Philip Dunbavin Acoustics Ltd
3 Bridgewater Court
Barsbank Lane
Lymm
WA13 0ER

ACOUSTIC CONSULTANTS

CL/J006115/9413/02

12 March 2026

Andy Thomas
Downing Construction Limited
5th floor, 1 Old Hall Street
Liverpool
Merseyside
L3 9HF

By email: andythomas@downing.com

River Street Tower, 2 River Street, Manchester – Acoustic Assessment

Background

Downing Construction Limited has proposed a change of cladding at the River Street Tower, 2 River Street, Manchester, M15 5GQ project. The proposal is to replace Proteus glass panels with aluminium rainscreen cladding with polyester powder coat finish. PDA Ltd has been commissioned to appraise the acoustic performance of the proposed change in cladding elements.

Proposals

The following existing external wall construction is in place at the above building:

- 5mm Proteus glass cladding system on Proteus GL system bracketry with 120mm mineral fibre insulation in the cavity, on an SFS framework lined externally with 12mm Siniat board and 100mm mineral fibre insulation, and lined internally with 2 no. layers of 15mm Soundbloc plasterboard.

The following change in the external wall construction is proposed:

- 3mm Proteus aluminium cladding system on Proteus SC system bracketry with 120mm mineral fibre insulation in the cavity, on an SFS framework lined externally with 12mm Siniat board and 100mm mineral fibre insulation, and lined internally with 2 no. layers of 15mm Soundbloc plasterboard.

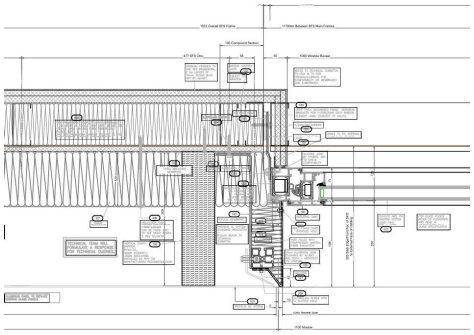
It is only proposed to replace the glass cladding system with the new proposed system at the above project. It is not proposed to replace the existing Cor-ten Rainscreen Cladding (Steel) or brickwork elements of the external wall façade.

It is noted that there locations where there are structural concrete columns/RC walls in place of the SFS inner leaf.

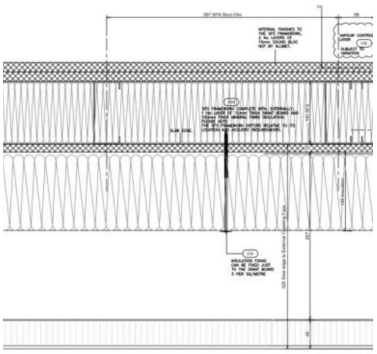
Sound Insulation Assessment

We have been provided with the following detail extracts for the proposed external wall construction (see Appendix B).

Proposed Aluminum Cladding



Existing Glass Cladding



The sound insulation of the build-ups have been compared using Insul Sound Insulation Prediction Software V9, with the calculated datasheets presented in Appendix C. The laboratory sound insulation R_w (and $R_w + C_{tr}$) is in general accordance with BS EN ISO 10140-2 (laboratory measurement of airborne sound insulation) and rated in accordance with BS EN ISO 717-1.

The calculations would indicate the following:

SFS location

- The calculated laboratory sound insulation for the external wall with the current glass cladding system, and an SFS inner leaf, is 53 dB R_w (50 dB $R_w + C_{tr}$).
- The calculated laboratory sound insulation for the external wall with proposed aluminium cladding system, and an SFS inner leaf, is 53 dB R_w (50 dB $R_w + C_{tr}$).

Concrete location

- The calculated laboratory sound insulation for the external wall with the current glass cladding system, and concrete structural element, is 65 dB R_w (59 dB $R_w + C_{tr}$).
- The calculated laboratory sound insulation for the external wall with proposed aluminium cladding system, and concrete structural element, is 65 dB R_w (59 dB $R_w + C_{tr}$).

