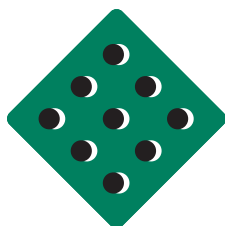
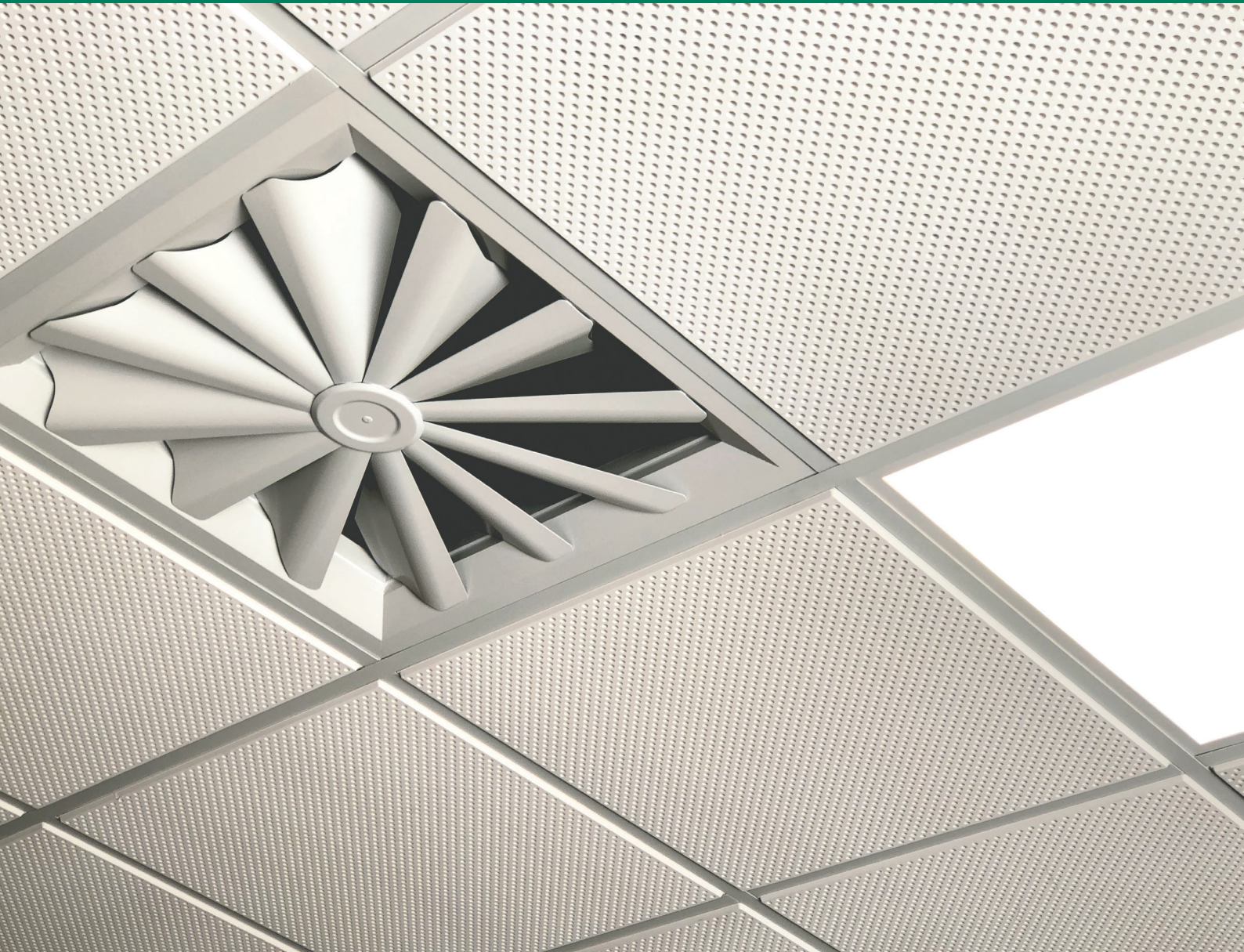


# Australian Plaster Acoustics

Quiet Sound – Ultimate Plaster Acoustic Ceiling Tiles



AUSTRALIAN  
**PLASTER ACOUSTICS**

Innovative Sound Solutions





COVER AND THIS PAGE ECOCHECK INSTALLATION  
HUMPTY DOO SENIOR SCHOOL  
DARWIN NT AUSTRALIA



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SHADEX INSTALLATION

ZUCCOLI PRIMARY SCHOOL  
DARWIN NT AUSTRALIA



## Quiet Sound ULTIMATE COLLECTION

The **Quiet Sound** Ultimate collection was developed from our *Standard Range of Plaster Acoustic Ceiling Tiles*. It involved major research and development that highlighted the substantial relationship between acoustic performance and the weight of the tiles. As a consequence of research and development, the **Quiet Sound** collection provides:

- New innovative modern designs only achievable from cast plaster
- Exceptionally sharp tile profiles possible only with the use of silicone rubber moulds
- Higher acoustic & sound transmission properties
- Lightweight properties which allow lighter structural ceiling grid
- Easier installation
- Easier packaging & transportation

The **Quiet Sound** consists of perforated ceiling tiles and panels, perfect for acoustic engineers architects and interior designers who are looking for aesthetic designs coupled with high acoustic properties. **Quiet Sound** provides subtle innovative solutions for creating a unique, decorative finish giving many benefits.

### KEY SELECTION ATTRIBUTES

- Cost effective ceiling and wall solution
- High-quality product
- Decorative or non-decorative
- High humidity performance. Our acoustic tiles and panel do not sag in humid conditions. They are able to withstand high humidity and temperature from 0° to 80°C
- Dimensional stability up to 95% humidity
- Anti-mould paint applied at the time of manufacture which stops growth of mould (Tiles are prepainted white)
- Simple installation Plaster Acoustic Tiles.
- Plaster glass panels screw fix to steel or timber battens
- Flush jointing
- High acoustic performance – all products having NRC ranges between 0.75 to 0.80
- CAC between 32 to 45 dB for acoustic ceiling tiles
- Reduces noise reverberation
- Prevents dust entering into room space
- Reduces echo
- Able to distinguish between music and speech
- Fire rated to group 1 certification
- High light reflective
- Good R values in plaster acoustic tiles 0.80 thermal resistance
- All products 100% Australian made

All acoustic tests for NRC carried out by RMIT University of Melbourne and CSIRO Melbourne in accordance with ASTM-C423-90A NRC (Noise Reduction Coefficient)

Acoustic tests for CAC (Ceiling Attenuation Class) carried out by Acoustic Laboratories Australia Pty Ltd in accordance with ASTM E1414/E1414 M 11A for CAC



## APPLICATIONS

- Commercial office buildings
- Show rooms
- Schools and universities
- Restaurants, cafes, food halls
- Retail complexes
- Shopping centres
- Auditoriums and concert halls
- Libraries and galleries
- Cinemas
- Home theatres
- Foyers for public buildings
- Music rooms
- Public Domains
- Health Care Areas

## THE ULTIMATE COLLECTION CONSISTS OF

### 1. Lightweight plaster acoustic ceiling tiles for exposed grid ceiling system

Four modern designs that have excellent NRC and CAC properties, made to suit 600 x 600mm steel or aluminium grid systems.

### 2. Plaster acoustic ceiling tiles for concealed direct fixing

Two striking designs for V-edged finish, giving exceptional NRC and CAC properties. These are made to be directly fixed to furring channels.

## ECOCHECK INSTALLATION

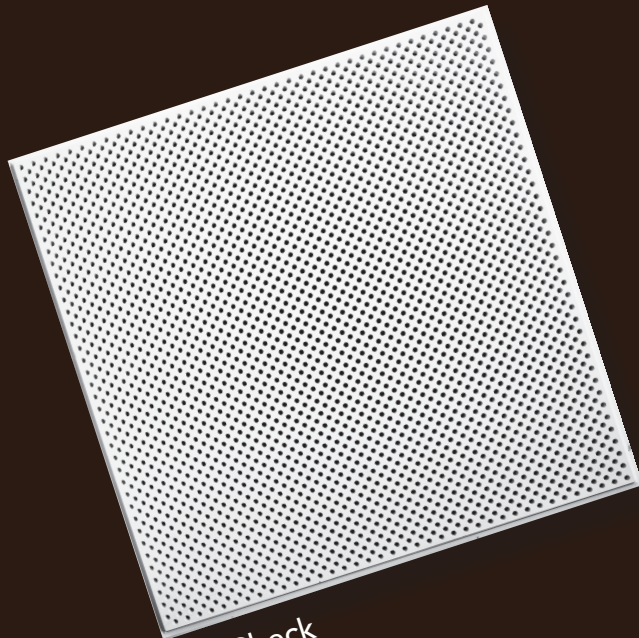
ARB 4X4 ACCESSORIES SHOWROOM  
DARWIN NT AUSTRALIA



