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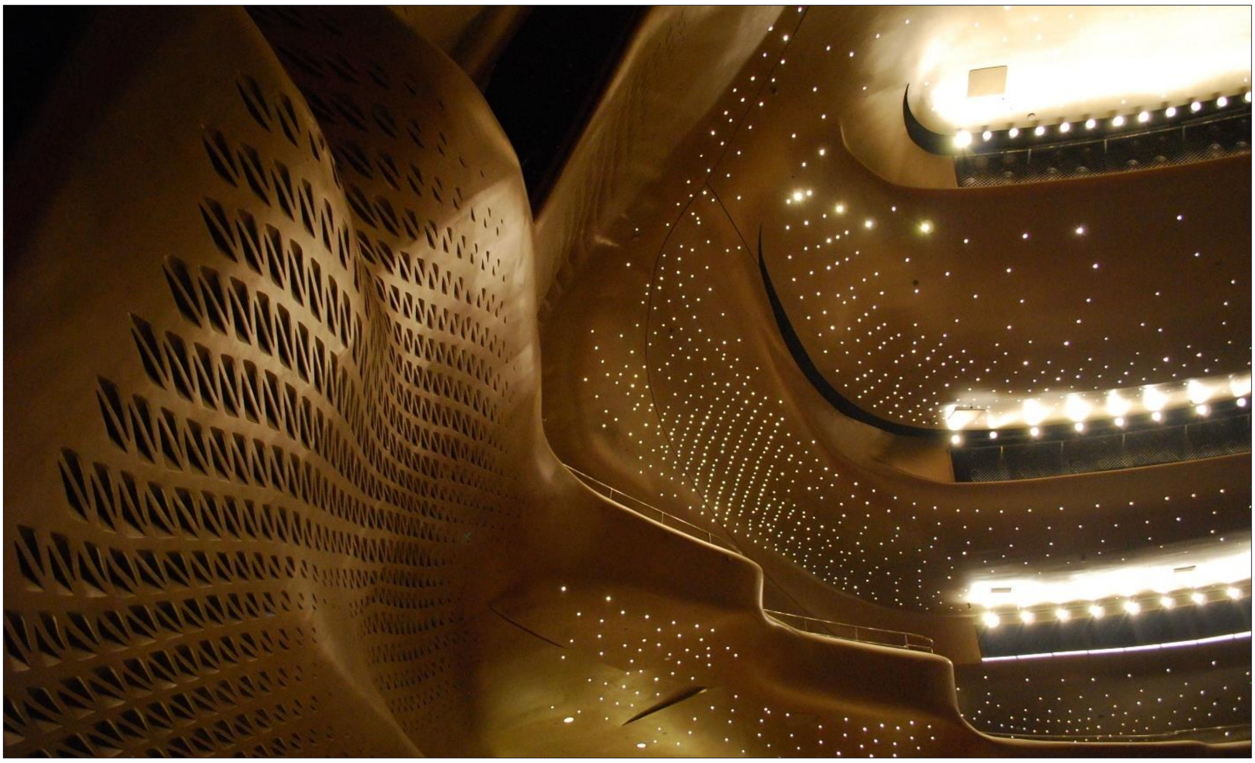

FIELD TEST WALL TECHNOLOGIES

SUPA PANEL

TEST DATE: 23 MARCH 2020

APARTMENT WALL SYSTEM 1A – WIDTH 177 mm

13 mm Knauf RE Board
51 mm Steel stud
75 mm 14 kg/m^3 Bradford glasswool
20 mm clear gap
64 mm Panel
16 mm batten
no insulation
13 mm Knauf Fireshield

$D_{nT,w}$ 56 : $D_{nT,w} + C_{tr}$ 47

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2 April 2020

K8 Australia Pty Ltd
7/344 Lorimer Street
Port Melbourne Vic 3207

Attention: Mr David Visser

Dear David

WALL SYSTEM TESTING

This letter details the results of airborne sound insulation testing of proto-type wall panel systems.

