

Tim Farnworth
Halliday Meecham Architects Ltd
111 Piccadilly
Manchester
M1 2HY

August 25, 2021

Our Ref: CSGA-C1993-T1

FAO: Tim Farnworth

Emailed to: tf@hallidaymeecham.com, klee@hallidaymeecham.com

Dear Tim,

Re: Sound Insulation Review of Replacement Cladding – Castlegate

CSG Acoustics Ltd have been commissioned by Halliday Meecham Architects to provide a sound insulation review of changes to cladding at Castlegate Apartments, Castlefield, Manchester.

The existing cladding is to be replaced and this letter details a review of the changes in terms of sound insulation. This is to ensure the proposed changes do not reduce the sound insulation performance of the façade.

The original acoustic façade performance requirement and the external noise levels are unknown and therefore no absolute noise break-in levels have been assessed. This assessment reviews the likely difference in acoustic performance due to the change and provides a specification for materials, where necessary.

Yours Sincerely,



Andy Ryan BSc(Hons) MIOA
Associate Consultant
andy@csgacoustics.co.uk

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1 Sound Insulation Review

The appended drawings from Halliday Meecham show the proposed changes to the façade cladding (3 Types). INSUL Sound insulation software has been used to assess each existing and proposed constructions to allow direct comparison.

Also appended to this letter is the full INSUL predictions for each of the existing and subsequent proposed constructions.

There are three types of façade cladding to be replaced and the following table details our sound insulation assessment of each type. The assessment includes a low frequency correction (C_{tr}) to account for the possibility of low frequency traffic noise.

Table 1.1: Sound Insulation Assessment

Façade Type	Cladding Details		Sound Insulation Prediction
Timber Drawing Ref: 5412-HMA-CA-ZZ- DR-A-21201	Existing	• Timber cladding boards • Fibre Cement Board • Bitumen impregnated sheathing board • Cavity 150mm • 50mm Insulation (33kg/m²) • 2 x 12.5mm Plasterboard	R_w 52 dB C_{tr} -5 dB $R_w + C_{tr} = 47\text{dB}$
	Proposed	• 9mm Rockpanels / Cladding • 50 Rainscreen DUO (100kg/m²) • 12.5mm Sheathing Board / Weather Defence board (11 kg/m²) • Cavity 150mm • 150mm Insulation (33kg/m²) • 2 x 12.5mm Plasterboard	R_w 58 dB C_{tr} -7 dB $R_w + C_{tr} = 51\text{ dB}$
Redstone Cladding Drawing Ref: 5412-HMA-CA-ZZ- DR-A-21203	Existing	• Red Stone Cladding • 120mm Cavity with 50mm PIR insulation (20kg/m²) • 100mm Blockwork • 2 x 12.5mm Plasterboard	R_w 57 dB C_{tr} -4 dB $R_w + C_{tr} = 53\text{ dB}$
	Proposed	• Red Stone Cladding • 130mm Cavity with 75mm insulation (33kg/m²) • 100mm Blockwork • 2 x 12.5mm Plasterboard	R_w 57 dB C_{tr} -4 dB $R_w + C_{tr} = 53\text{ dB}$

ACM Cladding Drawing Ref: 5412-HMA-CA-ZZ- DR-A-21205	Existing	• ACM Cladding • ~300mm Cavity with 50mm Insulation (33kg/m²) • 2 x 12.5mm Plasterboard	R _w 55 dB C _{tr} -6 dB R_w + C_{tr} = 49 dB
	Proposed	• Aluminium Cladding System • 50mm Rainscreen DUO slab (100kg/m²) • 12.5mm Weather / Sheathing board (11 kg/m²) • 150mm Cavity with 150mm insulation (33kg/m²) • 2 x 12.5mm Plasterboard	R _w 57 dB C _{tr} -8 dB R_w + C_{tr} = 49 dB

2 Results Discussion

As seen in the table above, all the proposed constructions are predicted to either equal or improve the existing sound insulation performance of the overall façade construction.

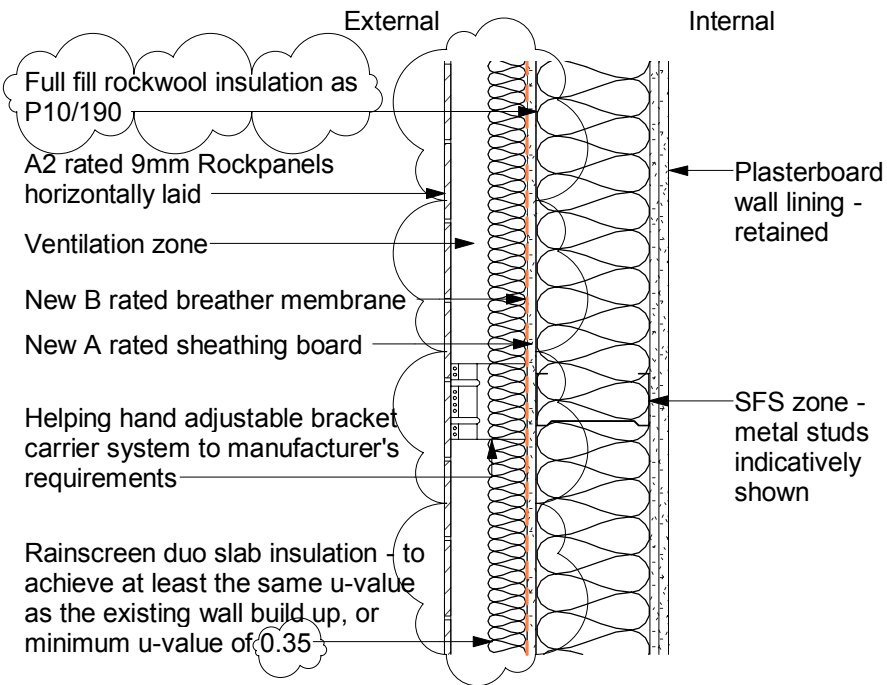
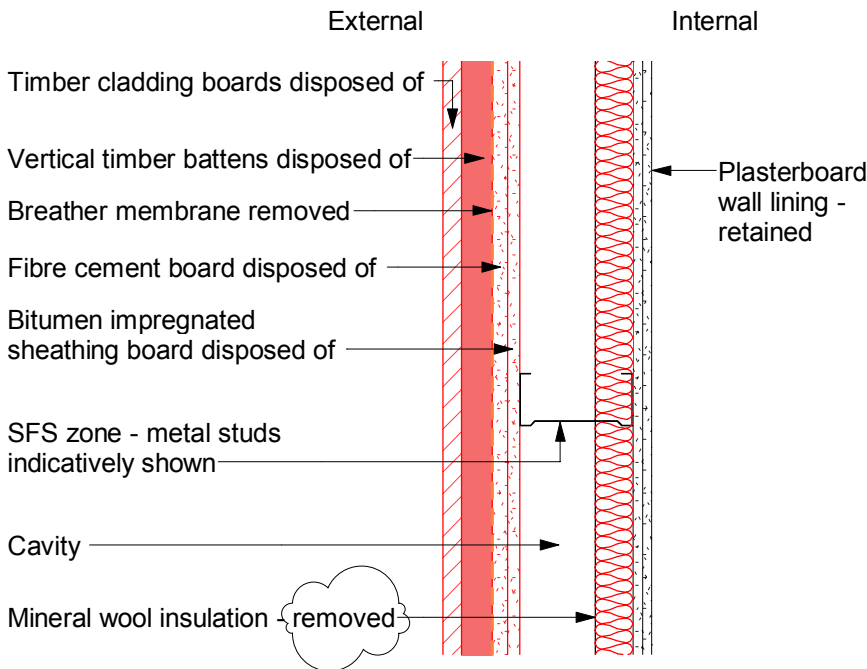
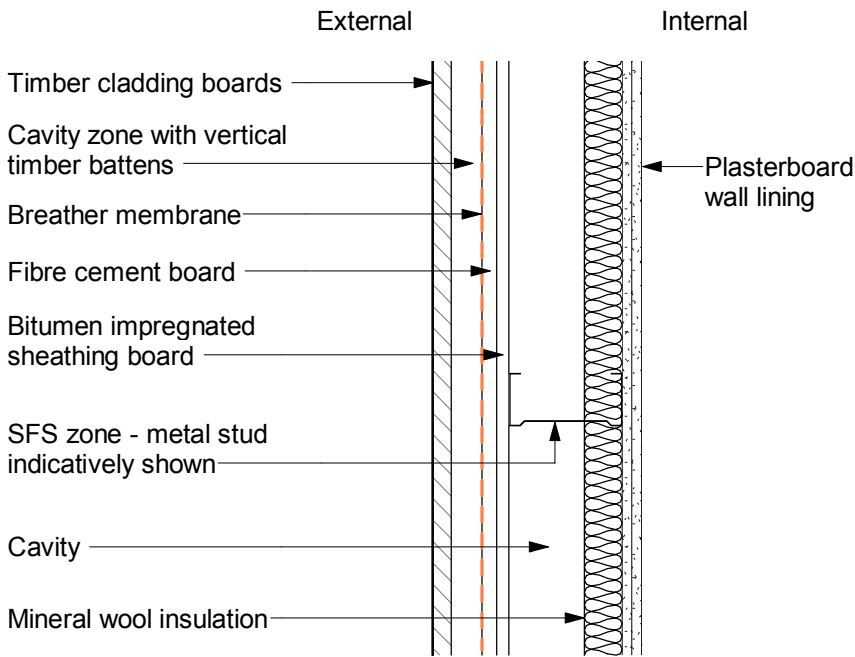
Therefore based on the above detailed sound insulation predictions of the proposed constructions, the changes to the façade should not have any detrimental effect on the noise break-in.

