Acoustic South East

Reinhardt Slabbert Esq. Revival Investments Ltd 5 Clifton Mews Cliffton Hill Brighton BN1 3HR	Simas Bobelis Esq. Stickland Wright 23 Vine Street Brighton BN1 4AG

Date:	22/02/2024
Site:	Premium House, Brighton Road, Worthing
Job Reference:	J3652

Dear Reinhardt / Simas,

This letter relates to Planning Condition 2 of the granted prior approval development for the above site, reference NOTICE/0007/23, which is shown as below and is considered fully compliant with the requirements:

> Works for implementing the development shall not commence until precise details of the proposed sound reduction and ventilation measures based on the mitigation strategy detailed in the submitted Environmental Noise Survey and Assessment J3652 Issue 3 necessary to protect the proposed noise sensitive development from external commercial noise and to prevent overheating have been submitted to and approved in writing by the local planning authority. The scheme shall achieve the sound reduction levels specified in the Report and shall include full details of proposed secondary glazing, internal wall treatment and an MVHR system. The noise level of any ventilation units when in use should not exceed the levels specified in BS8233:2014 and all duct work should be fitted on anti-vibration mounts. Following approval of the scheme and prior to first occupation of any dwelling unit, a test shall be undertaken and the results submitted to the local planning authority to demonstrate that the attenuation measures proposed in the scheme are effective and protect the residential unit from noise.
>
> **Reason**: *To protect future occupiers from noise disturbance in accordance with The National Planning Policy Framework and Worthing Local Plan Policy DM22 and the Planning Noise Advice Document Sussex.*

Overheating

Firstly, it is important to state that both Gov.uk and the AVOG (Acoustics Ventilation and Overheating Guide) specifically dis-apply Overheating from change-of-use properties and so overheating is not relevant to this development.

Discussions have taken place with you the client and with the M&E consultants and information has been received as to the measures proposed to mitigate noise in accordance with the requirements of the above planning condition:

Glazing

It is understood that secondary glazing as detailed within my original report: J3652 - Issue 3 – 06/06/2023 will be installed. This glazing will have a specification as follows:

- Flat A – Secondary Glazing to have a 10mm pane of glass and a cavity of 200mm
- Flats B, C and D – Secondary Glazing to have a 4mm pane of glass and a cavity of 100mm

Ventilation

MVHR is to be installed to all residential units.

Details have been provided by the M&E consultants - Corindale Consulting - of the specification of the plant to be used, the duct runs & attenuators and the resulting room-side Noise Rating levels (NR).

The drawings referred to for my assessment are as follows:

- 23141-CDC-00-XX-DR-M-1001-S4
- 23141-CDC-00-XX-CA-M-1001
- FanDataSheets-MRXBOXAB-ECO4-20240213103325

The information states that the room-side Noise Rating will be NR22 for each flat. This comfortably satisfies the requirement from my original (issue 3) report (aforementioned) and the CIBSE guidance that the noise rating should be no higher than NR25 in bedrooms or NR30 in lounges.

NR is widely accepted as being 5dB below a dBA value: i.e. NR20 is equivalent to 25dBA.

Therefore, based on this, NR22 is equivalent to 27dBA and as such would comply comfortably with the requirements of BS8233:2014 and thus Planning Condition 2.

The M&E information is included at the end of this statement for completeness.

Construction Upgrades

The following information has been received (provided by the architects) relating to the proposed upgrades to the structure to protect each internal area from noise from adjacent spaces:

- W1 - Existing separating wall construction to be confirmed on site, walls to achieve 43dB airborne sound insulation. One side of the wall to receive independent stud wall as follows: 50mm 'C' stud to be offset 25mm away from the existing structure, to receive 25x50mm TSW battens (service void) and lined with 2no layers of 15mm thick SoundBloc plasterboard, joints staggered - joints to be taped, skimmed and finished as specified. In wet areas 15mm GTEC moisture board or where tiling is proposed WEDI board to be used.