INTRODUCTION

Marshall Day Acoustics Pty Ltd (MDA) has been commissioned by K8 Australia Pty Ltd to undertake airborne sound insulation testing of proto-type wall panel systems within their dedicated test facility.

This letter presents the results of testing conducted on 23 March 2020.

TEST FACILITY

The test facility consists of a large rectangular space within an existing office/warehouse space. The room has been constructed with bounding walls consisting of two layers of 13mm fire-rated plasterboard each side of steel studs. Services ductwork has also been clad as shown in Figure 1.

Figure 1: Bounding walls

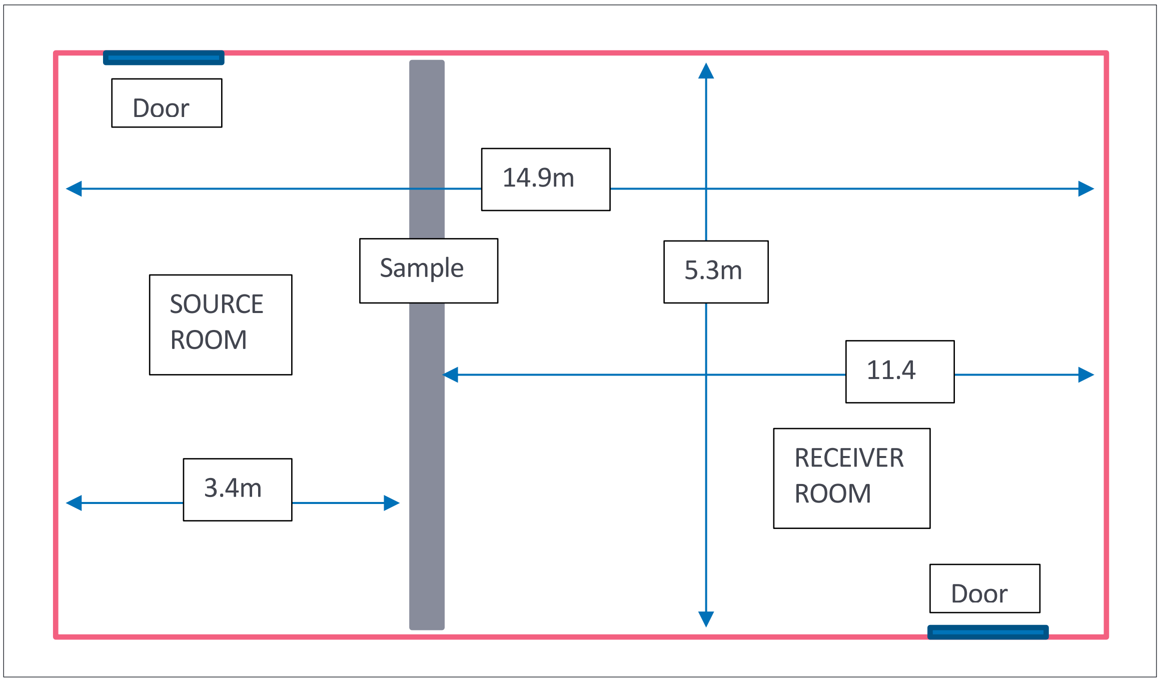
The test sample is to be mounted at a dedicated location to divide space into two separate rooms. The sample location includes a structural break to limit sound flanking via the bounding walls. The structural break is shown in Figure 2. The break has subsequently been packed with rubber.

Figure 2: Structural break in bounding wall

Access doors to each end of the space have been located diametrically opposite and include raised thresholds to limit sound leakage.

With the test sample installed, the space is divided into two separate spaces with dimensions as shown in Figure 3.

Figure 3: Room dimensions



The Bondek slab above the space is at a height of 3.35m. An acoustic tile ceiling has been installed in the receiving room at a height of 3m with a 300mm wide margin around the perimeter and at bulkheads.

Carpet tiles have been installed throughout the receiver room and acoustic tiles have been installed as wall panels at the end of the room. The tiles are arranged in a tegula fashion and bags of acoustic insulation were laid on the floor of the receiver room to assist with diffusion. A slight flutter echo is noticeable across the room.