Table 1. Calculated Sound Insulation performance for existing and proposed cladding systems

Performance indicator	SFS Location		Concrete Location	
	Existing glass cladding	Proposed aluminium cladding	Existing glass cladding	Proposed aluminium cladding
R_w dB	53	53	65	65
$R_w + C_{tr}$ dB	50	50	59	59

Conclusion

Calculations of the sound insulation provided by the current Glass rainscreen cladding and proposed aluminium cladding systems have been undertaken. The assessment would indicate that there would be negligible change in acoustic performance from one system to the other.

We would therefore suggest that there would be negligible change in the acoustic impact upon the existing residential units within the building. All calculations assume good standards of workmanship, etc. from all involved trades.

If you have any queries with the above, then please do not hesitate to contact me.

Letter Report Prepared By:-

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C Lalley BSc (Hons), MSc, MIOA
Senior Consultant

Letter Report Checked By:-

……
L Kavaney MIOA
Senior Consultant

APPENDIX A – DEFINITION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) Leq or 50 dB L_{Aeq}. Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and L_{eq}(s)

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq}, or for A-weighted figures dB(A) L_{eq} or dB L_{Aeq}. It can also be expressed in terms of frequency analysis (see later). L_{eq}(s) is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n, or for A-weighted figures dB(A) L_n or dB L_{An}. It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically it is the median.

L_{max}

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) L_{max}, dB L_{Amax}, etc. It can also be expressed in terms of frequency analysis.

Reverberation Time

This is the most common way of expressing a room's basic acoustic character. It is defined as the duration required for the space-averaged sound energy density in an enclosure to decrease by 60 dB after the source emission has stopped, denoted as RT_{60}. It is usually impractical to measure a full 60 dB dynamic range in the field; a smaller dynamic range may be used extrapolated to a decay time of 60 dB. Common derivations include a range between 5 dB and 25 dB below the initial level, which is labelled T_{20}, or the range between 5 dB and 35 dB below the initial level, labelled as T_{30}.

Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq}, L_{90}, L_{max} etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.

Sound reduction index (R)

This is a measure in decibels (dB) of the sound insulation of a particular construction. It is a laboratory measured parameter independent of area, and of receiving room conditions. The sound reduction index is the value produced from laboratory tests on a construction. When tested in a laboratory, results of R are obtained over a range frequencies in 1/3rd and/or full octave bands. These may then be weighted in accordance with BS EN ISO 717: 1997: Part 1 to give the overall *Weighted Sound Reduction Index* R_w. Where sound reduction with respect to road traffic noise is required the frequency weighting may be adapted using the C_{tr} spectrum adaptation term. In this case the single figure value is given in terms of $R_w + C_{tr}$.

Standardised level difference (D_{nT})

This is the level difference adjusted to assume a standard reverberation time of 0.5 seconds in the receiving room so that partitions can be compared independent of the furnishing and surface finishes of the rooms. The measure is generally used in residential testing as 0.5 seconds is taken as the approximate reverberation time of a furnished living room or bedroom. The D_{nT} is usually quoted for 1/3rd octave bands between 100 Hz and 3150 Hz.

Weighted standardised level difference ($D_{nT,w}$)

The $D_{nT,w}$ is a single figure expression used to describe the sound insulation of a partition. The weighting system used to obtain the single figure $D_{nT,w}$ from the 1/3rd octave D_{nT} values is given in BS EN ISO 717: Part 1. The $D_{nT,w}$ is used for expressing sound insulation measured “in the field”, and is part of the term used in Approved Document E 2003, guidance to the Building Regulations for the assessment of performance of separating elements between residences.