- W2 - Walls between flats and common parts to afford 60 min. fire resistance and be as follows: 100x50mm TSW studs to receive 19mm acoustic resilient bars with 2no layers of 15mm thick Soundblock plasterboard (joints staggered) on both sides, both faces joints to be taped and to receive a plaster skim finish. Finished as specified. 50mm Isover Acoustic Partition Roll (APR 1200) or similar to meet Approved Document Part E standards (min RW 50dB) to be installed between studs.

- W3 - New internal partition walls to be constructed as follows: both faces to be lined with 12.5mm thick wallboard plasterboard (in wet areas GTEC moisture board and where tiling is proposed WEDI board to be used) fixed to 100x50mm TSW studs, 50mm thick Isover acoustic partition roll insulation (APR 1200) or similar approved to be installed between studs - joints taped, skimmed and painted.

- C1- Ceiling to achieve 60min fire resistance and be as follows: existing ceiling/floor concrete slab to receive new CasoLine MF suspended ceiling system and be as follows: Gypframe MF6 Perimeter channels fixed to perimeter walls Gypframe FEA1 Steel Angles fixed to underside of ceiling slab, Gypframe MF7 Primary Support channels fixed to hangers (angles), Gypframe MF5 Ceiling Sections fixed to underside of Gypframe MF7 Primary Support Channels, underside finished with 12.5mm Gyproc FireLine - joints taped, skimmed and painted.

- F1 - Existing floor to be acoustically upgraded, to achieve 64 dB impact and be as follows: existing finishes to be carefully removed and to receive acoustic raised flooring system C40 (by InstaCoustic) membrane to be laid on concrete floor followed with 20mm base cradle and 25mm TSW batten, finished with 10mm thick T+G floor board. 60mm thick acoustic insulation quilt to be laid between battens, acoustic sealant to be installed at all junctions between floor and wall structure, membrane to be dressed up the wall up to skirting level.

The above separating constructions have been modelled in the “Insul” software and have been predicted to provide sound insulation values as follows (prediction files included at the end of this document):

- W1 (assuming existing wall is 70mm brick): Rw 72dB with a Ctr of -9dB, thus Rw + Ctr = 63dB. When in-situ this performance is likely to reduce by 6dB due to flanking conditions etc, thus a performance of DnT,w + Ctr = 57dB. This satisfies the requirements of Approved Document E.

- W2: Rw 59dB with a Ctr of -7, thus Rw + Ctr = 52dB. When in-situ, this performance is likely to reduce by 6dB due to flanking condutions etc, thus a performance of DnT,w + Ctr = 46dB. This satisfies the requirements of Approved Document E.

- W3: Rw 40dB. This is the requirement of Approved Document E for internal walls and this wall satisfies the requirement.

- F1 + C1 combined (assuming a Solid/Reinforced concrete floor): Rw 76dB with a Ctr of -5, thus Rw + Ctr = 71dB. Once in-situ, it is likely to reduce by 6dB due to flanking conditions etc, thus a performance of DnT,w + Ctr = 65dB. This also comfortably achieves the requirements of Approved Document E.

It should be noted that all manufacturer’s instructions will be followed regarding installation.

Conclusion

Based on the information in the different elements of this statement all elements will satisfy the relevant criteria set out in Planning Condition 2.

Appendix A – M&E Information

Please note that the 9-page Report is not included here as it simply collates the information of the individual items shared below and adds information not needed here.

nuaire **SUMMARY FAN DATA SHEET**

Nuaire, Western Industrial Estate, Caerphilly, CF83 1NA, United Kingdom. email:info@nuaire.co.uk
UK Commercial enquiries T:029 2085 8200 UK Residential enquiries T:029 2085 8500 International enquiries T:+44.29 2085 8497
Whilst the information given on this data sheet is fan specific, it is in summary and reference to the product selection catalogue and installation & maintenance documents is recommended.
This data sheet produced on 13 Feb 2024 10:34 using software version 5.8.4569.0