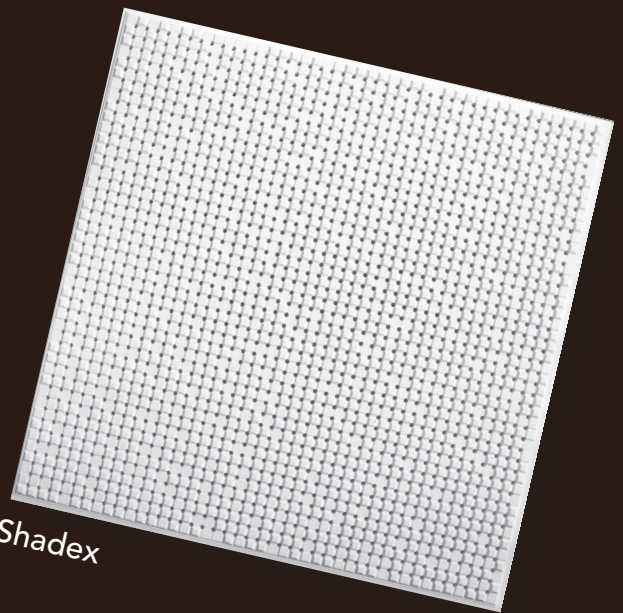


## LIGHT WEIGHT PLASTER ACOUSTIC CEILING TILES

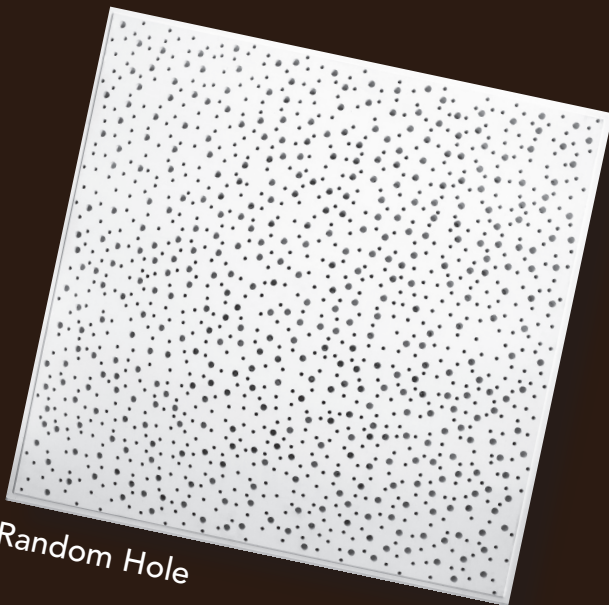
- made from silicon rubber moulds giving a sharp and distinctive attribute



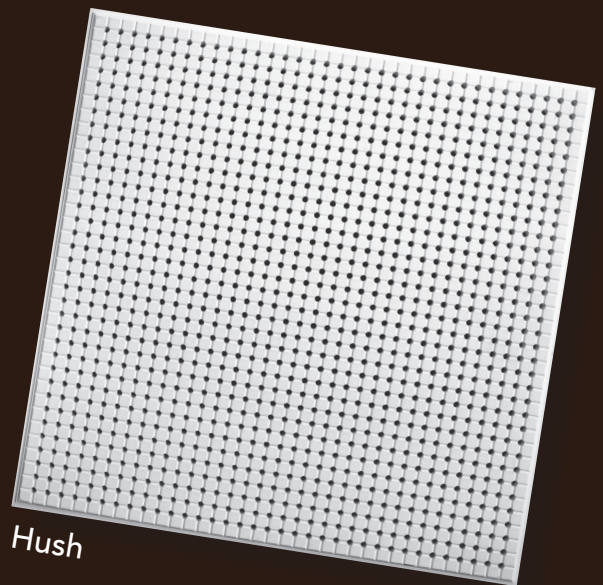
EcoCheck



Shadex



Random Hole



Hush



# LIGHT WEIGHT PLASTER ACOUSTIC CEILING TILES

- for exposed grid ceiling systems.

Plaster acoustic ceiling tiles are manufactured from reinforced casting plaster and offer excellent sound absorption, controlled sound transmission and decorative finishes.

The tiles are supplied with an integrated sound absorbent batt inserted during casting and are produced in a range of varying designs. These tiles are pre-painted white.

## ACOUSTIC PROPERTIES

These tiles measure 30mm thick, 600 x 600mm with a 20mm thick sound absorbent batt giving a high NRC and CAC value.

## ADVANTAGES

1. Dimensionally stable will not warp or buckle
2. Not affected by humidity
3. Fire resistant
4. Acoustic properties
5. Redecoration does not affect the properties
6. Easy removal and replacement
7. Mass 12.32 kg/m<sup>2</sup>

## PLASTER ACOUSTIC TILE RANGE :

### ECOCHECK

a diamond pattern tile

### SHADEX

a multi-level faced tile

### HUSH

a uniform chocolate block pattern tile

### RANDOM HOLE

a plain faced tile with Random Hole circular perforations over the entire face



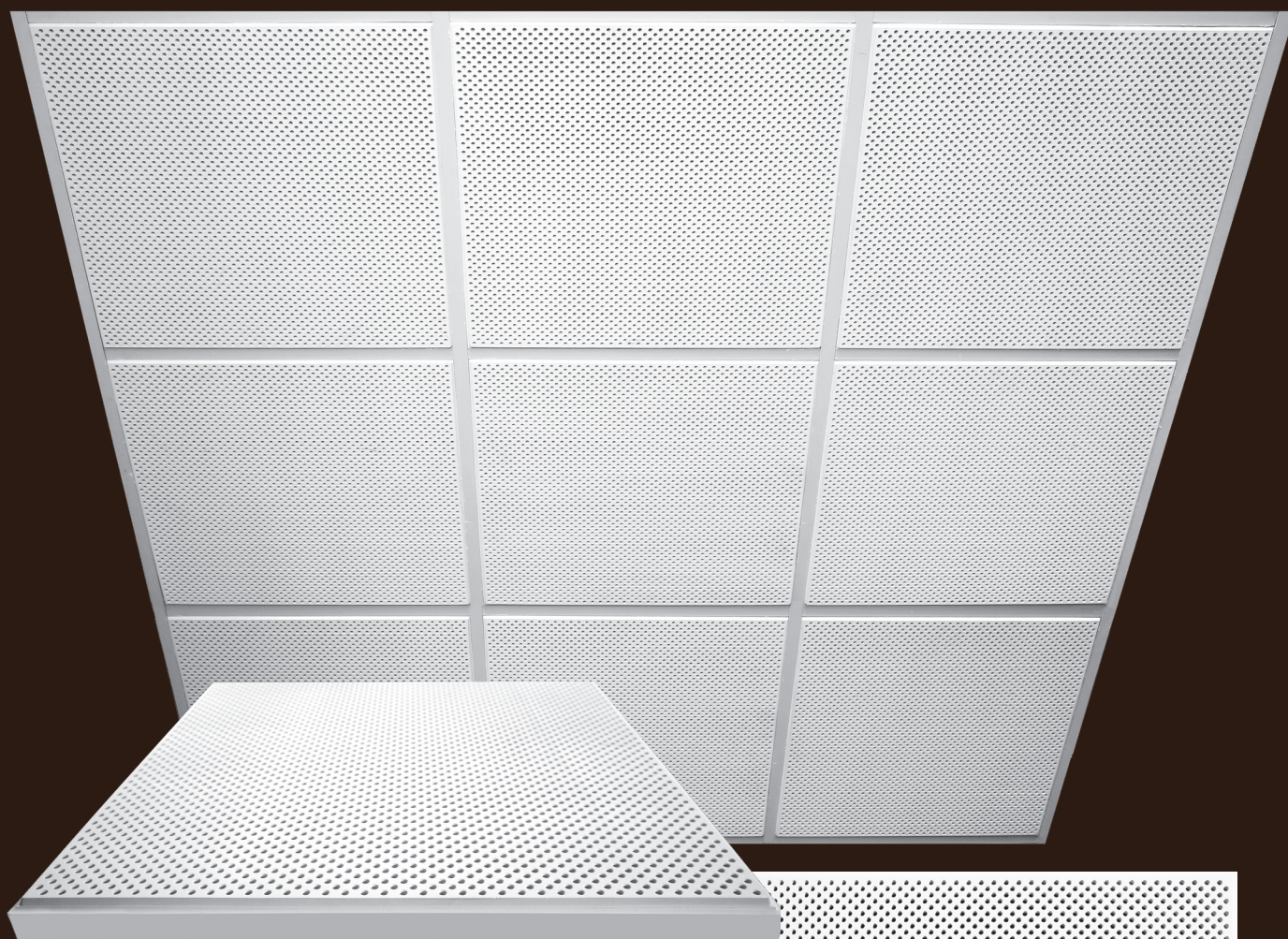


## ECOCHECK INSTALLATION

HUMPTY DOO SENIOR SCHOOL  
DARWIN NT AUSTRALIA



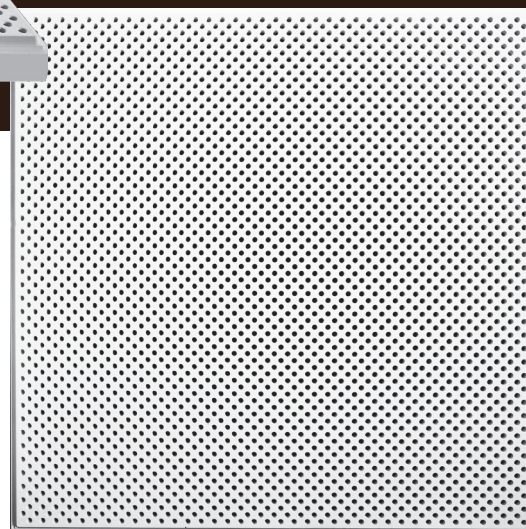
# EcoCheck



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## PROPERTIES

- Bevelled edge.
- Insulation is integrated. Fiberglass insulation batt inserted into tile during manufacture. 42Kg/m<sup>3</sup>, 20mm thick Glasswool
- To be used in conjunction with ceiling grid exposed 24mm T Bar steel or aluminum 600 x 600 system.



