



Easton Beving,
Wassell Grove Business Centre,
Wassell Grove Lane,
DY9 9JH

Our reference: 10045/PR
Date: 16th December 2022

Dear Anthony,

10045, 360 Manchester, Rice Street

Acoustic Advice on Proposed Façade Claddings

As requested, please see below the sound insulation analysis carried out to the different existing and proposed cladding systems at the above address. A theoretical analysis was made using the proprietary sound insulation software INSUL.

Some of the specific existing/ proposed products used are not available within the INSUL software library, however, similar products were used instead.

Please note that the software is based on assumptions that cannot reproduce the performance when tested in laboratory conditions or represent certain noise behaviour features and is generally a simplification of a more complex system. Therefore, the results should be used with care and only as a comparison between the existing and proposed systems from the theoretical point of view. In some cases, INSUL results for a proposed system may indicate a significantly higher and more favourable result compared to the same system when tested in a laboratory. The results according to INSUL have typically a margin of error of $\pm 3\text{dB}$. Nevertheless, this is considered negligible when comparing both systems, existing and proposed from the theoretical point of view and where the aim is to determine the increase or decrease of sound insulation performance.

The analysis carried out below demonstrates that the proposed systems are expected to provide better sound insulation performances (sound insulation index R_w) and are not expected to result in a lower site sound insulation performance when compared to current installed cladding. The results obtained for the different cladding systems are shown below.

1. Existing & Proposed Zinc Systems

Existing Zinc System – $R_w60\text{dB}$

- 2x 12.5mm wallboard (assumed 8kg/m^2 each board)
- 100mm mineral wool (assumed 10kg/m^3)
- 150mm SFS metal stud
- 30mm Lafarge sheathing board (assumed 910kg/m^3 / 27.3kg/m^2)
- Breather membrane (ignored from acoustic modelling)
- 50mm timber studs (Air Gap)
- 22mm gapped timber boards (ignored from acoustic modelling due to gaps)
- 1.5mm Standing Seam Zinc (7135 kg/m^3 / 10.7kg/m^2)



Proposed Zinc System– RW 66dB

- 2x 12.5mm wallboard (assumed 8kg/m² each board)
- 150mm mineral wool (assumed 10kg/m³)
- 150mm SFS metal stud
- 12mm RCM Y-Wall sheathing board (assumed 1275kg/m³/ 15.3kg/m²)
- Breather membrane (ignored from acoustic modelling)
- 30-80mm Air Gap provided by Aluminium brackets and rail
- 3mm Profiled steel carrier sheeting
- 1.5mm Standing Seam Zinc (7135 kg/m³/ 10.7kg/m²)

2. Existing & Proposed ACM / Timber Systems

Existing ACM / Timber Cladding– (RW 46 dB)

- 12.5mm wallboard (assumed 8kg/m² each board)
- 120mm air gap
- 50mm metal stud frame
- 50mm Styrofoam rigid insulation
- 2mm PPC Aluminium
- 24mm Marine Plywood (assumed 13.4kg/m²)
- 2mm PPC Aluminium
- 66mm Timber Battens (air gap)
- 18mm horizontal timber boards (assumed 12kg/m²)

Proposed ACM / Timber Cladding– (Rw 54dB)

- 12.5mm wallboard (assumed 8kg/m² each board)
- 120mm air gap filled with mineral wool (assumed 10kg/m³)
- 50mm metal stud frame
- 2mm PPC Aluminium
- Compressed Mineral Wool
- 2mm PPC Aluminium
- 65mm Envelope Aluminium brackets and rails, filled with mineral wool (Ignored from acoustic point of view, including air gap)
- 22mm timber cement boards (assumed 1275kg/m³)

I trust this is of assistance. Please do not hesitate to contact me if you require anything further.