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox

Fan Code:	**MRXBOXAB-ECO4**
Installation Manual Links:	671797
Required duty:	0.042 m³/s at 100 Pa
Addition for ancillaries:	+0 Pa
Actual duty:	0.094 m³/s at 502 Pa
Actual at required flow:	0.042 m³/s at 839 Pa
When speed controlled to required duty (44.73%):	
Motor Input Power:	**0.031 kW**
Specific Fan Power:	**0.7 W/(l/s)**
Velocity at required duty:	1.337 m/s
At full speed:	
Motor Input Power:	0.349 kW
Specific Fan Power:	3.7 W/(l/s)
Maximum Fan Speed:	3,230 RPM
Electrical Supply:	230V, 1 Phase, 50 Hz
Motor current (flc):	2.4 A
Max. operating temp:	40°C
Weight:	44 kg

Starting currents are nominal.

Sound Data

Acoustic perfomance to ISO 13347 and AMCA 300.

Noise calculated speed controlled to required duty (44.73%)

Sound Power Levels re 1 pWatts (Hz):

Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	48	54	51	41	34	27	<16	<16	27
Open Inlet (Intake & Extract)	44	47	42	41	35	30	16	<16	
Open Outlet (Supply & Exhaust)	50	58	55	53	47	45	34	26	

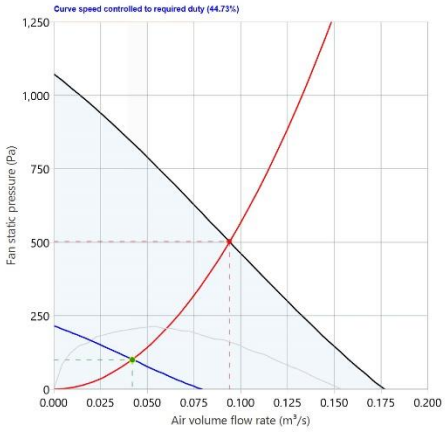
dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

MRXBOX-SIL4+FF4

Supply/Discharge	-13	-18	-22	-28	-26	-33	-34	-36
Intake/Extract	-5	-10	-15	-23	-21	-21	-17	-16

Please note that the noise data stated on this data sheet for the unit and/or silencer is tested in accordance with UK, European and International industry laboratory standards. However onsite conditions may vary and we would recommend that this information is verified by an acoustic specialist in order to ensure its suitability for the intended application.

Performance Chart



Selected Ancillaries

1 x MRXBOX-SIL4+FF4 MRXBOX Silencer + First Fix Top Box

MRXBOX-SIL4+FF4 - MRXBOX Silencer + First Fix Top Box

Resistance at required duty	0 Pa @ 0.04 m³/s
Spigot Size (mm):	220x90

Specification

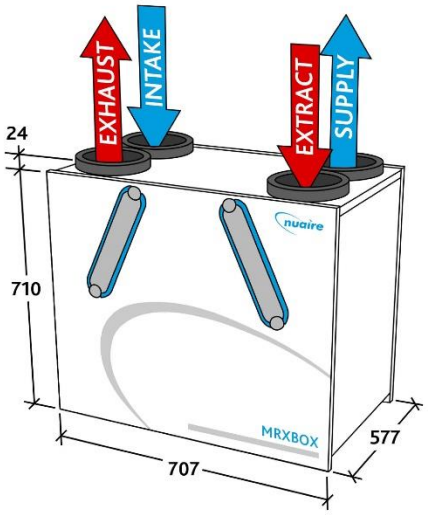
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 32mm drain connection.
The unit shall be suitable for both 200mm and 160mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.

SUMMARY FAN DATA SHEET

Nuaire, Western Industrial Estate, Caerphilly, CF83 1NA, United Kingdom. email:info@nuaire.co.uk
UK Commercial enquiries T:029 2085 8200 UK Residential enquiries T:029 2085 8500 International enquiries T:+44.29 2085 8497
Whilst the information given on this data sheet is fan specific, it is in summary and reference to the product selection catalogue and installation & maintenance documents is recommended.
This data sheet produced on 13 Feb 2024 10:34 using software version 5.8.4569.0

Fan Dimensions

SPIGOT CONFIGURATION SHOWN IS VALID FOR THE STANDARD HANDED UNIT ONLY. OPPOSITE HANDED UNIT IS ALSO AVAILABLE UPON REQUEST.