Spectrum adaptation terms (C, C_{tr})

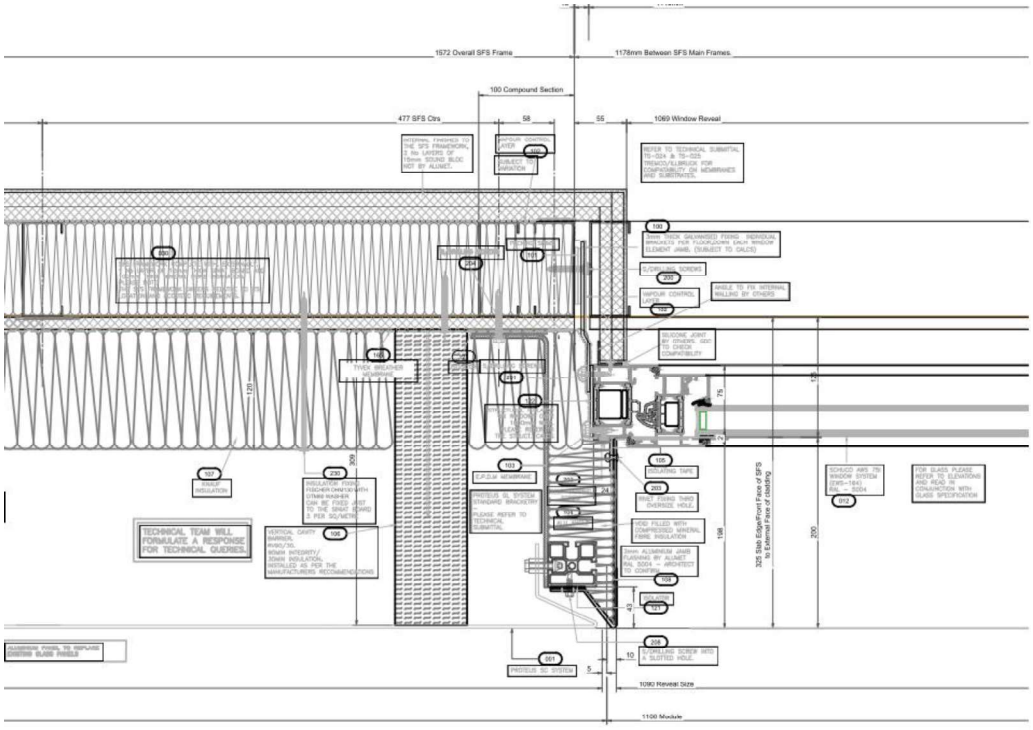
These terms are single figure values which are added to a single figure R_w or D_w term to adapt the frequency weighting for different source noise spectra. Adding the C_{tr} term to a weighted parameter approximates to the human perceived sound insulation of an element when subjected to road traffic noise. The C_{tr} term may be used to determine a single figure approximation of sound insulation against road traffic noise. The C_{tr} term is part of the term used in Approved Document E: 2003 of the Building Regulations for the assessment of performance of separating elements between residences.

Flanking

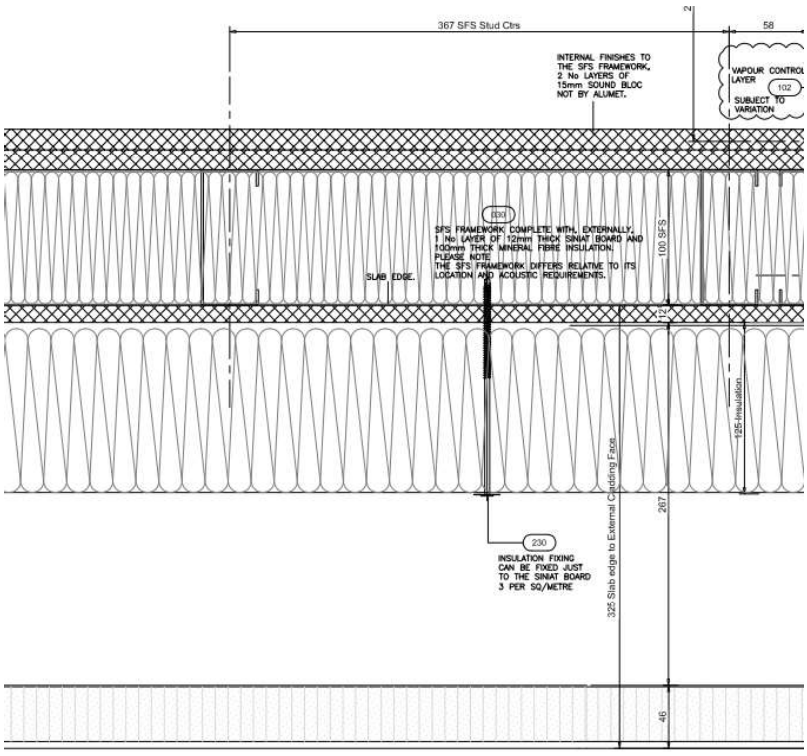
Flanking is the term used to describe how sound gets from one room to another by routes other than via the wall or floor directly separating them. Such flanking paths around a party wall would be the internal leaf of the external wall or the roof void, plus any air gaps at junctions. The sound insulation of flanking paths is very important. If the insulation is poor it can result in a poor built performance in terms of sound insulation, even if the party walls or floors themselves are adequate. When a measurement of sound insulation is made in a building as opposed to an acoustic laboratory, it will include flanking sound transmission. Standards for sound insulation in residential properties now require testing of $D_{nT,w} + C_{tr}$ values which include sound transmission via flanking paths.