## EcoCheck ACOUSTIC PERFORMANCE AND SPECIFICATION

Open Area	Thickness mm	Size mm	CAC	R Value	NRC	SAA	$\alpha_w$	% Light Reflective	Mass Kg/m <sup>2</sup>	Weight per Tile Kg
21.3%	30	600 x 600	35	0.80	0.80	0.80	0.75	0.80	12.32	4.44





## SHADEx INSTALLATION

ZUCCOLI PRIMARY SCHOOL  
DARWIN NT AUSTRALIA



# Shadex



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## PROPERTIES

- Bevelled edge.
- Insulation is integrated. Fiberglass insulation batt inserted into tile during manufacture. 42Kg/m<sup>3</sup>, 20mm thick Glasswool
- To be used in conjunction with ceiling grid exposed 24mm T Bar steel or aluminum 600 x 600 system.

## Shadex ACOUSTIC PERFORMANCE AND SPECIFICATION

Open Area	Thickness mm	Size mm	CAC	R Value	NRC	SAA	$\alpha_w$	% Light Reflective	Mass Kg/m <sup>2</sup>	Weight per Tile Kg
10.1%	30	600 x 600	32	0.80	0.75	0.72	0.50	0.80	12.32	4.44





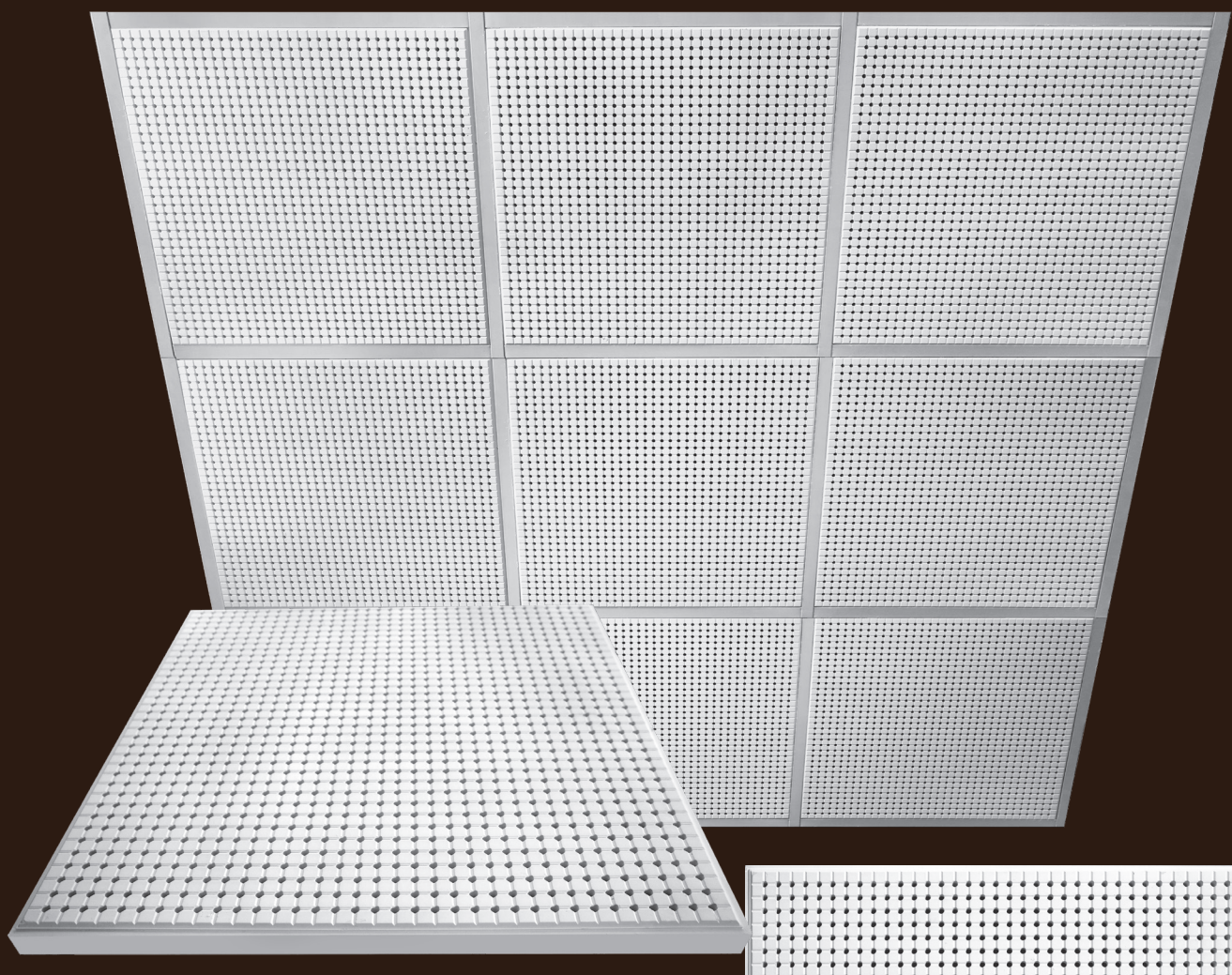
## HUSH INSTALLATION

MINING COMPANY HEAD OFFICE

FANNIE BAY NT AUSTRALIA



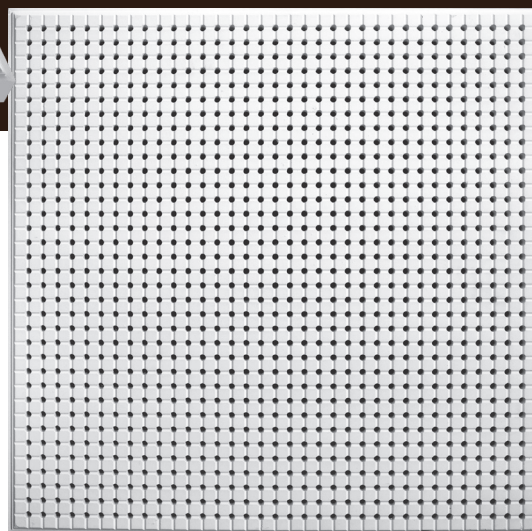
# Hush



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## PROPERTIES

- Bevelled edge.
- Insulation is integrated. Fiberglass insulation batt inserted into tile during manufacture. 42Kg/m<sup>3</sup>, 20mm thick Glasswool
- To be used in conjunction with ceiling grid exposed 24mm T Bar steel or aluminum 600 x 600 system.