Yours sincerely,

Pedro Rodrigues,
MIOA, MSc Civil Engineer (CEng)
Senior Acoustic Consultant
FOR ACOUSTIC CONSULTANTS LIMITED



Appendix – Sound Insulation Index Calcs - INSUL

Existing Zinc System

Sound Insulation Prediction (v9.0.20)

Program copyright Marshall Day Acoustics 2017

Margin of error is generally within $R_w \pm 3$ dB

- Key No. 6548

Job Name:

Job No.:

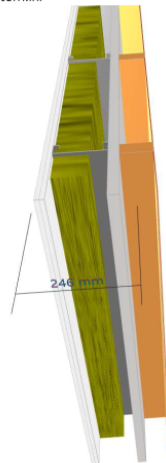
Date: 15/12/2022

File Name: Existing Zinc System.ixl

Initials: pedro



Notes:



R_w 60 dB

C -4 dB

Ctr -11 dB

Mass-air-mass resonant frequency = 53 Hz, 84 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 58.3 kg/m²

System description

Panel 1 : 2 x 12.5 mm Gyproc Wallboard 12.5mm

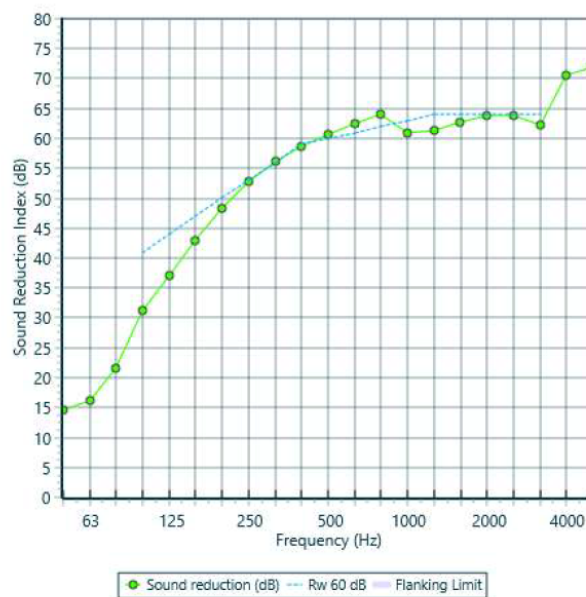
Frame: Steel Stud (0.55mm) (1.5E2 mm x 40 mm), Stud spacing 600 mm; Cavity Width 100 mm, 1 x Fibreglass (10kg/m³) Thickness 100 mm

Panel 2 : 1 x 30 mm Siniat GTEC Standard 9.5mm

Frame: Timber stud (90 mm x 45 mm), Stud spacing 600 mm; Cavity Width 90 mm

Panel 3 : 1 x 1.5 mm Copper

freq.(Hz)	R(dB)	R(dB)
50	15	
63	16	17
80	22	
100	31	
125	37	35
160	43	
200	48	
250	53	51
315	56	
400	59	
500	61	60
630	62	
800	64	
1000	61	62
1250	61	
1600	63	
2000	64	63
2500	64	
3150	62	
4000	71	66
5000	72	





Proposed Zinc System

Sound Insulation Prediction (v9.0.11)

Program copyright Marshall Day Acoustics 2017

margin of error is generally within $R_w \pm 3$ dB

- Key No. 6548

Job Name:

Job No.:

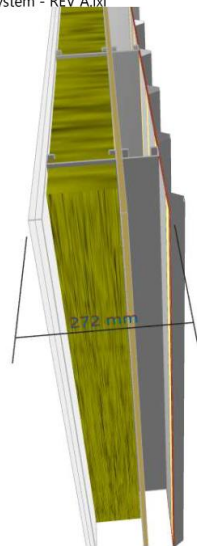
Date: 16/12/2022

File Name: Proposed Zinc System - REV A1.xl

Initials: Pedro Rodrigues



Notes:



R_w 66 dB

C -3 dB

Ctr -9 dB

Mass-air-mass resonant frequency = 39 Hz, 86 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 70.9 kg/m²

System description

Panel 1 : 2 x 12.5 mm Gyproc Wallboard 12.5mm

Frame: Steel Stud (0.55mm) (1.5E2 mm x 38 mm); Cavity Width 150 mm; Stud spacing 600 mm; 1 x Fibreglass (10kg/m3) Thickness 150 mm