Length:	Width:	Height:
577	707	710

Spigot size: 200
Duct size: 200
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.62	94%
Kitchen + 2 wet rooms	0.62	93%
Kitchen + 3 wet rooms	0.66	93%
Kitchen + 4 wet rooms	0.79	92%
Kitchen + 5 wet rooms	0.94	91%
Kitchen + 6 wet rooms	1.15	91%
Kitchen + 7 wet rooms	1.41	91%

CORINDALE CONSULTING

Project Name	Premium House	Document Title	Calc Ref	Rev
		In duct NR Calculation MVHR	M-1001	S4-P1
Project No	23141	Supply and Exhaust		
Building			By	BH
Document Reference	23141-CDC-00-XX-CA-M-1001		Chk	BH
			Date	13/02/24

Equipment	Nuaire MRXBOX ECO4 and attenuation pod.
Connections	Supply and Extract NB These are most onerous. Extract and Inta ct are lower Figures below taken from manufacturers data sheet.
Result	NR22

	dBA							
Hz	63	125	250	500	1000	2000	4000	8000
Equipment	50	58	55	53	47	45	34	26
Silencer	13	18	22	28	26	33	34	36
Result	37	40	33	25	21	12	0	-10

http://apps.engineeringtoolbox.com/noise-rating-nr-a_20.html

http://www.engineeringtoolbox.com/nr-noise-rating-c_518.html

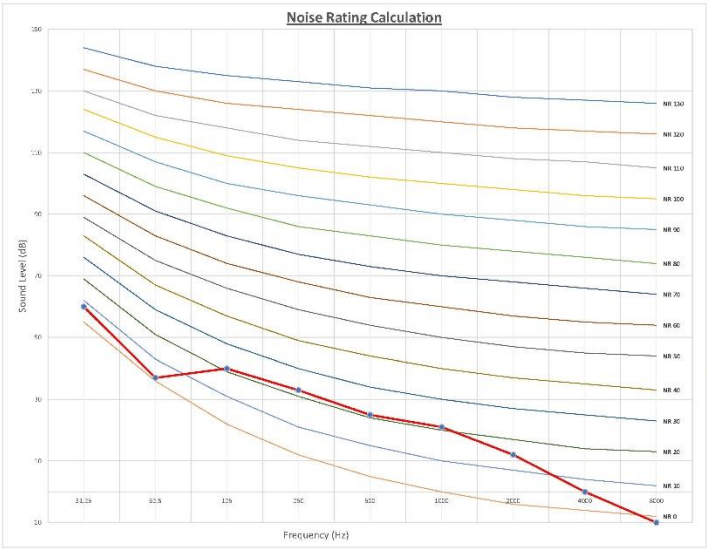
NR - Noise Rating Calculation

For more info:

http://www.engineeringtoolbox.com/nr-noise-ratings-c_60.html

If you are signed into your Google Account - select "File > Make a copy" to make your own copy to modify!!

	Octave -band Center frequency [Hz]								
	31.25	62.5	125	250	500	1000	2000	4000	8000
NR 130	144	138	133	133	131	130	128	127	126
NR 120	134	128	123	124	122	120	118	117	116
NR 110	130	122	118	114	112	110	108	107	106
NR 100	124	115	109	105	102	100	98	96	95
NR 90	117	107	100	96	93	90	88	86	85
NR 80	110	99	92	86	83	80	78	76	74
NR 70	103	91	84	77	73	70	68	66	64
NR 60	96	83	74	68	63	60	57	55	54
NR 50	89	75	65	59	54	50	47	45	44
NR 40	83	67	57	49	44	40	37	35	33
NR 30	76	59	48	40	34	30	27	25	23
NR 20	69	51	39	31	24	20	17	14	13
NR 10	62	43	31	21	15	10	7	4	2
NR 0	55	36	22	12	5	0	-4	-6	-8
Measured / Estimated values	60	37	40	33	25	21	12	0	-10