APPENDIX B – Architectural Drawing Extracts

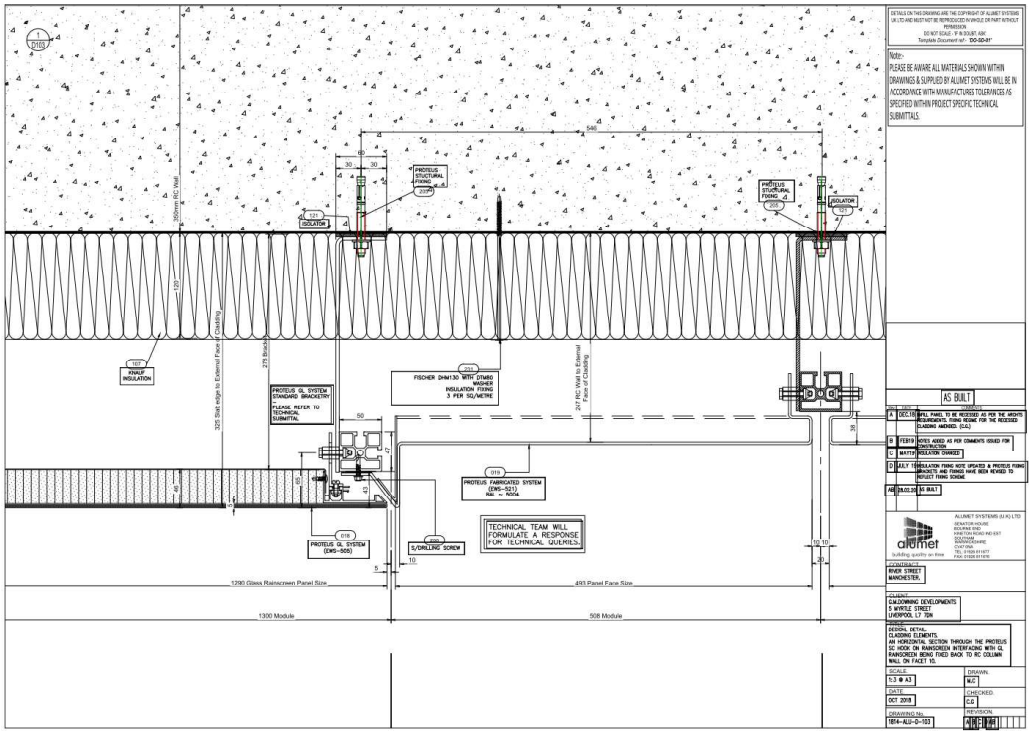
Proposed Aluminium Cladding



Existing Glass Cladding (SFS frame location)



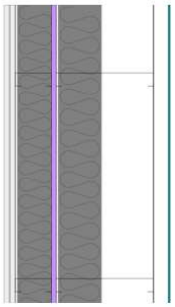
Existing Glass Cladding (Concrete frame location)



APPENDIX C – Insul Sound Prediction Extracts

Sound Insulation Prediction (v9.0.24)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within Rw ±3 dB
- Key No. 5527
Job Name:
Job No.: Initials:chrislalley
Date:05/03/2026
File Name:insu