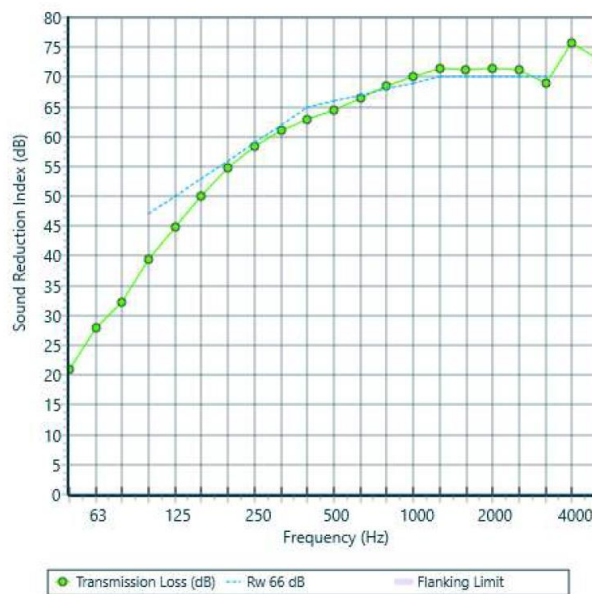
Panel 2 + 1 x 12 mm RCM CemBoard (cement particle board)

Frame: Steel Stud (0.55mm) (80 mm x 38 mm); Cavity Width 80 mm

Panel 3 + 1 x 3 mm Roof Cladding Windex

+ 1 x 1.5 mm Copper

freq.(Hz)	TL(dB)	TL(dB)
50	21	
63	28	25
80	32	
100	39	
125	45	43
160	50	
200	55	
250	58	57
315	61	
400	63	
500	64	64
630	66	
800	69	
1000	70	70
1250	71	
1600	71	
2000	71	71
2500	71	
3150	69	
4000	76	72
5000	73	





Existing ACM / Timber Cladding

Sound Insulation Prediction (v9.0.11)

Program copyright Marshall Day Acoustics 2017
margin of error is generally within $R_w \pm 3$ dB

- Key No. 6548

Job Name:

Job No.:

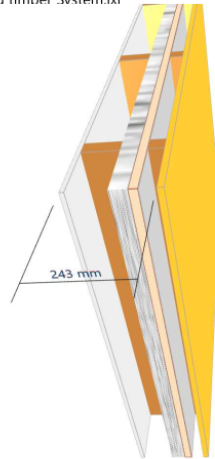
Date: 16/12/2022

File Name: Existing timber System.idx

Initials: Pedro Rodrigues



Notes:



R_w 46 dB

C -5 dB

Ctr -12 dB

Mass-air-mass resonant frequency = 75 Hz, 107 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 43.3 kg/m²