TEST SAMPLE

The test sample was mounted within the aperture, which has dimensions of 5.3 m wide x 3 m high.

The wall system test sample measured on 23 March 2020 was constructed as follows:

- 13 mm Knauf RE Board (650 kg/m^3 density) (receiver side)
- 51 mm steel stud
- 75 mm thick, 14 kg/m^3 Bradford glasswool insulation
- 20 mm clear gap
- 64 mm thick panel (380 kg/m^3 density ; 0.35 mm thick steel skins)
- 16 mm steel batten (no cavity insulation)
- 13 mm Knauf Fireshield (800 kg/m^3 density) (source side)

The panel can be described as a steel encased, aerated concrete panel system with a proprietary joint detail. The wall panel was mounted within steel tracks top and bottom and abutted the bounding walls on one side of the structural break only.

The wall panel had been installed in accordance with a typical installation detail for a riser shaft, i.e. all caulking and sealing was completed from one side only, in this case the source room side. The lining on battens was mounted on the source room side of the wall. The separate stud lining was mounted on the receiver room side.

The separate stud arrangement is shown in Figure 4.

Figure 4: Separate stud arrangement

TESTING METHODOLOGY

Airborne sound insulation tests were carried out in general accordance with the guidance provided in ISO 16283:2014 *Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation*.

The test procedure for airborne sound insulation tests involves generating high sound pressure levels of 'pink noise' via a loudspeaker in one 'source' room and measuring the resulting noise level in the adjacent 'receiver' room.

The receiver noise levels are subtracted from the source noise levels in order to derive a single, normalized test result value, which is corrected for reverberation time to account for room acoustic conditions in the receiver room.

Due to the room dimensions, a fully reverberant sound field was unable to be generated within the receiver room, with a measured noise level drop-off of 4dB from one end of the room to the other. Therefore, to be conservative, the receiver room measurement was conducted within 1-2m of the test sample.

All sound level measurements were conducted using a Rion NA-27 Sound Level Meter (Serial No.0270190) which was calibrated before and after the testing using a Rion NC-74 calibrator (Serial No.51230896).

The reverberation time within the receiver room as measured using a Brüel & Kjær 2250 Sound Level Meter (Serial No.2693809).

The measurement period in each location was a minimum of 30 seconds using a microphone sweep method.

The measurement results were derived in accordance with ISO 717-1:2013 *“Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation”.*

In addition to the above, a number of measurements were conducted at various locations within the room and surrounding spaces to confirm that the test was not contaminated by flanking noise or sound leakage.

It was noted that some high frequency sound leakage was apparent at some of the poorly aligned panel junctions which resulted in a deficiency of 2dB compared to well aligned junctions.

Higher noise levels were also noted at the partition head, however this is expected due to the presence of a bulkhead within 300mm of the wall. Therefore, it was considered that sound transmission at the perimeter of the wall was relatively consistent.

TEST RESULTS

The sample was tested on 23 March 2020. The test result is provided in Figure 5.