This is provided all boards and framing is installed as per manufacturers instruction, the materials meet the density figures shown in the above table and penetrations are also suitably sealed (around windows for example).

Please note:

The contents of this drawing are based on (survey/ existing) information supplied by a third party. Halliday Meecham Architects can accept no responsibility for the accuracy of this information and/or works based upon it. The contractor must check the accuracy of these drawings on site and notify Halliday Meecham Architects of any discrepancies.

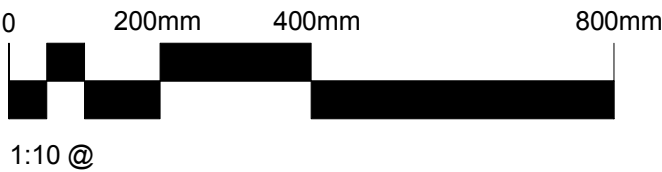
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1 Existing wall build up - timber
1 : 10 @ A3

2 Wall build up - timber strip out
1 : 10 @ A3

3 Wall build up - timber proposed
1 : 10 @ A3

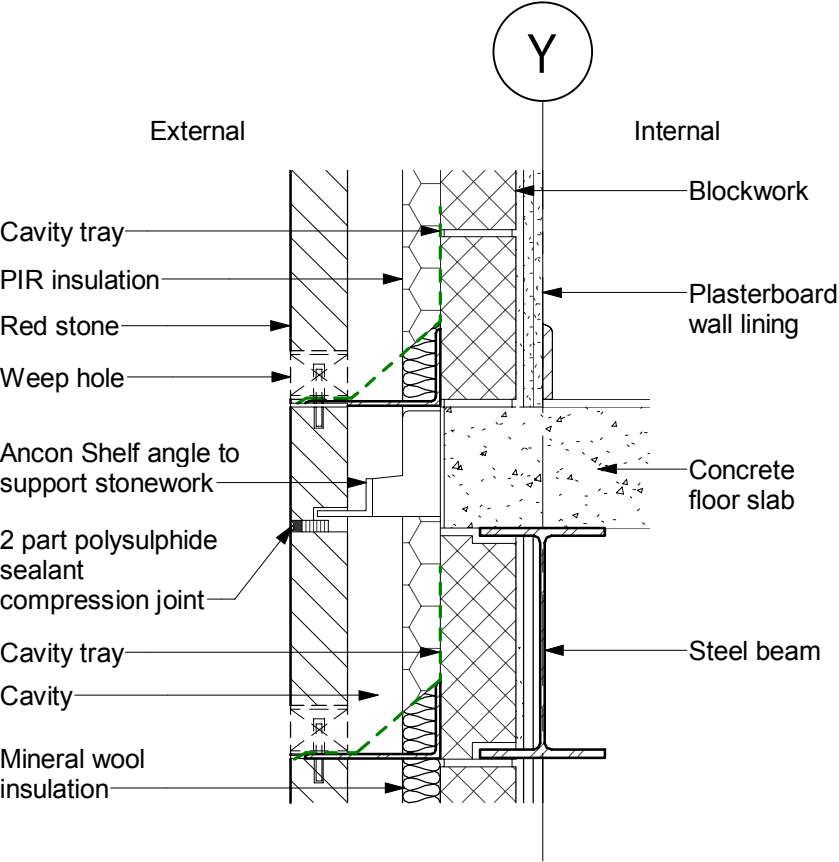


P02	Additional insulation added, proposed wall thickness increased, notes added/ updated	16.08.21	KL	TF
P01	First issue	30.06.21	KL	TF
Revision	Description	Date	Drawn	Checked
Halliday Meecham Architects Limited				
111 Piccadilly Manchester M1 2HY +44 (0)161 661 5566				
4 Devonshire Street London W1W 5DT +44 (0)203 440 5175				
hma@hallidaymeecham.com www.hallidaymeecham.com				
Client: Warden Construction Ltd				
Project: Castlegate Apartments				
Phase/ Location: Chester Road, Manchester				
Drawing: External Wall Build Up - Timber				
Scale @ A3	Date: 06/28/21	Drawn: KL	Checked: TF	Job No. 5412
				Drawing No. 21201
Drawing Ref.	5412-HMA-CA-ZZ-DR-A-21201			Revision P02