The NR plot rises slightly above the NR 20 curve. Approximately NR22



Notes:
- Do not scale this drawing.
- Before the start of any construction work, the Contractor is to check the information shown on this drawing and report any discrepancies.
- This drawing should be read in conjunction with all other relevant drawings and specifications.
- All building materials, components and workmanship are to comply with the relevant statutory regulations, British Standards and codes of practice and the requirements, standards and practices of the local authorities.
- Use figured dimensions only from relevant drawings.
- Any dimensions, errors or omissions are to be reported to the project coordinator for instruction and clarification before commencement of works.
- The engineer does not accept responsibility for information, design advice or details contained in any unofficial drawings for construction, issued for tender or other purposes.

VENTILATION MVHR UNITS DRAWINGS

NOTES

1 MVHR UNITS SHALL BE MOUNTED WITH RUBBER ANTI-VIBRATION HANGERS FROM THE CONCRETE SLAB U.N.O. CONNECTIONS TO THE DISTRIBUTION DUCTWORK SHALL BE MADE WITH ANTI-VIBRATION COUPLERS.

2 MVHR UNITS SHALL BE PROVIDED WITH THE MANUFACTURERS PROPRIETARY ATTENUATION POD

3 MVHR UNITS SHALL BE PROVIDED WITH THE MANUFACTURERS PROPRIETARY ATTENUATION POD

4 DUCTWORK SHALL BE SUPPORTED ON ANTI-VIBRATION MOUNTS.

LEGEND

AC	AIR CONDITIONING INTERNAL UNIT
ACCU	AIR COOLED CONDENSING UNIT
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
ATT	ATTENUATOR
BDD	BACK DRAUGHT DAMPER
CT	CONDENSATION TRAP 200 CONDENSATE TO DRAIN INTO SOIL PIPE VIA HL920 DRY TRAP
EF	EXTRACT FAN
EG	EXTRACT GRILLE
FA	FROM ABOVE
FB	FROM BELOW
FC	FLEXIBLE CONNECTION
FD	FIRE DAMPER
HF	HIGH LEVEL
KH	KITCHEN HOOD
L	LOUVRE
LL	LOW LEVEL
MVHR	MECHANICAL VENTILATION HEAT RECOVERY UNIT
ODD	OPPOSED BLADE DAMPER
SG	SUPPLY GRILLE
SD	SPIGOT DAMPER
S	SUPPLY
TA	TO ABOVE
TB	TO BELOW
VCD	VOLUME CONTROL DAMPER

Client
OSM Construction

Project
Premium House
Worthing
BN11 2BJ

Drawing
Typical Floor
Mechanical Ventilation and Associated Noise Mitigation Measures.

TENDER

CORINDALE CONSULTING

File Name
23-142-CDC-00-XX-DR-M-1001-S4

Status
P04

Appendix B – Insul Predictions

Please note that whilst Insul does not always show things entirely accurately from a pictorial point of view, the method for choosing the materials is.

Wall W1

Sound Insulation Prediction (v8.0.0)

Program copyright Marshall Day Acoustics 2014

Acoustic South East - Key No. 0378

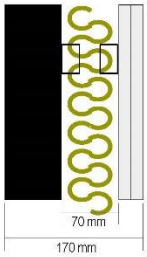
Margin of error is generally within Rw +/- 3 dB

Job Name:

Job No.: Page No.: Notes:

Date: 22 Feb 24 Initials:Simon Barrett

File Name: W1.ixl



Rw	72 dB
C	-2 dB
C_{tr}	-9 dB
D_{nTw}	74 dB [V:50m3] [A:11m2]