Hush ACOUSTIC PERFORMANCE AND SPECIFICATION										
Open Area	Thickness mm	Size mm	CAC	R Value	NRC	SAA	$\alpha_w$	% Light Reflective	Mass Kg/m <sup>2</sup>	Weight per Tile Kg
10.5%	30	600 x 600	34	0.80	0.75	0.72	0.50	0.78	12.32	4.44



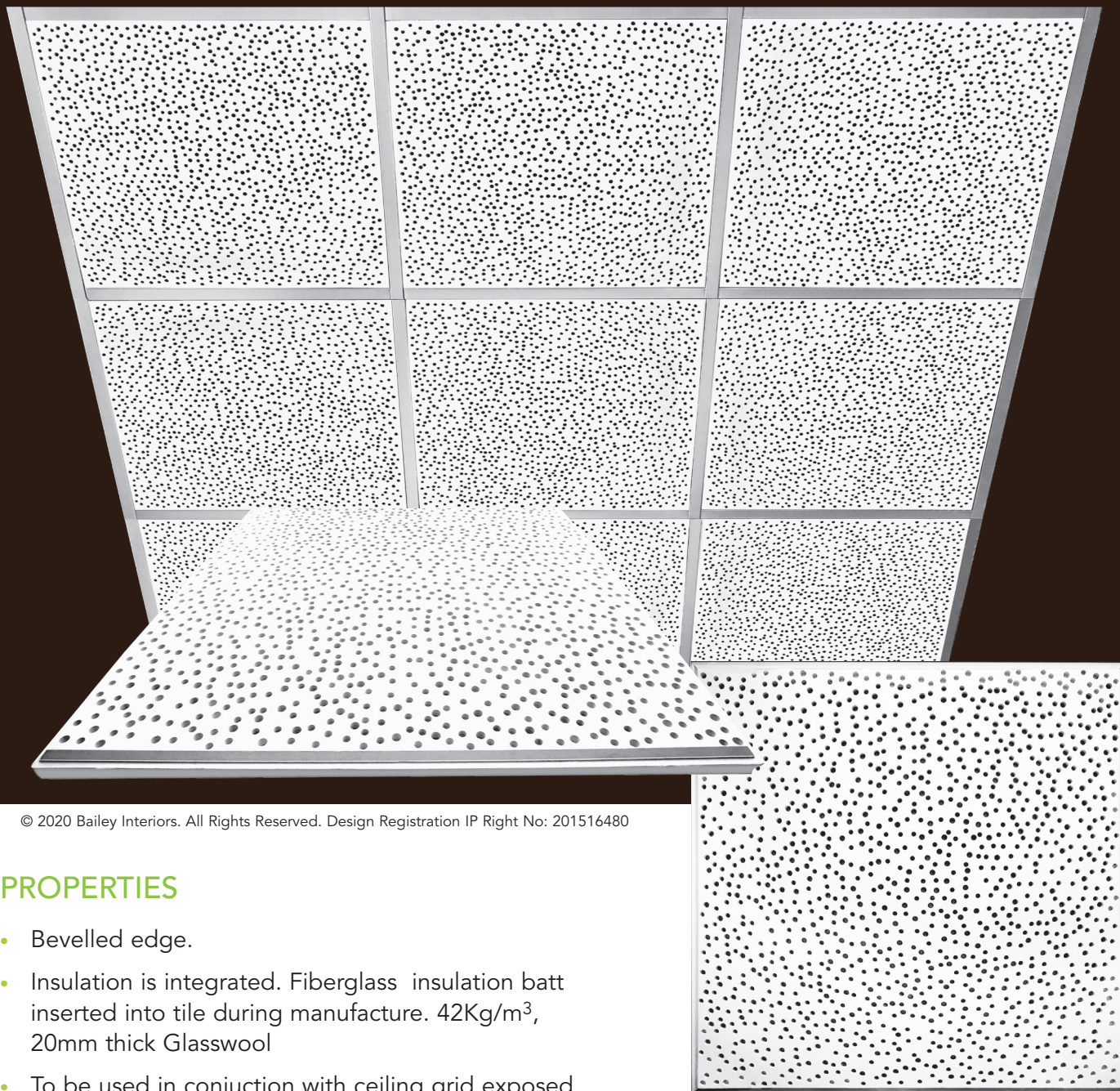


## RANDOM HOLE INSTALLATION

KINGSGROVE RSL SYDNEY NSW AUSTRALIA



# Random Hole



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## PROPERTIES

- Bevelled edge.
- Insulation is integrated. Fiberglass insulation batt inserted into tile during manufacture. 42Kg/m<sup>3</sup>, 20mm thick Glasswool
- To be used in conjunction with ceiling grid exposed 24mm T Bar steel or aluminum 600 x 600 system.

### Random Hole ACOUSTIC PERFORMANCE AND SPECIFICATION

Open Area	Thickness mm	Size mm	CAC	R Value	NRC	SAA	$\alpha_w$	% Light Reflective	Mass Kg/m <sup>2</sup>	Weight per Tile Kg
11.5%	30	600 x 600	35	0.80	0.75	0.73	0.50	0.80	12.32	4.44



# PLASTER ACOUSTIC CEILING TILES

## ■ for concealed direct fixing

These tiles are designed specially for a concealed grid system. Installation is by direct fixing to furring channels.

The tiles are supplied with an integrated sound absorbent batt inserted during casting and are produced in two different patterns.

### ACOUSTIC PROPERTIES

These tiles measure 30mm thick, 600 x 600mm with a 20mm thick sound absorbent batt giving outstanding NRC and CAC results.

### ADVANTAGES

1. Dimensionally stable will not warp or buckle
2. Not affected by humidity, no variance up to 95 % humidity
3. Fire resistant Group 1 Rating
4. Acoustic properties excellent NRC and CAC Rating
5. Mass 12.0-12.5 kg/m<sup>2</sup>

### THE RANGE CONSISTS OF:

#### ECOCHECK NAIL UP CEILING TILE

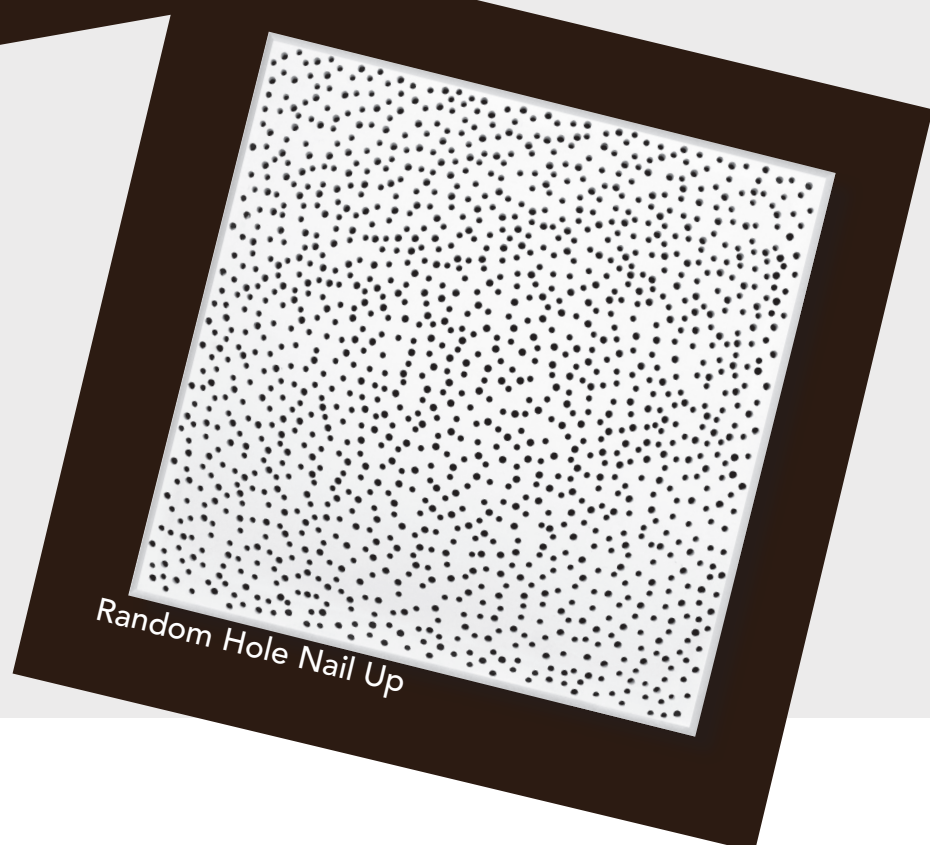
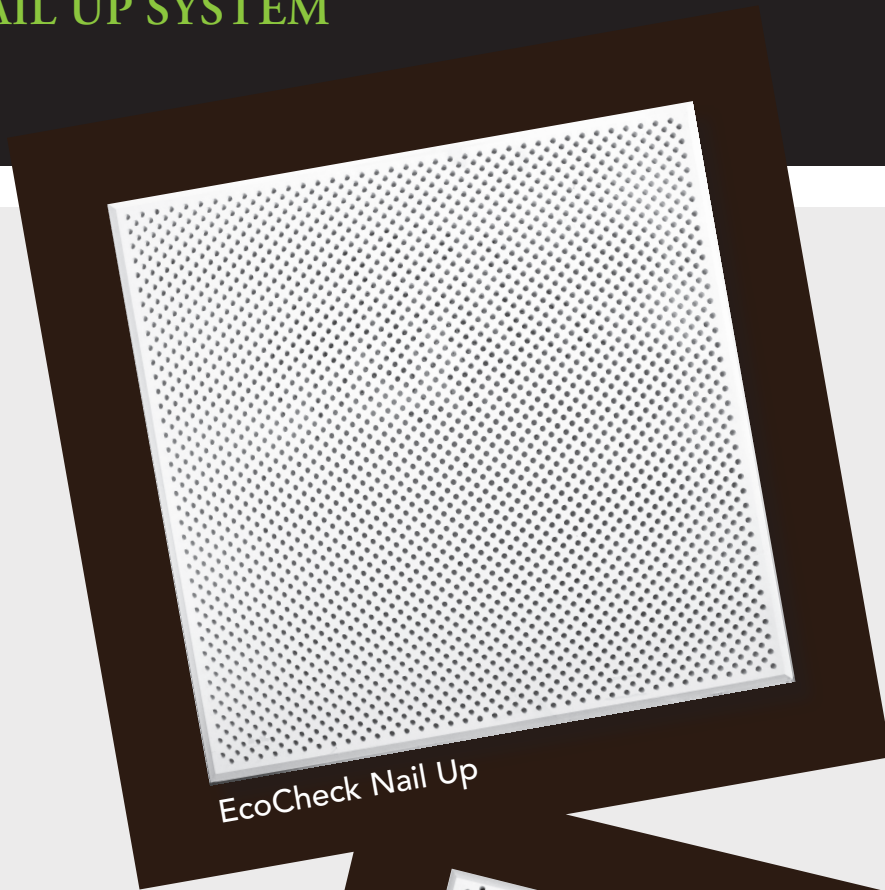
A diamond pattern tile