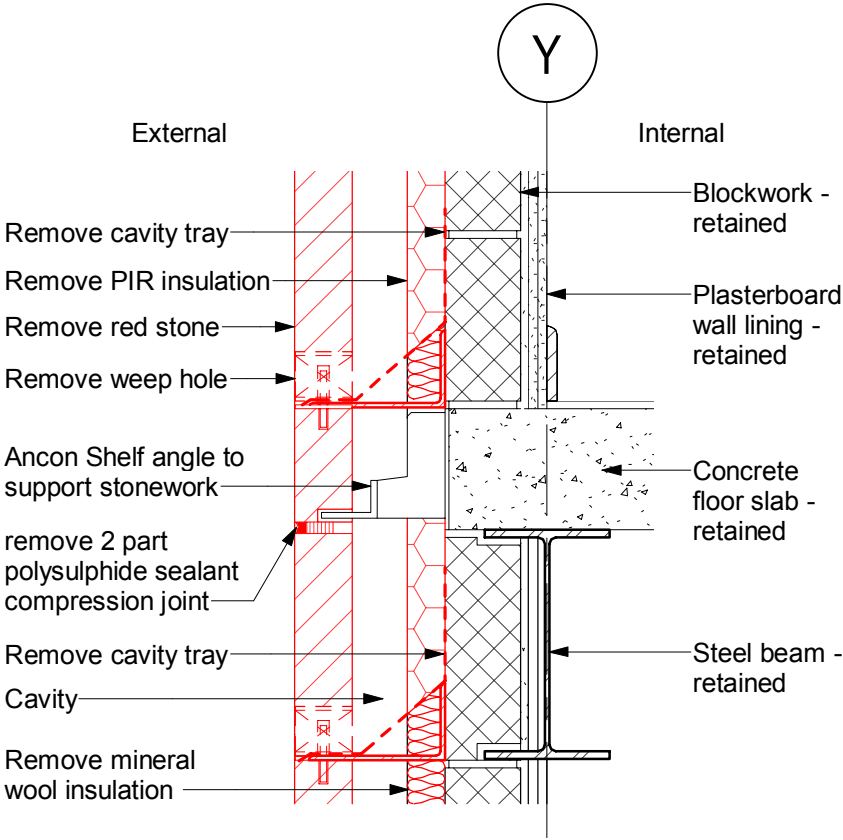
Please note:

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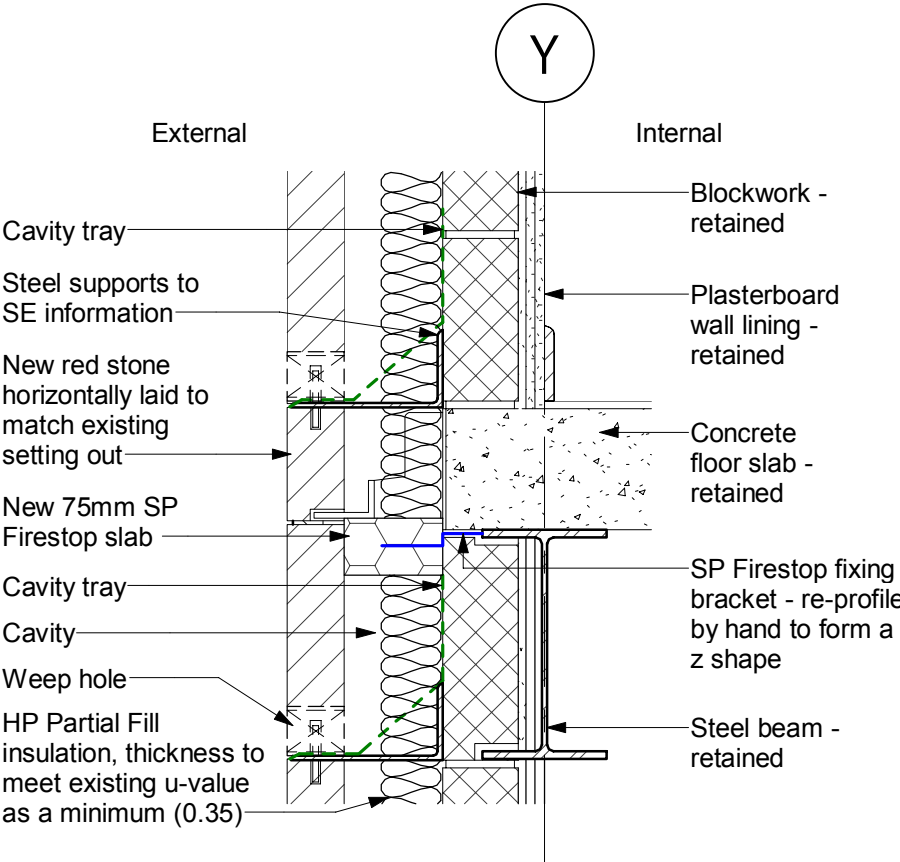
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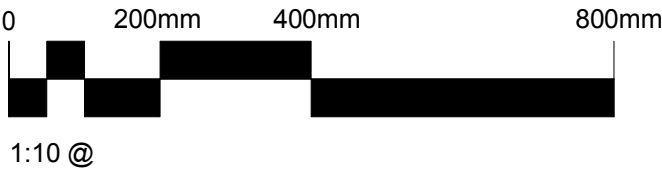
1 Existing wall build up - red stone
1 : 10 @ A3