System description

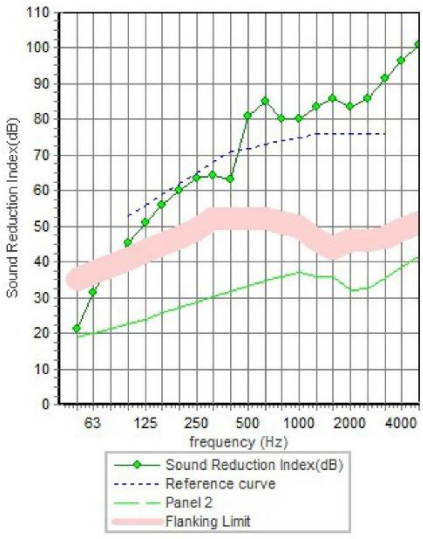
Panel 1 : 1 x 70.0 mm Brick (?:1600 kg/m3,E:8.9GPa,?:0.01)

Cavity: Double steel stud ,Stud spacing 600 mm , Infill Fibreglass (10kg/m3) Thickness 50 mm (?:36 kg/m3, Rf:4000 Pa.s/m2)
Panel 2 + 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01) + 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01)

Mass-air-mass resonant frequency =43 Hz

frequency (Hz)	R(dB)	R(dB)
50	21	
63	31	26
80	39	
100	46	
125	51	49
160	56	
200	60	
250	63	62
315	64	
400	63	
500	81	68
630	85	
800	80	
1000	80	81
1250	84	
1600	86	
2000	84	85
2500	86	
3150	91	
4000	96	95
5000	101	

Panel Size 2.7x4 m



Wall W2

Sound Insulation Prediction (v8.0.0)

Program copyright Marshall Day Acoustics 2014

Acoustic South East - Key No. 0378

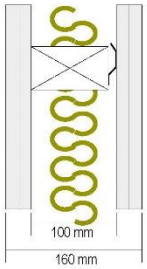
Margin of error is generally within Rw +/- 3 dB

Job Name:

Job No.: Page No.: Notes:

Date: 22 Feb 24 Initials:Simon Barrett

File Name: W2.ixl



Rw	59 dB
C	-3 dB
C_{tr}	-7 dB
D_{nTw}	61 dB [V:50m3] [A:11m2]

System description

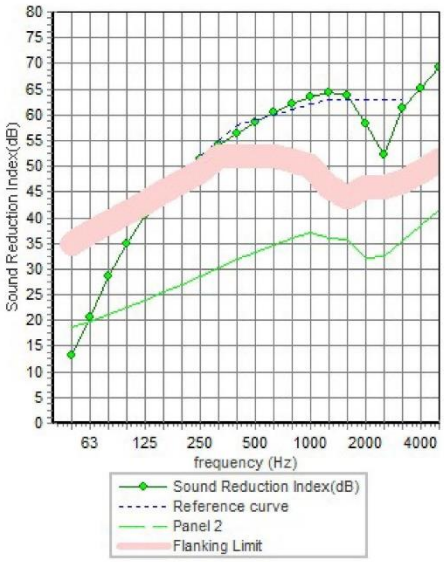
Panel 1 : 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01) + 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01)

Cavity: Timber stud + resil. rail/bar ,Stud spacing 600 mm , Infill Fibreglass (10kg/m3) Thickness 50 mm (?:36 kg/m3, Rf:4000 Pa.s/m2)
Panel 2 + 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01) + 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01)

Mass-air-mass resonant frequency =46 Hz

frequency (Hz)	R(dB)	R(dB)
50	13	
63	20	17
80	29	
100	35	
125	40	38
160	45	
200	48	
250	51	51
315	54	
400	56	
500	59	58
630	60	
800	62	
1000	63	63
1250	64	
1600	64	
2000	58	56
2500	52	
3150	61	
4000	65	64
5000	69	

Panel Size 2.7x4 m



Wall W3

Sound Insulation Prediction (v8.0.0)

Program copyright Marshall Day Acoustics 2014

Acoustic South East - Key No. 0378

Margin of error is generally within Rw +/- 3 dB

Job Name:

Job No.:

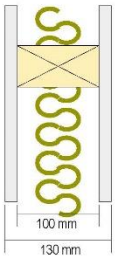
Page No.:

Notes:

Date: 22 Feb 24

Initials:Simon Barrett

File Name: W3.ixl



Rw	40 dB
C	-4 dB
C_{tr}	-12 dB
D_{nTw}	42 dB [V:50m3] [A:1/m2]

System description

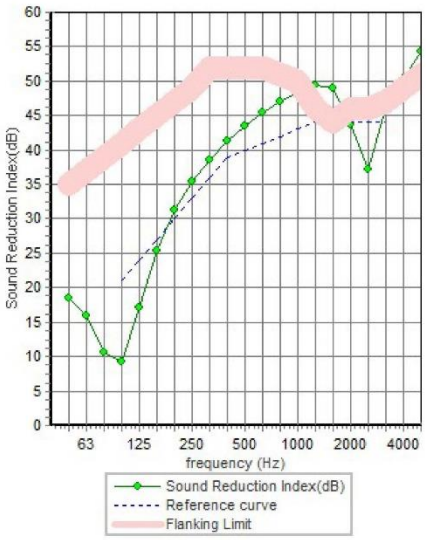
Panel 1 : 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01)

Cavity: Timber stud ,Stud spacing 600 mm , Infill Fibreglass (10kg/m3) Thickness 50 mm (?:36 kg/m3, Rf:4000 Pa.s/m2)
Panel 2 + 1 x 15.0 mm Gyproc SoundBloc 15mm (?:840 kg/m3,E:3.1GPa,?:0.01)

Mass-air-mass resonant frequency =67 Hz

frequency (Hz)	R(dB)	R(dB)
50	18	
63	16	14
80	11	
100	9	
125	17	13
160	25	
200	31	
250	35	34
315	39	
400	41	
500	43	43
630	45	
800	47	
1000	48	48
1250	49	
1600	49	
2000	44	41
2500	37	
3150	46	
4000	50	49
5000	54	

Panel Size 2.7x4 m



Floor/Ceiling F1+C1

Impact Sound Prediction (v8.0.0)

Program copyright Marshall Day Acoustics 2014

Acoustic South East - Key No. 0378

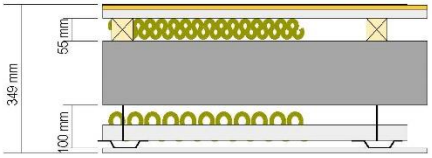
Margin of error for Impact Sound Prediction is generally within Ln,w +/- 5 dB

Job Name:

Job No.: Page No.: Notes:

Date: 22 Feb 24 Initials:Simon Barrett

File Name: F1+C1.ixl



Ln,w 34 dB

C_1 3 dB

System description

Floor Cover: None (Measured)

Panel 1 : 1 x 10.0 mm mm TriBoard (?:605 kg/m3,E:2.9GPa,?:0.01) + 1 x 20.0 mm Rubber (?:920 kg/m3,E:0.03GPa,?:0.20)

Cavity: Solid joist(timber or Twinaplate) @ 600 mm , Infill Fibreglass (10kg/m3) Thickness 50 mm

Panel 2 + 1 x 152.0 mm Concrete (?:2340 kg/m3,E:11GPa,?:0.04)

Cavity: Suspended light steel grid @ 600 mm , Infill Fibreglass (10kg/m3) Thickness 60 mm

Panel 3 + 1 x 12.5 mm Gyproc Wallboard 12.5mm (?:640 kg/m3,E:1.6GPa,?:0.01)

Mass-air-mass resonant frequency =53 Hz , 68 Hz

Panel Size 2.4x2.4 m

frequency (Hz)	Ln(dB)	Ln(dB)
50	70	
63	68	72
80	53	
100	51	
125	42	52
160	41	
200	40	
250	35	42
315	33	
400	31	
500	30	35
630	28	
800	26	
1000	24	29
1250	22	
1600	20	
2000	18	23
2500	18	
3150	16	
4000	17	21
5000	15	