Notes:

Rw 53 dB
C -2 dB
Ctr -3 dB

Mass-air-mass resonant frequency = =29 Hz , 76 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 59.4 kg/m²

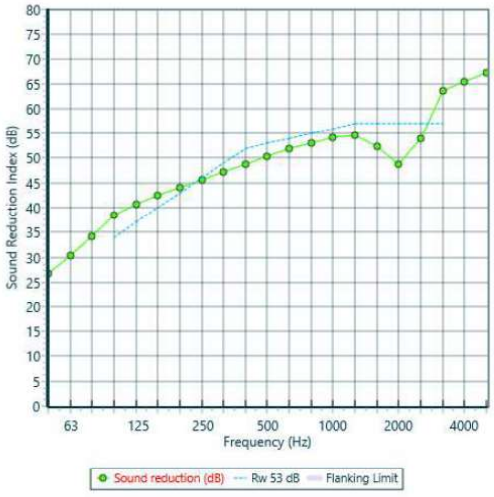
System description

Panel 1 : 2 x 15 mm Gyproc SoundBloc 15mm

Frame: Steel Stud (1.0-1.6mm) (1E2 mm x 38 mm), Stud spacing 600 mm ; Cavity Width 100 mm , 1 x fibreglass (10kg/m3) Thickness 100 mm
Panel 2 : 1 x 12.5 mm Siniat Weather Defence 12.5mm

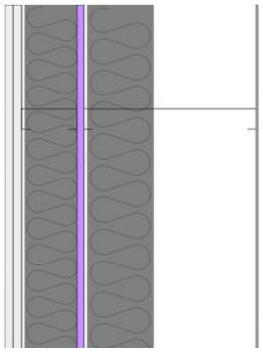
Frame: Steel Stud (1.0-1.6mm) (2.7E2 mm x 38 mm), Stud spacing 600 mm ; Cavity Width 267 mm , 1 x fibreglass (10kg/m3) Thickness 120 mm
Panel 3 : 1 x 46 mm Glass Panel

freq.(Hz)	R(dB)	R(dB)
50	27	
63	30	29
80	34	
100	38	
125	41	40
160	42	
200	44	
250	46	45
315	47	
400	49	
500	50	50
630	52	
800	53	
1000	54	54
1250	55	
1600	52	
2000	49	51
2500	54	
3150	64	
4000	65	65
5000	67	



Sound Insulation Prediction (v9.0.24)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within Rw ±3 dB
- Key No. 5527
Job Name:
Job No.: Initials:chrislalley
Date:02/03/2026
File Name:insu



Notes:

Rw 53 dB
C -1 dB
Ctr -3 dB

Mass-air-mass resonant frequency = =37 Hz , 76 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 46.9 kg/m²

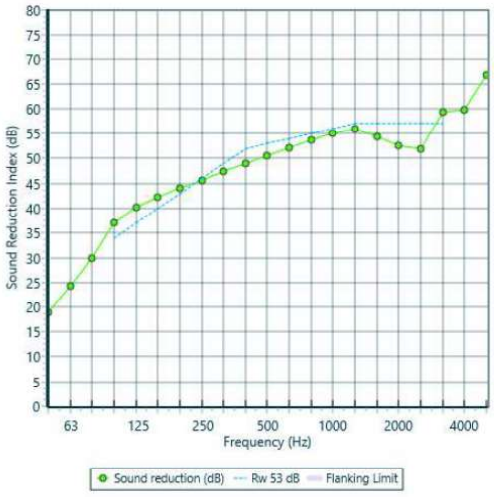
System description

Panel 1 : 2 x 15 mm Gyproc SoundBloc 15mm

Frame: Steel Stud (1.0-1.6mm) (1E2 mm x 38 mm), Stud spacing 600 mm ; Cavity Width 100 mm , 1 x fibreglass (10kg/m3) Thickness 100 mm
Panel 2 : 1 x 12.5 mm Siniat Weather Defence 12.5mm