2 Wall build up - red stone strip out
1 : 10 @ A3



3 Wall build up - red stone proposed
1 : 10 @ A3

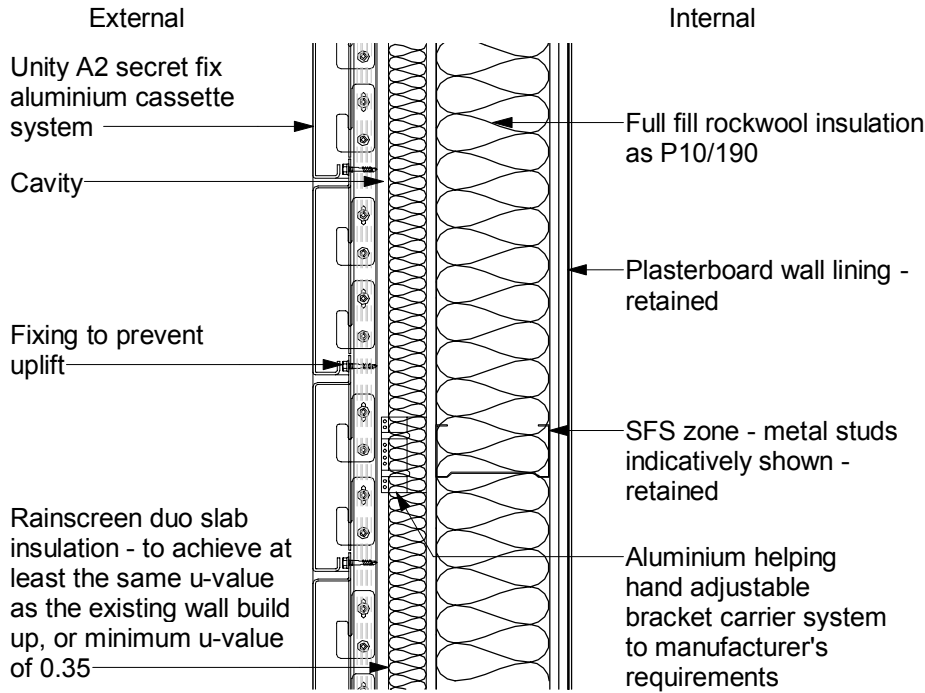
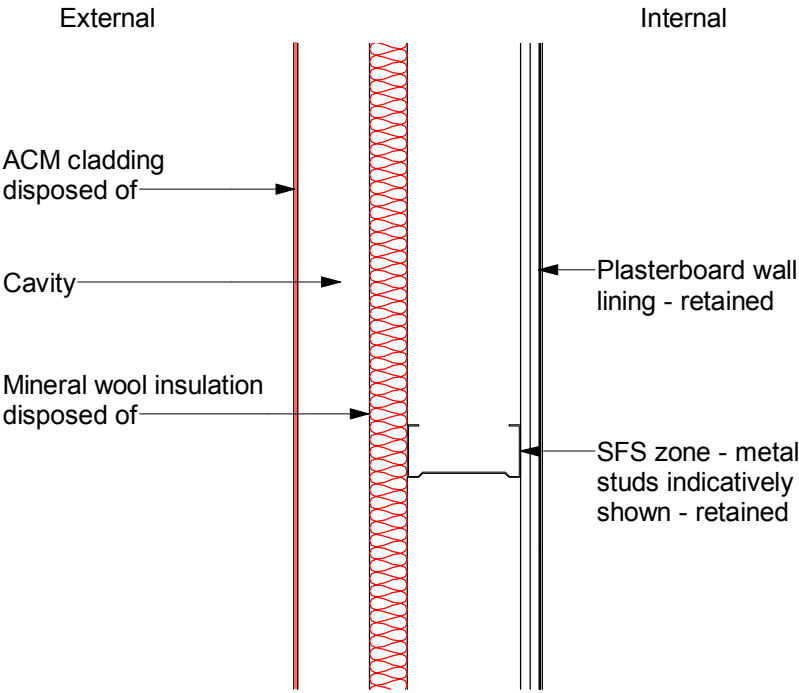
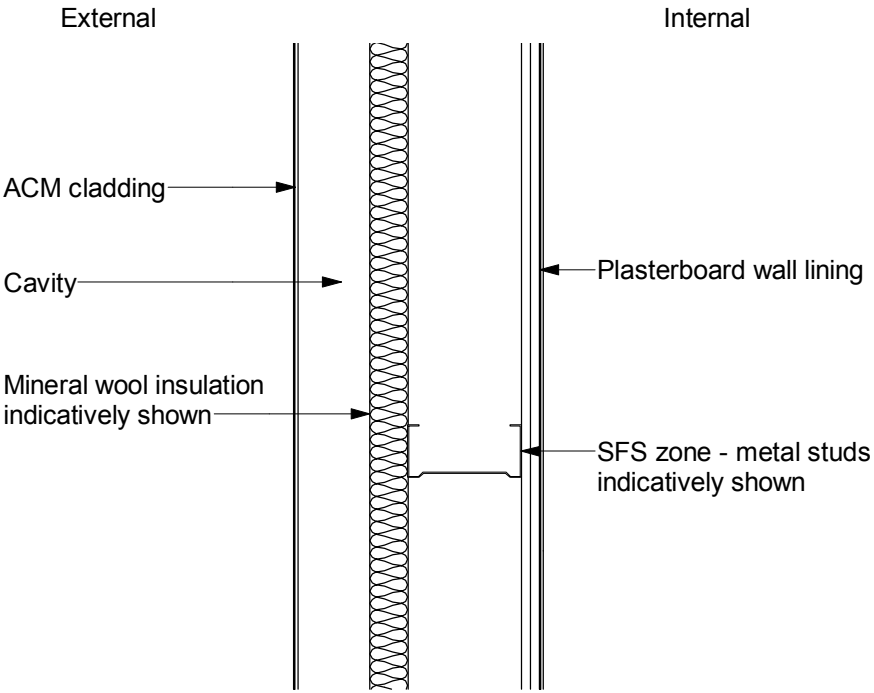


P01	First issue	16.08.2021	KL	TF
Revision	Description	Date	Drawn	Checked
Halliday Meecham Architects Limited				
111 Piccadilly Manchester M1 2HY +44 (0)161 661 5566				
4 Devonshire Street London W1W 5DT +44 (0)203 440 5175				
hma@hallidaymeecham.com www.hallidaymeecham.com				
Client: Warden Construction Ltd				
Project: Castlegate Apartments				
Phase/Location: Chester Road, Manchester				
Drawing: External Wall Build Up - Red Stone				
Scale @ A3	Date:	Drawn:	Checked:	Job No.
1:10	06/07/21	KL	TF	5412
Drawing Ref.	5412-HMA-CA-ZZ-DR-A-21203			Revision
				P01

Please note:

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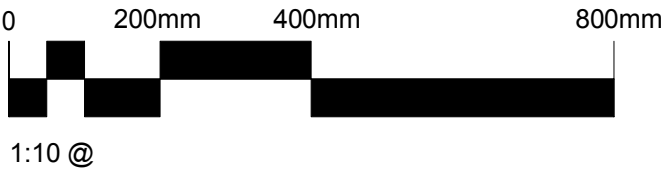
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1 Existing wall build up - ACM
1 : 10 @ A3

2 Wall build up - ACM strip out
1 : 10 @ A1

3 Wall build up - proposed
1 : 10 @ A1



DRAFT

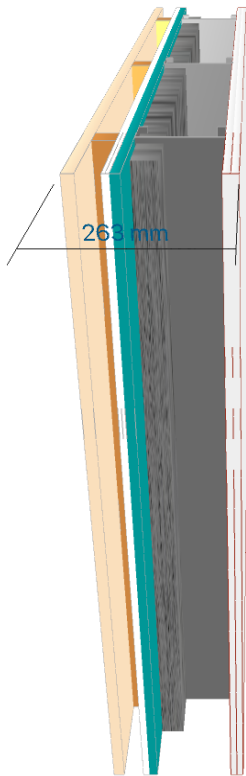
P01	First issue	19.08.21	KL	
Revision	Description	Date	Drawn	Checked
Halliday Meecham Architects Limited				
111 Piccadilly Manchester M1 2HY +44 (0)161 661 5566				
4 Devonshire Street London W1W 5DT +44 (0)203 440 5175				
hma@hallidaymeecham.com www.hallidaymeecham.com				
				
Client: Warden Construction Ltd				
Project: Castlegate Apartments				
Phase/ Location: Chester Road, Manchester				
Drawing: External Wall Build Up - ACM cladding				
Scale @ A3	Date: 19/08/21	Drawn: KL	Checked: TF	Job No. 5412
				Drawing No. 21205
Drawing Ref. 5412-HMA-CA-ZZ-DR-A-21205				Revision P01

Sound Insulation Prediction (v9.0.23)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
- Key No. 6533
Job Name:
Job No.:
Date:24/08/2021
File Name:Timber existing.ixl

Initials:

Notes:



Rw 52 dB

C-2 dB

Ctr-5 dB

Mass-air-mass resonant frequency = 47 Hz , 132 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 52.6 kg/m²