#### RANDOM HOLE NAIL UP CEILING TILE

A plain faced tile with Random Hole circular perforations over the entire tile



## PLASTER ACOUSTIC CEILING TILES ON NAIL UP SYSTEM





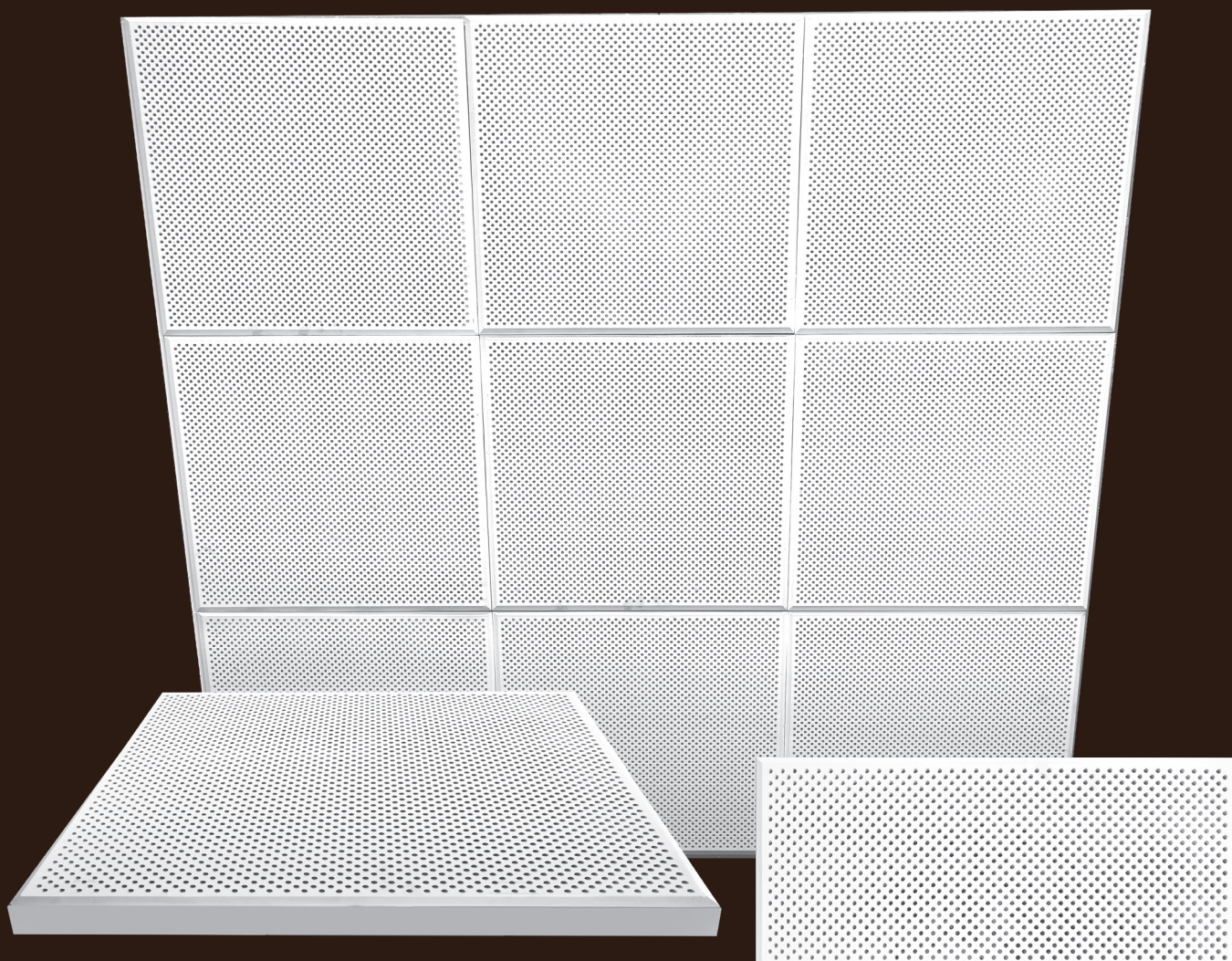


## ECOCHECK DIRECT FIX INSTALLATION

CADENCE OFFICE  
GLADESVILLE NSW AUSTRALIA



# EcoCheck Direct Fix



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## PROPERTIES

- V - edged tile.
- Insulation is integrated. Fiberglass insulation batt inserted into tile during manufacture. 42Kg/m<sup>3</sup>, 20mm thick Glasswool
- To be used in conjunction with concealed Rondo Furring Channel No 155 system.

### EcoCheck DF ACOUSTIC PERFORMANCE AND SPECIFICATION

Open Area	Thickness mm	Size mm	CAC	R Value	NRC	SAA	$\alpha_w$	% Light Reflective	Mass Kg/m <sup>2</sup>	Weight per Tile Kg
21.3%	30	600 x 600	42	0.80	0.85	0.81	0.75	0.80	12.32	4.44





## RANDOM HOLE DIRECT FIX INSTALLATION

LDS CHURCH  
LAMI FIJI



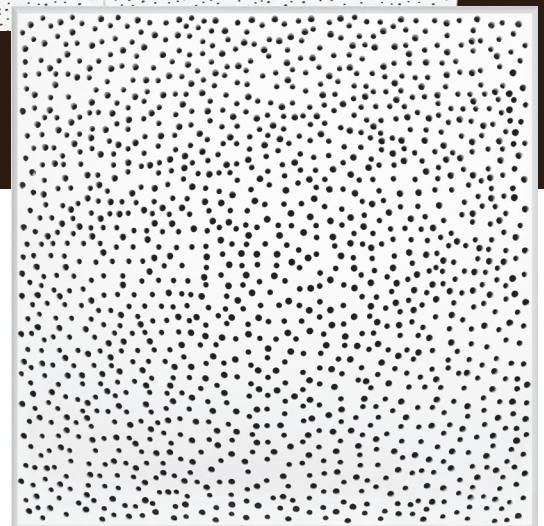
# Random Hole Direct Fix



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## PROPERTIES

- V - edged tile.
- Insulation is integrated. Fiberglass insulation batt inserted into tile during manufacture. 42Kg/m<sup>3</sup>, 20mm thick Glasswool
- To be used in conjunction with concealed Rondo Furring Channel system.



Random Hole DF		ACOUSTIC PERFORMANCE AND SPECIFICATION								
Open Area	Thickness mm	Size mm	CAC	R Value	NRC	SAA	$\alpha_w$	% Light Reflective	Mass Kg/m <sup>2</sup>	Weight per Tile Kg
12.0%	30	600 x 600	38	0.80	0.80	0.75	0.55	0.80	12.32	4.44



## SUMMARY

### LIGHTWEIGHT PLASTER ACOUSTIC TILES – EXPOSED GRID CEILING SYSTEM

Tile Dimensions: 600mm x 600mm x 30mm Thick, Mass 12.20 Kg/m <sup>2</sup>									
Drop in	Open Area	Glasswool					R Value	% Light Reflective	Suspension
		NRC	CAC dB <sup>1</sup>	CAC dB <sup>2</sup>	$\alpha_w$	SAA			
<b>EcoCheck</b>	21.3%	0.80	35	38	0.75	0.80	0.80	0.80	Duo1/Duo x 1200 Duo2/600
<b>Shadex</b>	10.1%	0.75	32	35	0.50	0.72	0.80	0.80	
<b>Hush</b>	10.5%	0.75	34	37	0.50	0.72	0.80	0.78	
<b>Random Hole</b>	11.5%	0.75	35	38	0.50	0.73	0.80	0.76	

### PLASTER ACOUSTIC TILES – CONCEALED DIRECT FIXING

Tile Dimensions: 600mm x 600mm x 30mm Thick, Mass 12.50 Kg/m <sup>2</sup>									
Direct Fix	Open Area	Glasswool					R Value	% Light Reflective	Suspension
		NRC	CAC dB <sup>1</sup>	CAC dB <sup>2</sup>	$\alpha_w$	SAA			
<b>EcoCheck DF</b>	21.3%	0.85	42	45	0.75	0.81	0.80	0.80	Furring Rondo 155
<b>Random Hole DF</b>	12.0%	0.80	38	41	0.55	0.75	0.80	0.80	