System description

Panel 1 : 1 x 12.5 mm Gyproc Wallboard 12.5mm

Frame: Polystyrene Insulation on Stud (1.1E2 mm x 45 mm); Cavity Width 120 mm

Panel 2 + 1 x 1.5 mm Aluminium

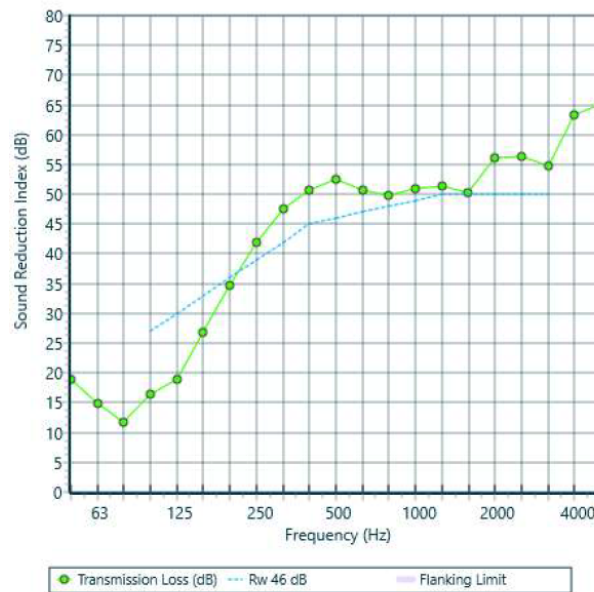
+ 1 x 1.5 mm Aluminium

+ 1 x 24 mm Plywood

Frame: Timber stud (46 mm x 45 mm); Cavity Width 66 mm

Panel 3 + 1 x 18 mm Particle Board

freq.(Hz)	TL(dB)	TL(dB)
50	19	
63	15	14
80	12	
100	16	
125	19	19
160	27	
200	35	
250	42	39
315	47	
400	51	
500	53	51
630	51	
800	50	
1000	51	51
1250	51	
1600	50	
2000	56	53
2500	56	
3150	55	
4000	63	59
5000	65	





Proposed ACM / Timber Cladding

Sound Insulation Prediction (v9.0.11)

Program copyright Marshall Day Acoustics 2017

margin of error is generally within $R_w \pm 3$ dB

- Key No. 6548

Job Name:

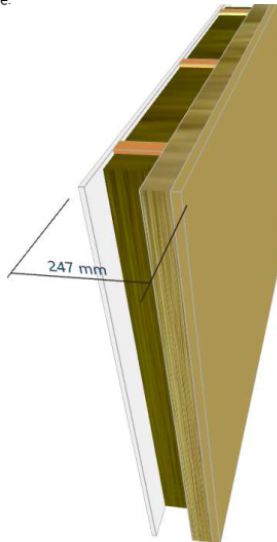
Job No.:

Date: 16/12/2022

File Name:

Initials: Pedro Rodrigues

Notes:



R_w 54 dB
C -1 dB
Ctr -6 dB

Mass-air-mass resonant frequency = 51 Hz, 136 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 51.1 kg/m²

System description

Panel 1 : 1 x 12.5 mm Gyproc Wallboard 12.5mm

Frame: Timber stud (1.2E2 mm x 45 mm); Cavity Width 120 mm , Stud spacing 600 mm , 1 x Fibreglass (10kg/m3) Thickness 120 mm

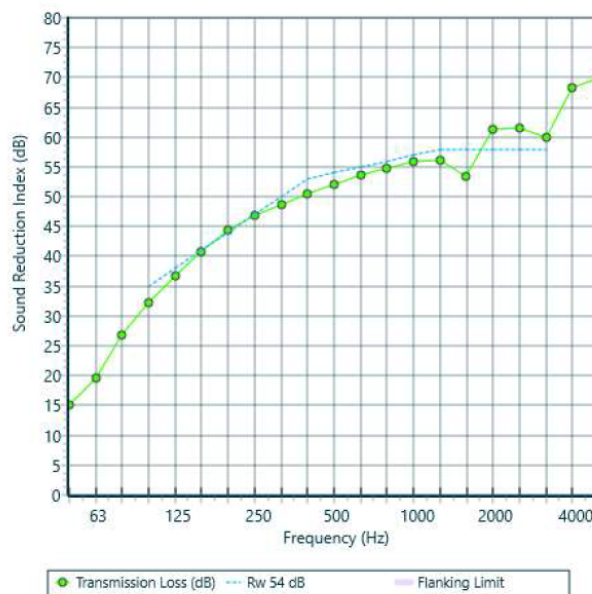
Panel 2 + 1 x 1.5 mm Aluminium

Frame: Bonded Insulation (90 mm x 45 mm); Cavity Width 90 mm (p:40 kg/m3, E:0.007 GPa, η:0.20)

Panel 3 + 1 x 1.5 mm Aluminium

+ 1 x 22 mm RCM CemBoard (cement particle board)

freq.(Hz)	TL(dB)	TL(dB)
50	15	
63	20	18
80	27	
100	32	
125	37	35
160	41	
200	44	
250	47	46
315	49	
400	50	
500	52	52
630	54	
800	55	
1000	56	56
1250	56	
1600	53	
2000	61	57
2500	61	
3150	60	
4000	68	64
5000	70	





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