System description

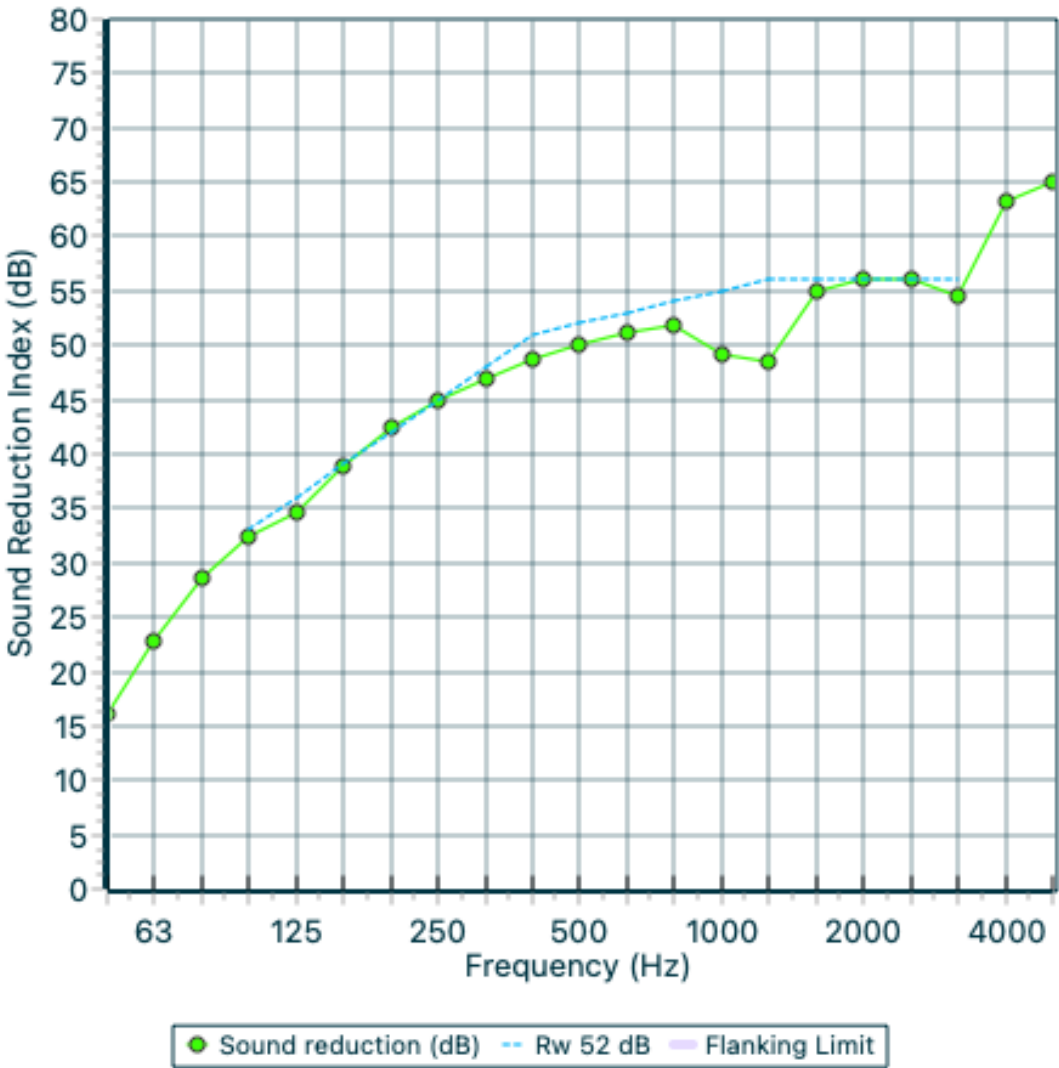
Panel 1 : 1 x 20 mm Plywood

Frame: Timber stud (40 mm x 45 mm), Stud spacing 600 mm ; Cavity Width 40 mm
Panel 2 : 2 x 6 mm Eterboard (fibre cement)

+ 1 x 16 mm Bitumen Impregnated Sheathing Fibre Board

Frame: Steel Stud (0.75mm) (1.5E2 mm x 65 mm), Stud spacing 600 mm ; Cavity Width 150 mm , 1 x Rockwool (33kg/m3) Thickness 50 mm
Panel 3 : 2 x 12.5 mm Gyproc Wallboard 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	16	
63	23	20
80	29	
100	32	
125	35	35
160	39	
200	42	
250	45	44
315	47	
400	49	
500	50	50
630	51	
800	52	
1000	49	50
1250	48	
1600	55	
2000	56	56
2500	56	
3150	55	
4000	63	58
5000	65	

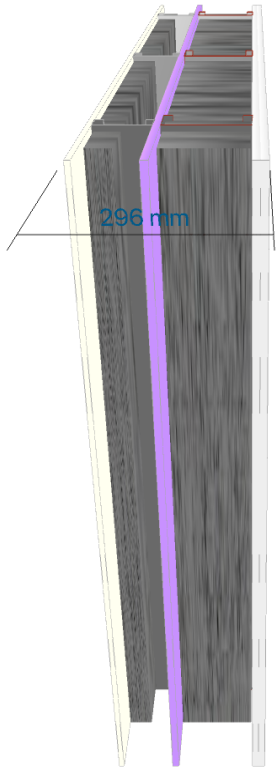


Sound Insulation Prediction (v9.0.23)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
- Key No. 6533
Job Name:
Job No.:
Date:25/08/2021
File Name:Timber_Proposed.ixl

Initials:

Notes:



Rw 58 dB

C-2 dB

Ctr-7 dB

Mass-air-mass resonant frequency = 46 Hz , 91 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 47.5 kg/m²