1 – CAC Tile only

2 – CAC R3.5 insulation batts, 1800 each side of partition

## SUMMARY - PHYSICAL PROPERTIES

- Material: Glass reinforced plaster
- Surface finish: Factory applied white Anti Mould paint (Plaster acoustic tiles only)
- Flame spread/ fire resistance: Conforms to BCA Spec CI 10 tested to AS/NZS 3837 - 1998 Group 1
- Thermal resistance (R Value): 0.80 m<sup>2</sup>k/w
- Insulation: FBS-1 Glasswool Insulation, 42Kg/m<sup>3</sup>, compressed to 20mm thick, with lightweight black acoustic fabric backing
- This product has a "non-dangerous goods" classification
- Dimensional stability: up to 95% humidity



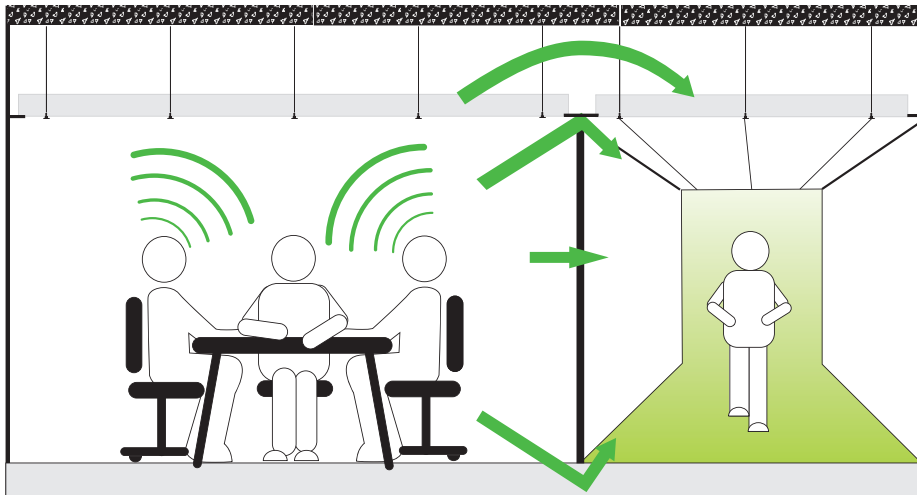
## CAC - Ceiling Attenuation Class

### ABOUT CAC - Ceiling Attenuation Class

CAC is an important measure of sound transfer between adjacent rooms and or a corridor.

Ceiling Attenuation Class indicates the ceilings ability to prevent airborne sound from travelling between adjacent rooms when the dividing wall does not connect with the structural ceiling.

Higher Values are better. A CAC value of 35 dB or above is considered to be very good.



## INSTALLATION

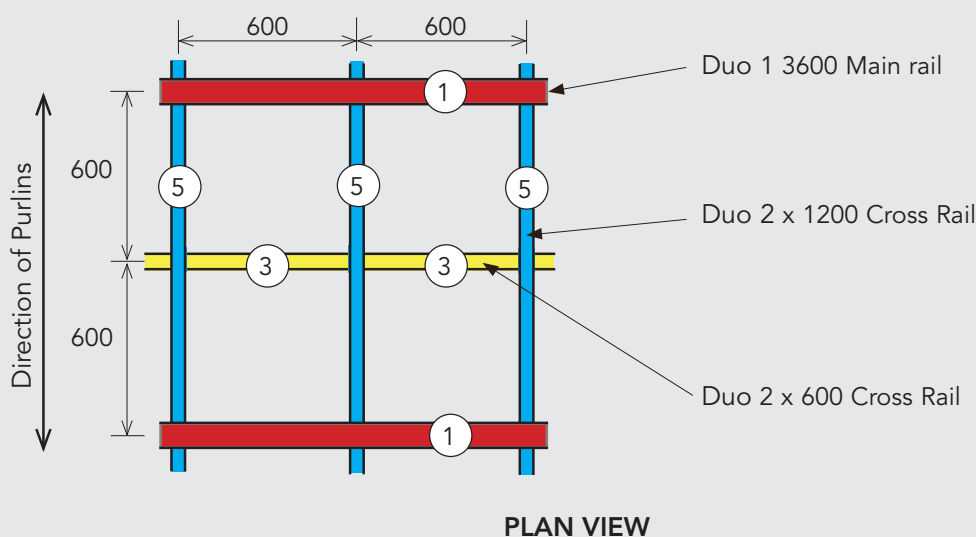
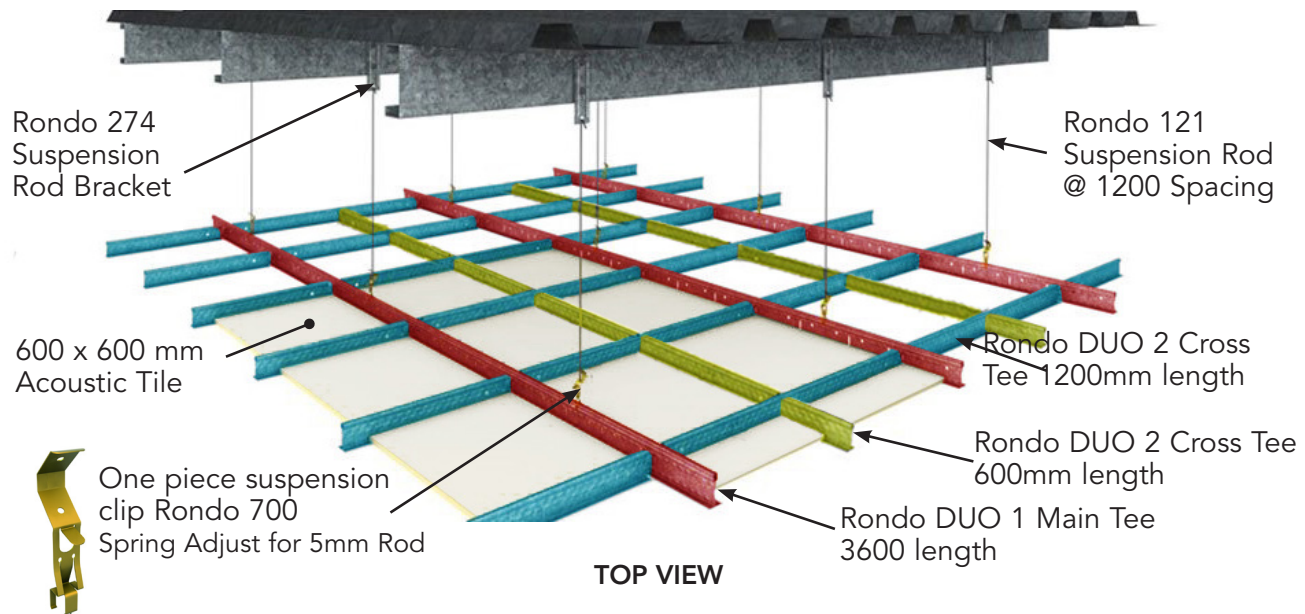
### LIGHT WEIGHT PLASTER ACOUSTIC CEILING TILES, 600 X 600 MM RANGE

1. Plan ceiling layout to provide even margins at the perimeter.
2. Centre the ceiling both ways ensuring centre lines are at right angles.
3. Fix wall angle trim to perimeter walls at the correct height set by a level line. Mitre the wall angle trim around piers and columns.
4. Fix ceiling grid in accordance to Rondo grid layout using Duo system.
5. Cutting tiles can generally be avoided by designing the ceiling so that whole tiles or panels extend as close as practicable to the room area perimeters and then filling to the wall with a plaster board margin.
6. If cutting cannot be avoided the following typical methods are recommended.
  - ✦ When ordering plaster acoustic ceiling tiles make sure to order solid tiles with the same pattern but without the acoustic insulation, these separate tiles will make cutting of the tiles much easier to perform.
  - ✦ Use a router bit to cut panels and tiles to the required size. The router bit rebates the tile to enable installation into the ceiling grid.
  - ✦ Panels and tiles can also be cut to size with a panel saw.
  - ✦ Cable penetrations and sprinkler head holes should be cut into solid tiles or panels using a drill with an appropriate hole saw attachment.
  - ✦ Down light & pipe penetrations should also be cut into solid tiles or panels using a key hole saw or a drill with an appropriate hole saw attachment.



# EXPOSED GRID SYSTEM LAYOUT

## PLASTER ACOUSTIC CEILING TILE 600 X 600 MM RANGE



- 1** The Duo 1 main tee shall be hung on soft galvanize rod or 2.5mm wire, accurately levelled. Suspension clips shall be spaced at 1200mm centres along the Duo 1 main tee.
- 5** Duo 2 main tees to be spaced at 1200mm centres. Duo 2 X 1200 cross tees shall intersect main tees at 600mm centres and be positively locked together.
- 3** Duo 2 x 600 cross tees are to be spaced at 600mm and shall intersect Duo 1200 cross tees at 600mm centres and be positively locked together.