Figure 5: Sound Insulation Test Results

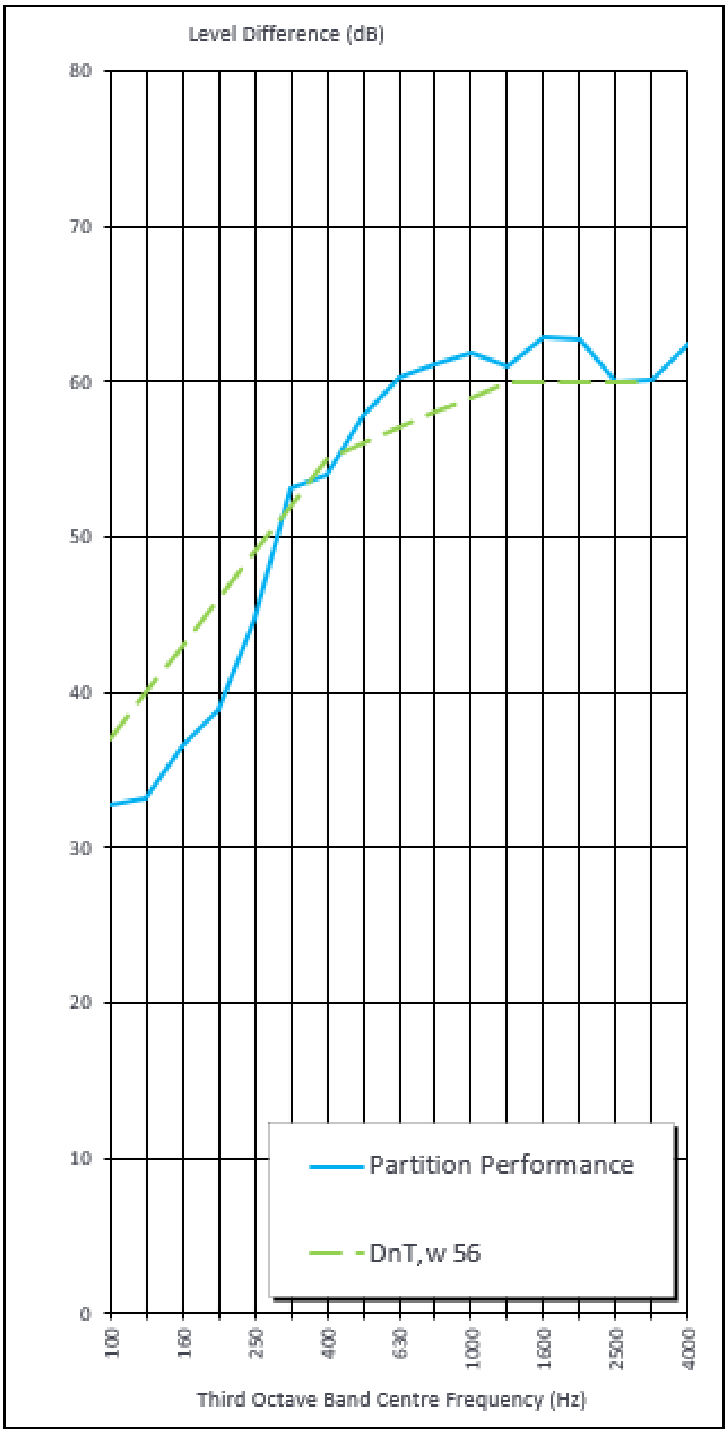
Job Title: K8 Australia testing
'S **Job No:** 20200246
Client: K8 Australia
Test Date 23/03/2020
System: APARTMENT WALL SYSTEM 1A - 13mm Knauf Fireshield + 16mm batten + no insul + 64mm wall + 20mm gap + 51mm stud + 75/14 Bradford gw + 13mm Knauf RE Board

Frequency (Hz)	DnT * (dB)	Adverse Deviation (dB)	Receiving RT (s)
50			
63			
80			
100	32.7	4.3	0.8
125	33.1	6.9	0.7
160	36.5	6.5	0.7
200	38.8	7.2	0.5
250	44.6	4.4	0.6
315	53.1		0.6
400	53.9	1.1	0.5
500	57.8		0.4
630	60.3		0.4
800	61.1		0.4
1000	61.8		0.4
1250	61.0		0.4
1600	62.8		0.5
2000	62.8		0.5
2500	59.9	0.1	0.4
3150	60.1		0.4
4000	62.4	-	0.4
Sum of Adverse Deviations			30.4

* **Bold** results indicate limits of measurement due to background noise

DnT,w	56
$C_{,100\text{-}3150}$	-3
$C_{tr,100\text{-}3150}$	-9

Area of test partition (m^2)	
Source Room Volume (m^3)	
Receiving Room Volume (m^3)	



We trust that the above meets your requirements at this time. Please feel free to contact us if you have any queries.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD

Alistair Bavage

Director