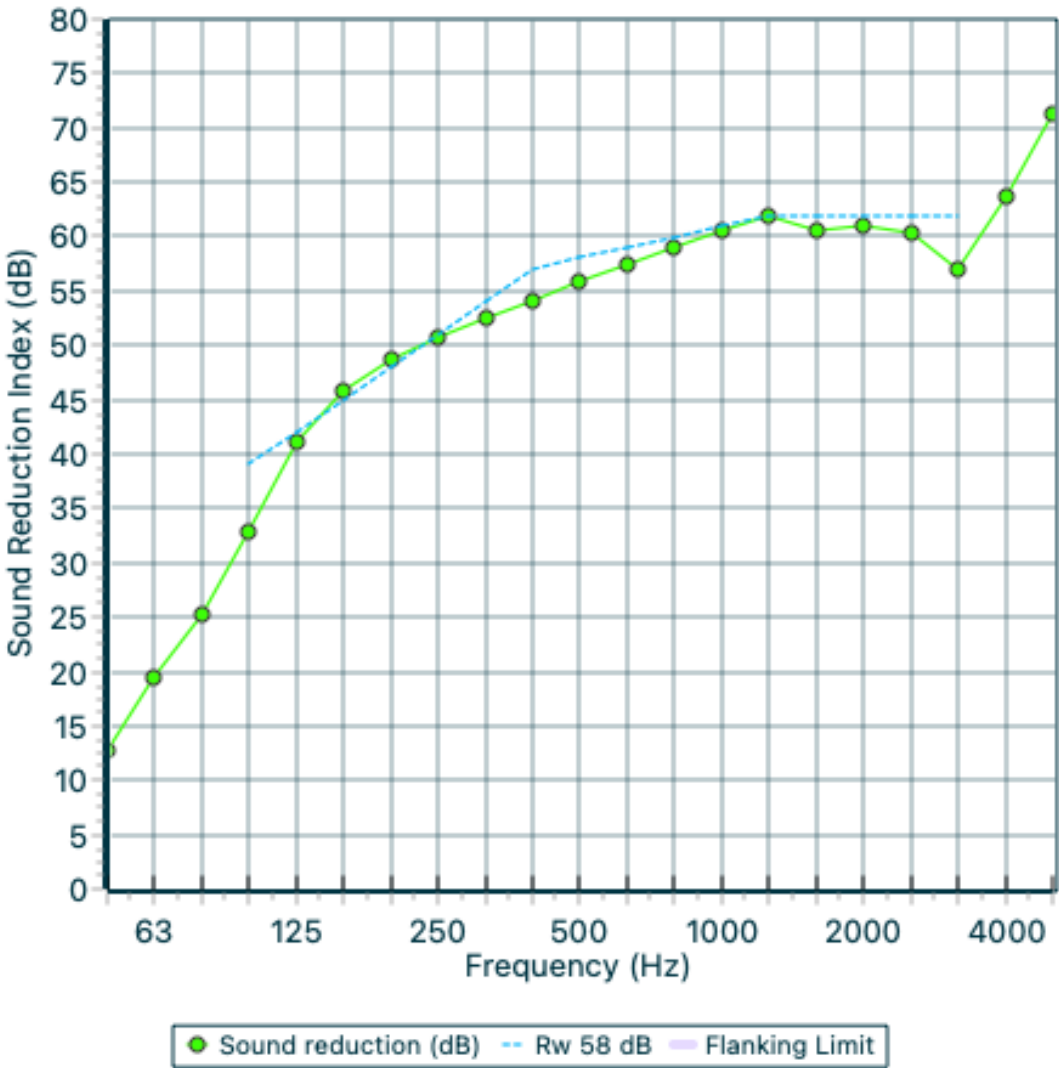
System description

Panel 1 : 1 x 9 mm NuClad

Frame: Steel Stud (0.75mm) (1E2 mm x 36 mm), Stud spacing 600 mm ; Cavity Width 100 mm , 1 x Rockwool (100kg/m3) Thickness 50 mm
Panel 2 : 1 x 12.5 mm Siniat Weather Defence 12.5mm

Frame: Steel Stud (0.75mm) (1.5E2 mm x 65 mm), Stud spacing 600 mm ; Cavity Width 150 mm , 1 x Rockwool (33kg/m3) Thickness 150 mm
Panel 3 : 2 x 12.5 mm Gyproc Wallboard 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	13	
63	19	16
80	25	
100	33	
125	41	37
160	46	
200	49	
250	51	50
315	52	
400	54	
500	56	56
630	57	
800	59	
1000	61	60
1250	62	
1600	60	
2000	61	61
2500	60	
3150	57	
4000	64	61
5000	71	

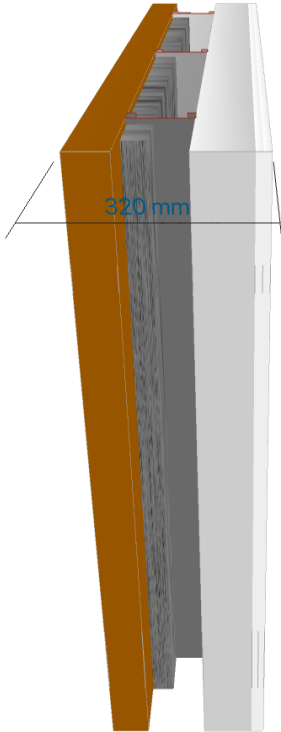


Sound Insulation Prediction (v9.0.23)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
- Key No. 6533
Job Name:
Job No.:
Date:25/08/2021
File Name:RedStone_existing.ixl

Initials:

Notes:



Rw 57 dB

C-1 dB

Ctr-4 dB

Mass-air-mass resonant frequency = 19 Hz

Panel Size = 2.7 m x 4.0 m

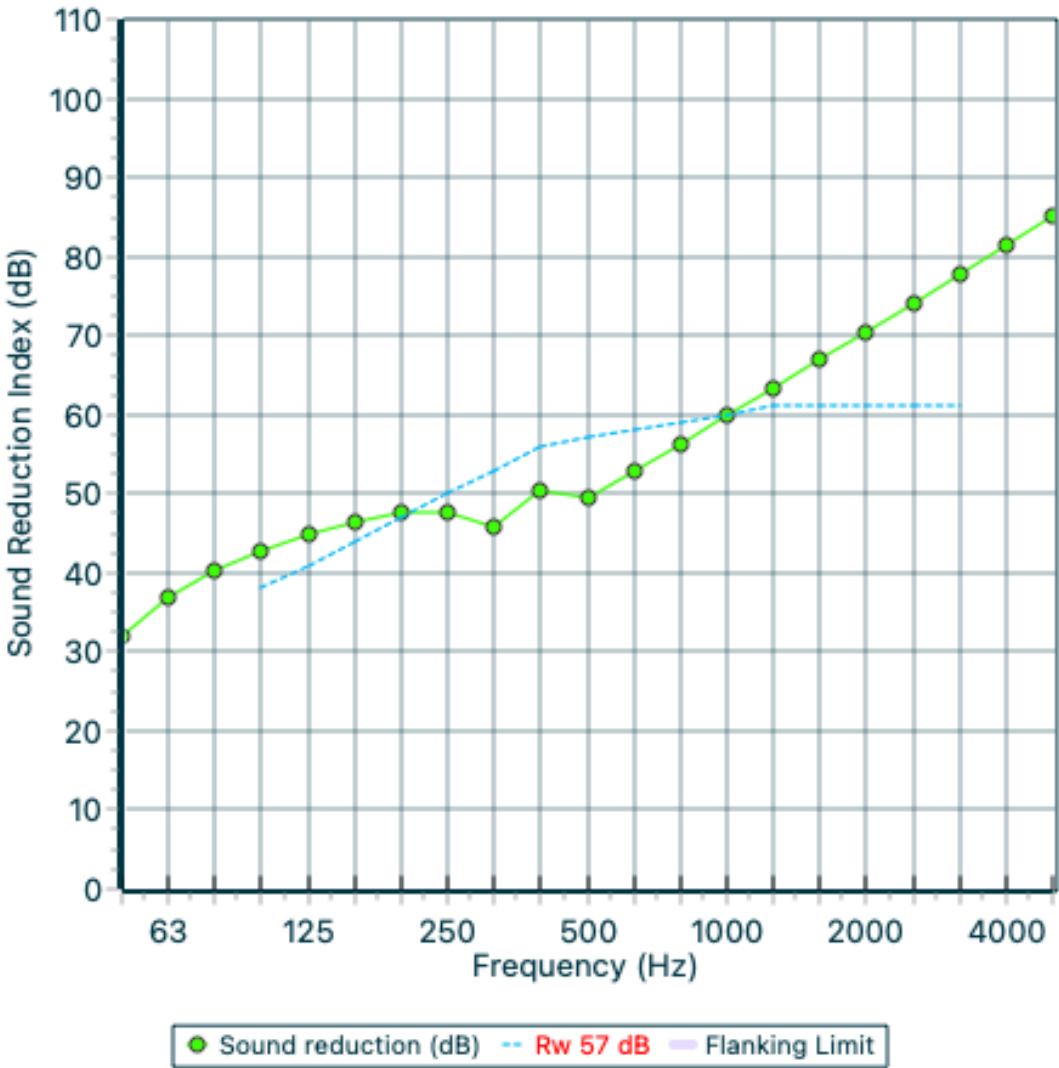
Partition surface mass = 296 kg/m²

System description

Panel 1 : 1 x 75 mm Redstone Cladding

Frame: Steel Stud (1.0-1.6mm) (1.2E2 mm x 36 mm), Stud spacing 600 mm ; Cavity Width 120 mm , 1 x Rockwool (48kg/m3) Thickness 50 mm
Panel 2 : 1 x 100 mm Concrete Block + 2 x 12.5 mm Gyproc Wallboard 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	32	
63	37	35
80	40	
100	43	
125	45	44
160	46	
200	48	
250	48	47
315	46	
400	50	
500	49	51
630	53	
800	56	
1000	60	59
1250	63	
1600	67	
2000	70	70
2500	74	
3150	78	
4000	81	80
5000	85	

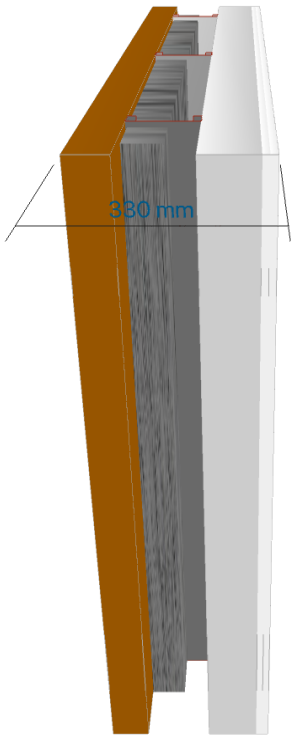


Sound Insulation Prediction (v9.0.23)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
- Key No. 6533
Job Name:
Job No.: Initials:
Date:25/08/2021
File Name:RedStone_proposed.ixl



Notes:



Rw 57 dB

C-1 dB

Ctr-4 dB

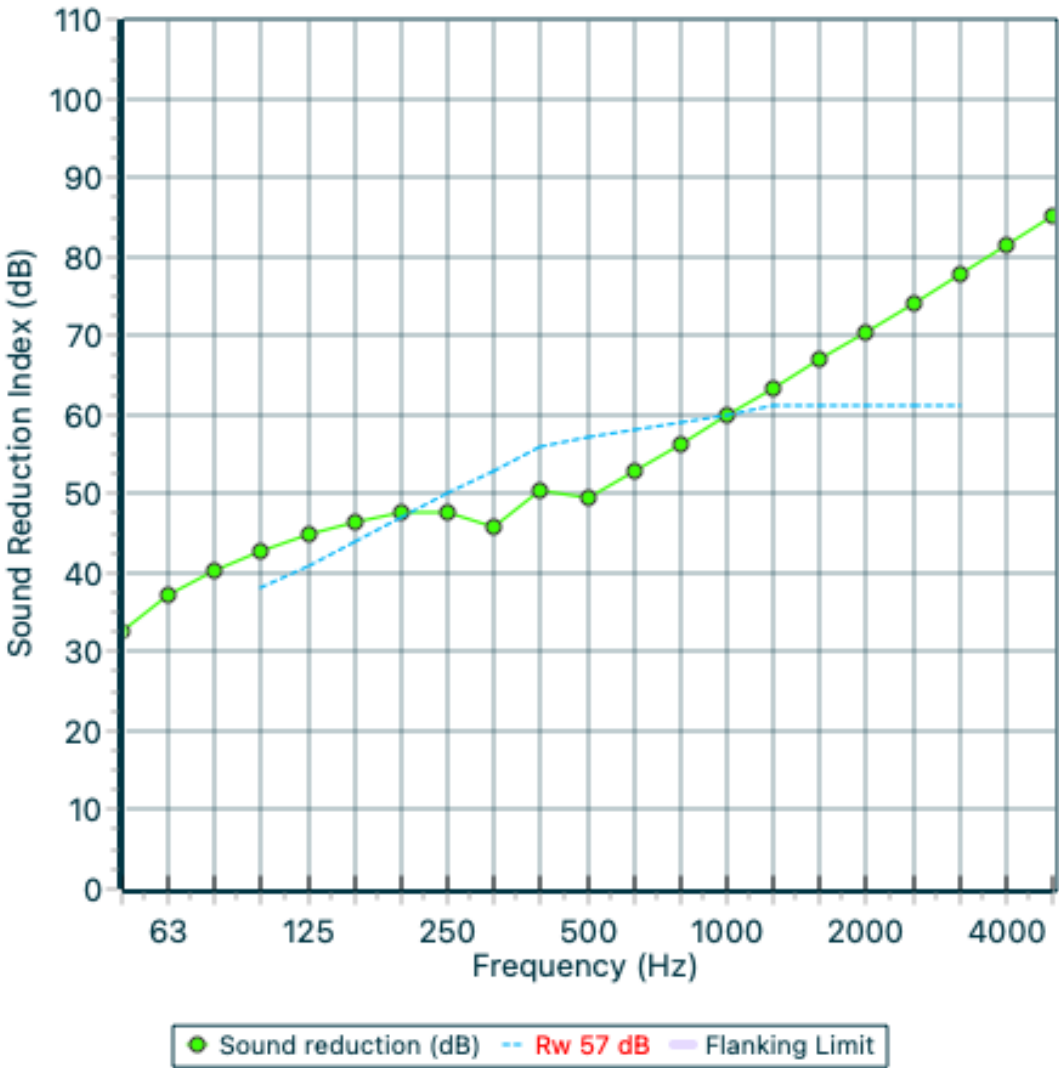
Mass-air-mass resonant frequency = 18 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 296 kg/m²

System description

Panel 1 : 1 x 75 mm Redstone Cladding

Frame: Steel Stud (1.0-1.6mm) (1.3E2 mm x 36 mm), Stud spacing 600 mm ; Cavity Width 130 mm , 1 x Rockwool (33kg/m3) Thickness 75 mm
Panel 2 : 1 x 100 mm Concrete Block + 2 x 12.5 mm Gyproc Wallboard 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	33	
63	37	36
80	40	
100	43	
125	45	44
160	46	
200	48	
250	48	47
315	46	
400	50	
500	49	51
630	53	
800	56	
1000	60	59
1250	63	
1600	67	
2000	70	70
2500	74	
3150	78	
4000	81	80
5000	85	