Wall angle shall be securely fixed to the wall at 600mm centres providing a true level edge.

The suspension hangers, main tees and cross tees shall be spaced as not to exceed the design ceiling load, or as required to prevent deflection, in excess of 1/360 of the span of cross tee or main tee.

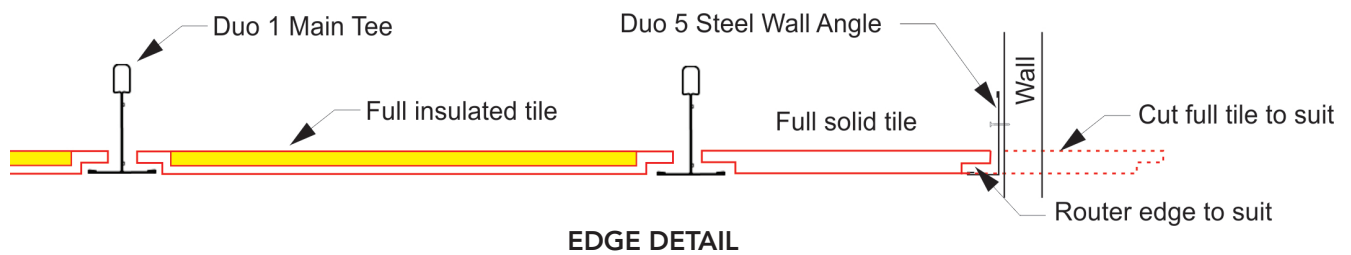
Extra hangers are to be provided for light fittings and conditioning units etc.

All light fittings are to be supported on the main tee.

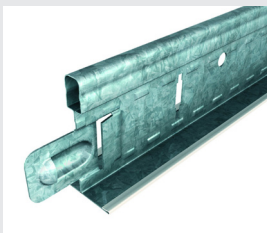


# RONDO DUO SYSTEM COMPONENTS

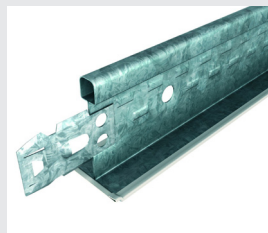
for 600mm x 600mm Grid



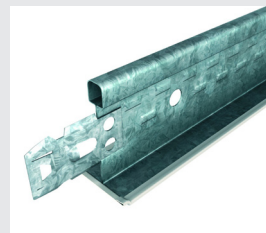
## RONDO DUO COMPONENTS



Rondo DUO 1  
24 x 38mm Main Tee  
3600 mm Length



Rondo DUO 2  
24 x 34mm Cross Tee  
1200 mm Length

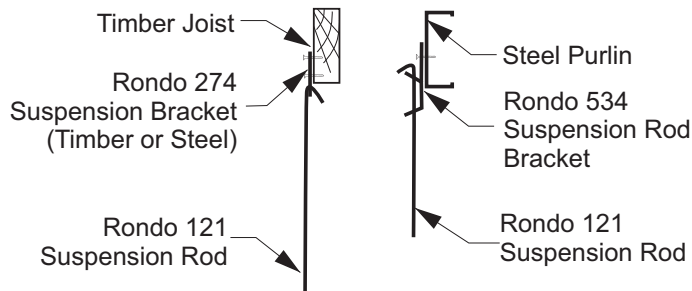


Rondo DUO 2  
24 x 34mm Cross Tee  
600 mm Length

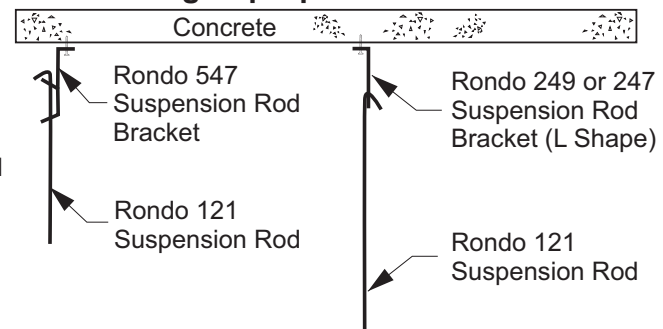


Rondo DUO 5  
25 x 19mm Steel  
Wall Angle

### Direct Fixing Clip Options to Timber or Steel Purlins



### Direct Fixing Clip Options to Concrete



## FIXING DETAIL

## RONDO SUSPENSION ROD HANGERS



Rondo 274  
Suspension Rod Bracket  
(Timber/ Steel)



Rondo 547  
Adjustable Hanger  
(Concrete)



Rondo 534  
Adjustable Hanger  
(Purlins)

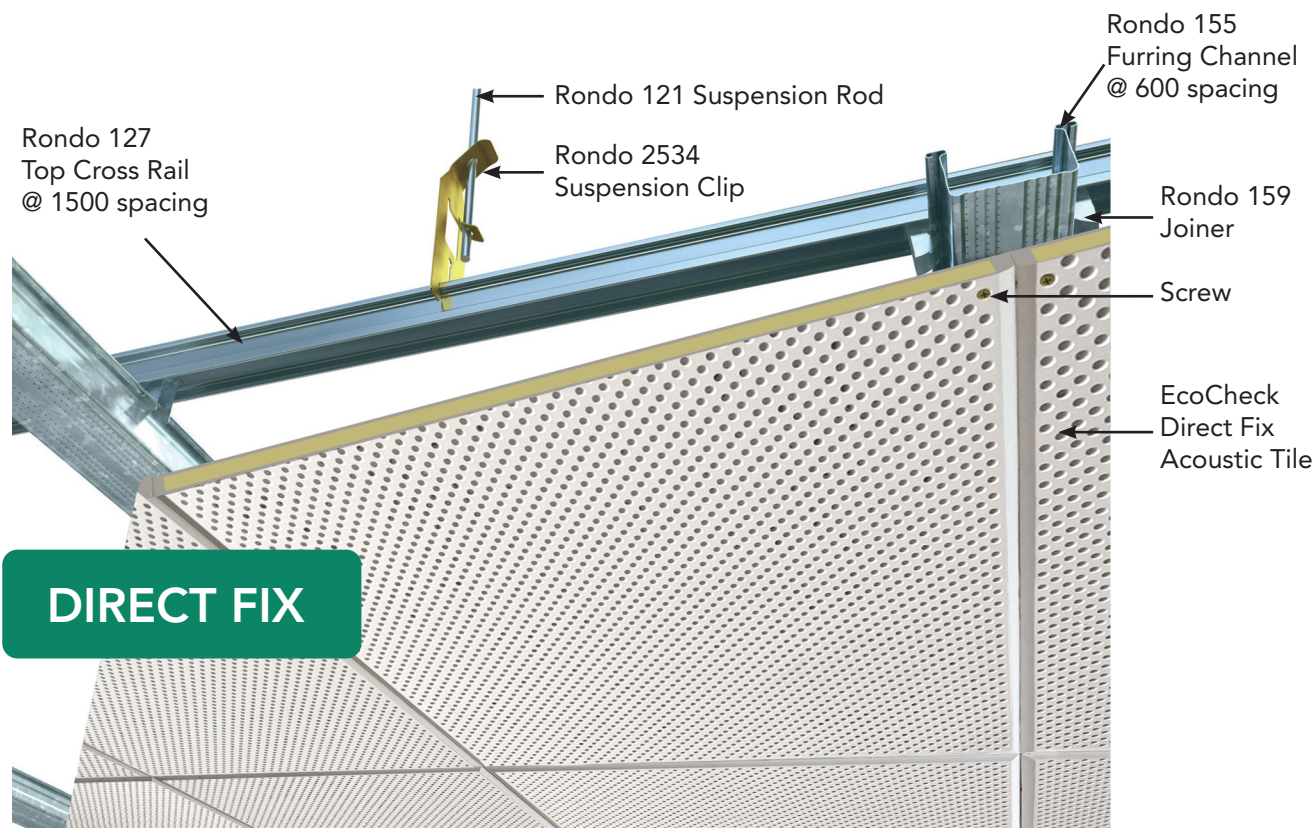


Rondo 247  
Suspension Rod Bracket  
(Concrete)



