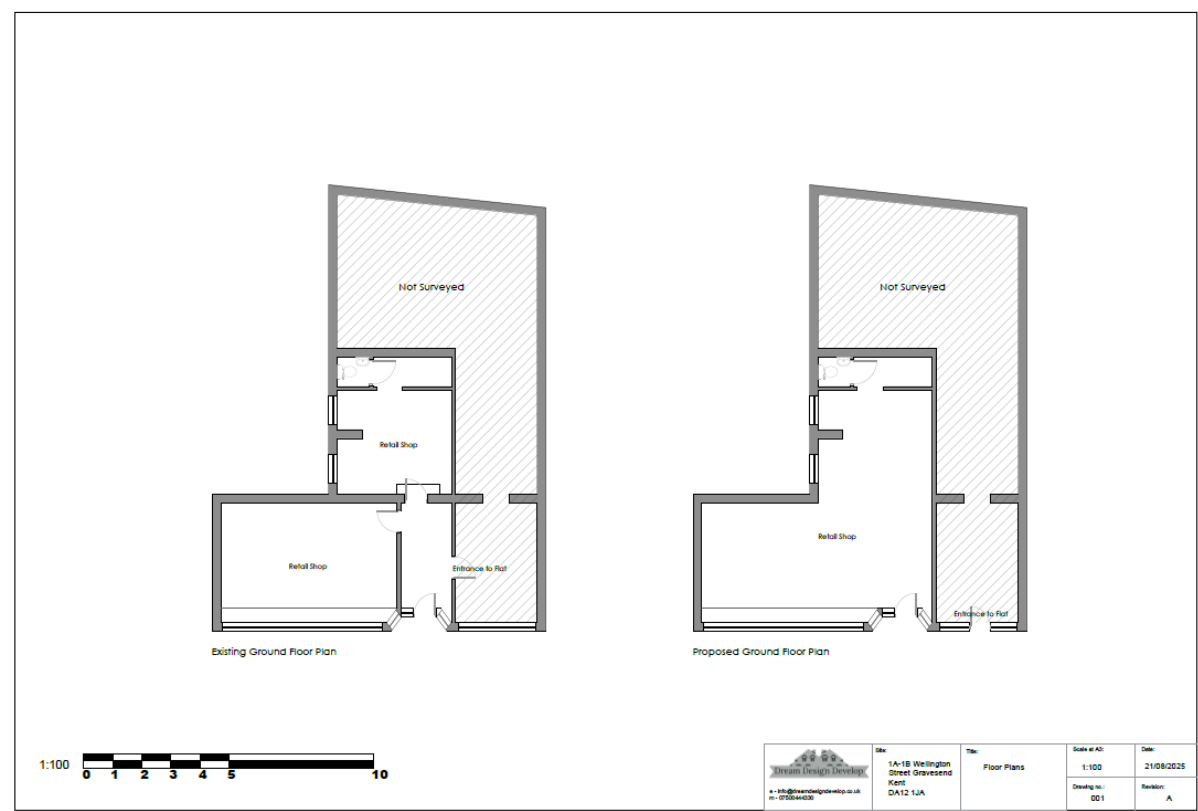


Figure 8- Receiving residential room on other side of separating wall.

Appendix C – Client Floor Plans



Floor plan provided by the client via email 20/03/2026.

Appendix D – Proposed Wall Treatment (INSUL)

Sound Insulation Prediction (v10.0.6)

Program copyright Marshall Day Acoustics 2023 | Margin of error is generally within $R_w \pm 3$ dB

Date: 30/03/2026

Job Name:



R_w 80 dB

C -10 dB

Ctr -19 dB

System description

Panel 1 1 x 225 mm Plastered Brick
Frame None (no connections) (90 mm x 45 mm), Stud spacing 600 mm, Cavity Width 10 mm + (Empty cavity)
Panel 2 1 x 0.4 mm No Panel (INSUL Placeholder)
Frame Timber stud (50 mm x 45 mm), Stud spacing 600 mm, Cavity Width 50 mm + 50 mm Rockwool (48kg/m³)
Panel 3 2 x 15 mm Gyproc SoundBloc 15mm
Details Panel Size 2.7 m x 4.0 m, Partition surface mass = 388 kg/m², Mass-air-mass resonant frequency = : 50 Hz, 2.314E4 Hz

freq. (Hz)	R (dB)	Roct (dB)
50	41	
63	43	41
80	39	
100	41	
125	54	46
160	65	
200	77	
250	87	81
315	95	
400	102	
500	106	105
630	110	
800	114	
1000	117	116
1250	120	
1600	122	
2000	125	124
2500	128	
3150	130	
4000	135	134
5000	139	