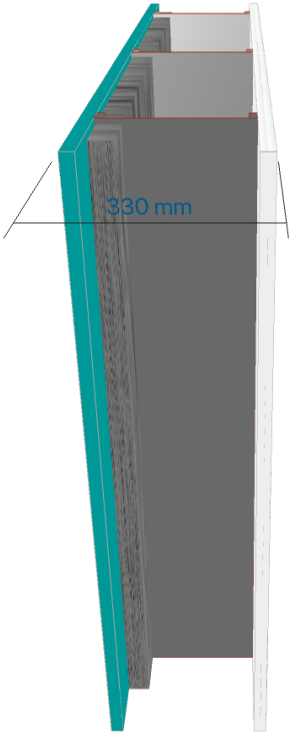


Sound Insulation Prediction (v9.0.23)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
- Key No. 6533
Job Name:
Job No.:
Date:25/08/2021
File Name:ACM _existing.ixl

Initials:

Notes:



Rw 55 dB

C-2 dB

Ctr-6 dB

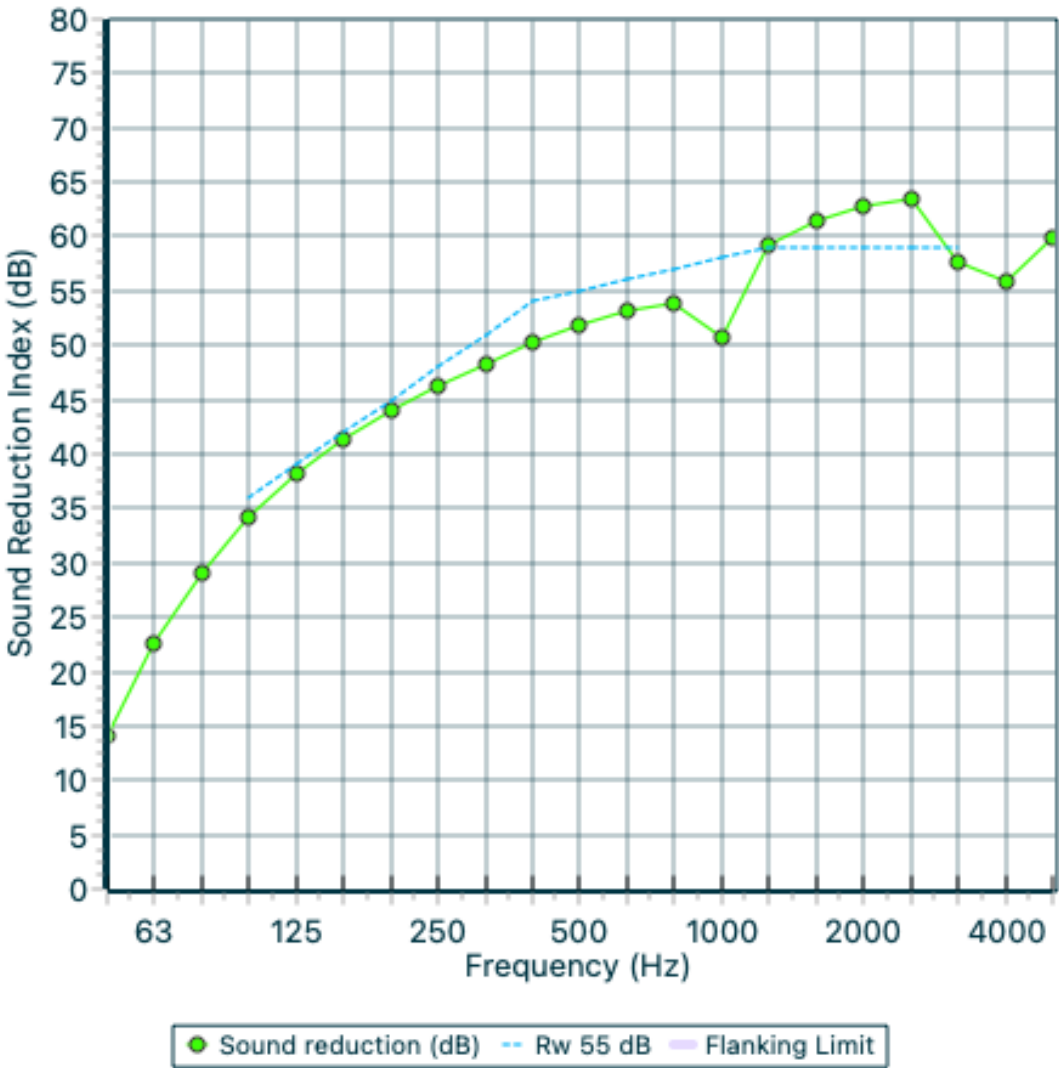
Mass-air-mass resonant frequency = 32 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 37.6 kg/m²

System description

Panel 1 : 1 x 25 mm ACM Panel

Frame: Steel Stud (0.75mm) (2.8E2 mm x 36 mm), Stud spacing 600 mm ; Cavity Width 280 mm , 1 x Rockwool (33kg/m3) Thickness 50 mm
Panel 2 : 2 x 12.5 mm Gyproc Wallboard 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	14	
63	23	18
80	29	
100	34	
125	38	37
160	41	
200	44	
250	46	46
315	48	
400	50	
500	52	52
630	53	
800	54	
1000	51	53
1250	59	
1600	61	
2000	63	62
2500	63	
3150	58	
4000	56	57
5000	60	

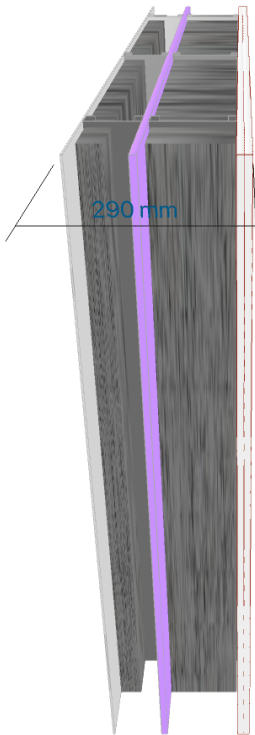


Sound Insulation Prediction (v9.0.23)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
- Key No. 6533
Job Name:
Job No.: Initials:
Date:25/08/2021
File Name:ACM_proposed replacement.ixl



Notes:



Rw 57 dB

C-2 dB

Ctr-8 dB

Mass-air-mass resonant frequency = 48 Hz , 94 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 45.5 kg/m²

System description

Panel 1 : 1 x 3 mm Aluminium

Frame: Steel Stud (0.75mm) (1E2 mm x 36 mm), Stud spacing 600 mm ; Cavity Width 100 mm , 1 x Rockwool (100kg/m3) Thickness 50 mm
Panel 2 : 1 x 12.5 mm Siniat Weather Defence 12.5mm

Frame: Steel Stud (0.75mm) (1.5E2 mm x 36 mm), Stud spacing 600 mm ; Cavity Width 150 mm , 1 x Rockwool (33kg/m3) Thickness 150 mm
Panel 3 : 2 x 12.5 mm Gyproc Wallboard 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	12	
63	18	16
80	24	
100	31	
125	40	35
160	45	
200	48	
250	50	50
315	52	
400	54	
500	55	55
630	57	
800	59	
1000	60	60
1250	61	
1600	60	
2000	60	60
2500	60	
3150	57	
4000	64	60
5000	71	