Frame: Steel Stud (1.0-1.6mm) (3.1E2 mm x 38 mm), Stud spacing 600 mm ; Cavity Width 309 mm , 1 x fibreglass (10kg/m3) Thickness 120 mm
Panel 3 : 1 x 3 mm Aluminium

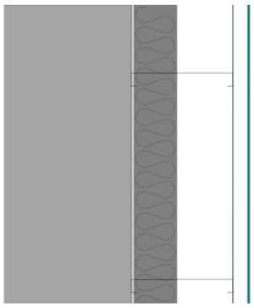
freq.(Hz)	R(dB)	R(dB)
50	19	
63	24	22
80	30	
100	37	
125	40	39
160	42	
200	44	
250	46	45
315	47	
400	49	
500	51	50
630	52	
800	54	
1000	55	55
1250	56	
1600	54	
2000	53	53
2500	52	
3150	59	
4000	60	61
5000	67	



Sound Insulation Prediction (v9.0.24)

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Margin of error is generally within Rw ±3 dB
- Key No. 5527
Job Name:
Job No.:
Initials:chrislalley
Date:05/03/2026
File Name:insu

Notes:



Rw 65 dB
C -2 dB
Ctr -6 dB

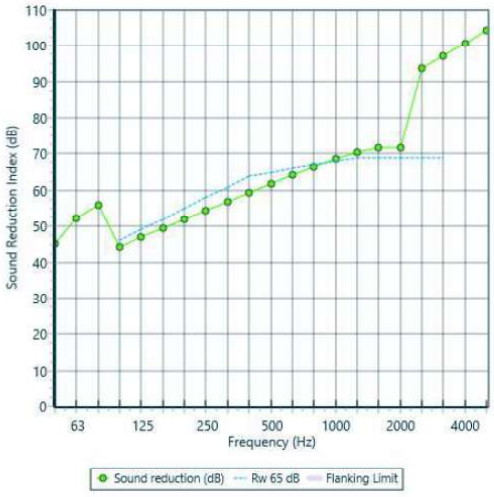
Mass-air-mass resonant frequency = =21 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 841 kg/m²

System description

Panel 1 : 1 x 350 mm Concrete

Frame: Steel Stud (1.0-1.6mm) (2.8E2 mm x 38 mm), Stud spacing 600 mm ; Cavity Width 278 mm , 1 x fibreglass (10kg/m3) Thickness 120 mm
Panel 2 : 1 x 46 mm Glass Panel

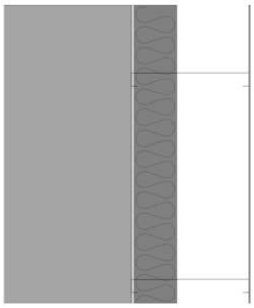
freq.(Hz)	R(dB)	R(dB)
50	45	
63	52	49
80	56	
100	44	
125	47	46
160	49	
200	52	
250	54	54
315	57	
400	59	
500	62	61
630	64	
800	67	
1000	69	68
1250	71	
1600	72	
2000	72	73
2500	93	
3150	97	
4000	101	100
5000	104	



Sound Insulation Prediction (v9.0.24)

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Margin of error is generally within Rw ±3 dB
- Key No. 5527
Job Name:
Job No.: Initials:chrislalley
Date:05/03/2026
File Name:insu

Notes:



Rw 65 dB
C -1 dB
Ctr -6 dB

Mass-air-mass resonant frequency = =31 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 829 kg/m²

System description

Panel 1 : 1 x 350 mm Concrete

Frame: Steel Stud (1.0-1.6mm) (3.2E2 mm x 38 mm), Stud spacing 600 mm ; Cavity Width 322 mm , 1 x fibreglass (10kg/m3) Thickness 120 mm
Panel 2 : 1 x 3 mm Aluminium

freq.(Hz)	R(dB)	R(dB)
50	47	
63	53	50
80	57	
100	44	
125	47	46
160	49	
200	52	
250	54	54
315	57	
400	59	
500	62	61
630	64	
800	67	
1000	69	69
1250	72	
1600	74	
2000	76	76
2500	78	
3150	79	
4000	80	81
5000	103	