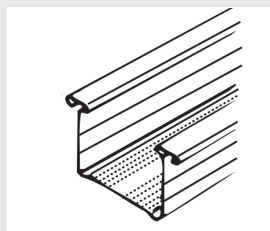
# CONCEALED GRID SUSPENDED CEILING

## PLASTER ACOUSTIC CEILING TILE 600 X 600 MM

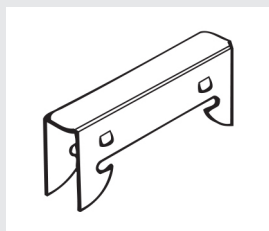


**BOTTOM VIEW** Typical Ceiling Installation with RONDO KEY-LOCK® Ceiling System

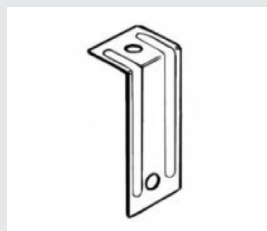
### RONDO KEY-LOCK® Components



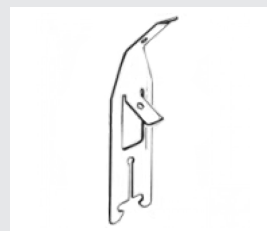
155 Furring Channel



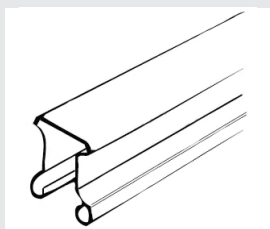
159 Joiner



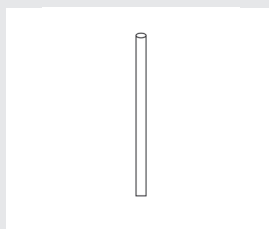
Rondo 247 Suspension Rod Bracket



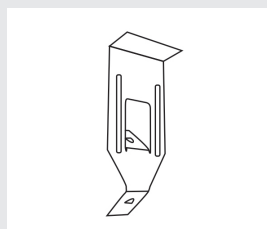
Rondo 2534 Suspension Clip



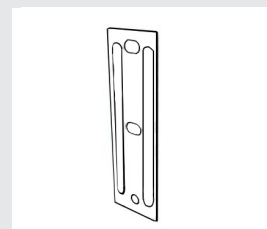
Rondo 127 Top Cross Rail



Rondo 121 Suspension Rod



Rondo 547 Adjustable Suspension Hanger

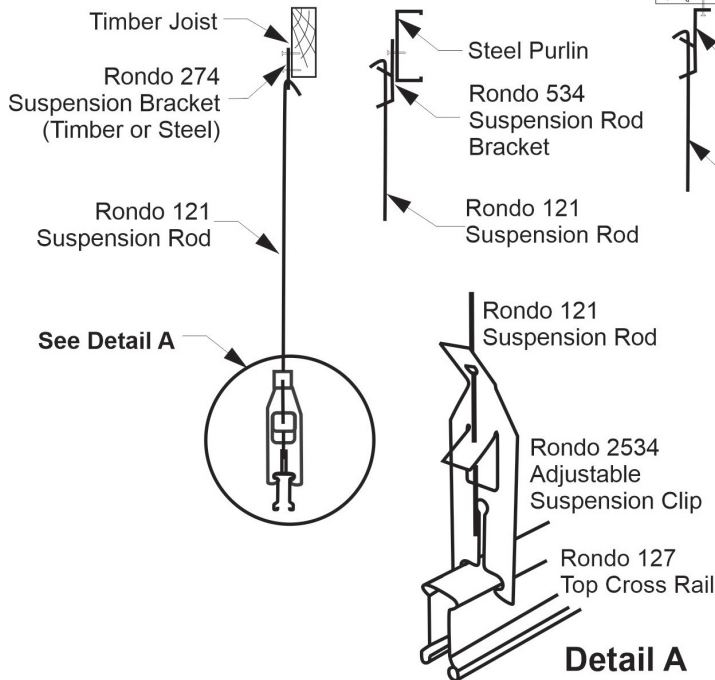


Rondo 274 Suspension Bracket

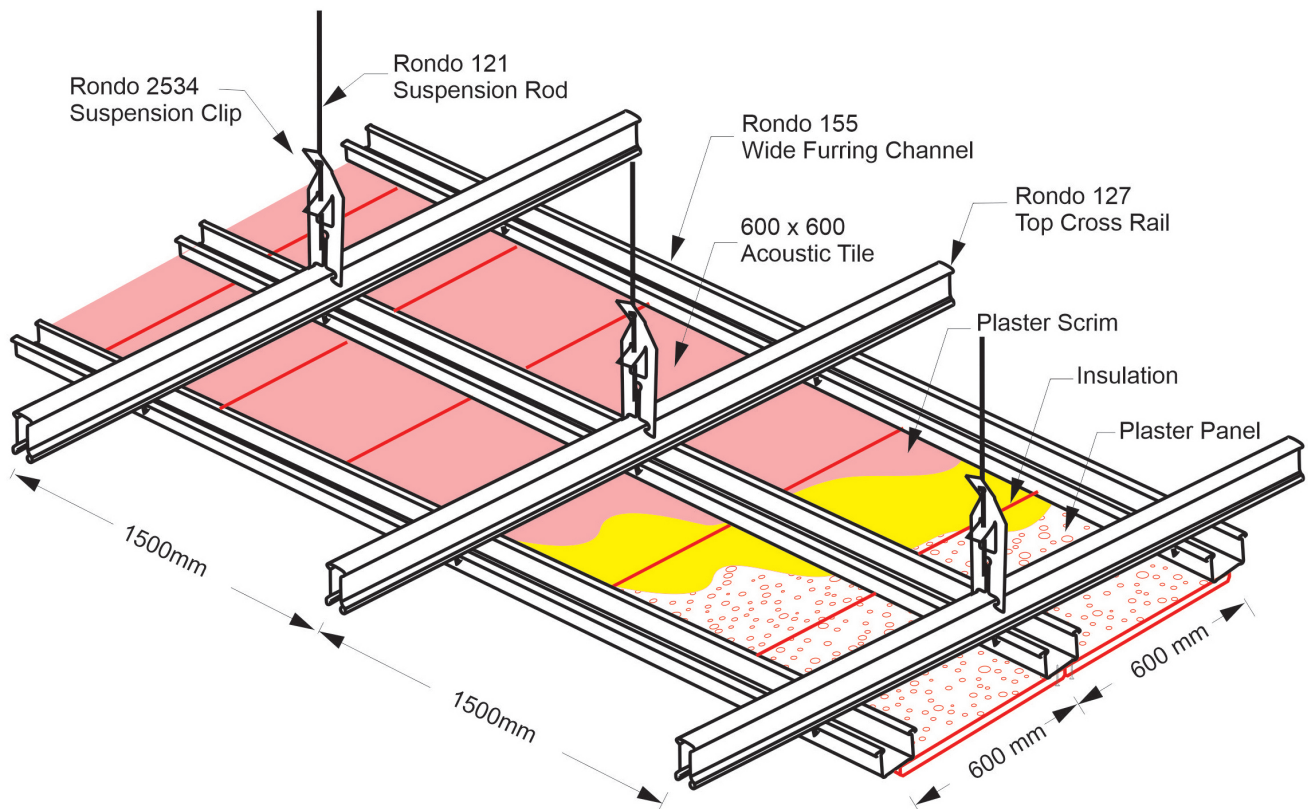
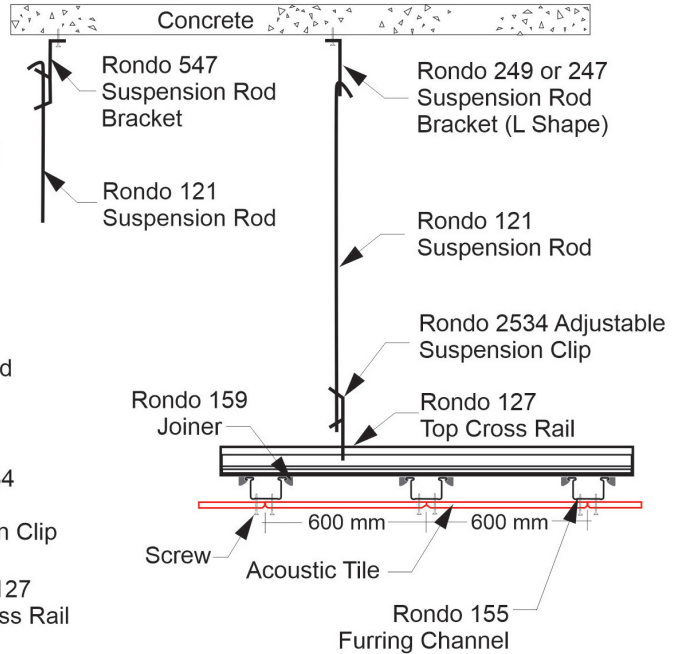


# CONCEALED SUSPENDED CEILING INSTALLATION

## Direct Fixing Clip Options to Timber or Steel Purlins



## Direct Fixing Clip Options to Concrete





## TESTING

Plaster Acoustic Products have been tested for **NRC** in accordance with ASTM-C423-90A at CSIRO Melbourne, Australia with NATA accreditation.

Plaster Products tested for **Room to Room CAC** have been tested in accordance with ASTM E1414 / E 1414M - 11A at Acoustic Laboratories Australia Pty Ltd, Perth, Western Australia.

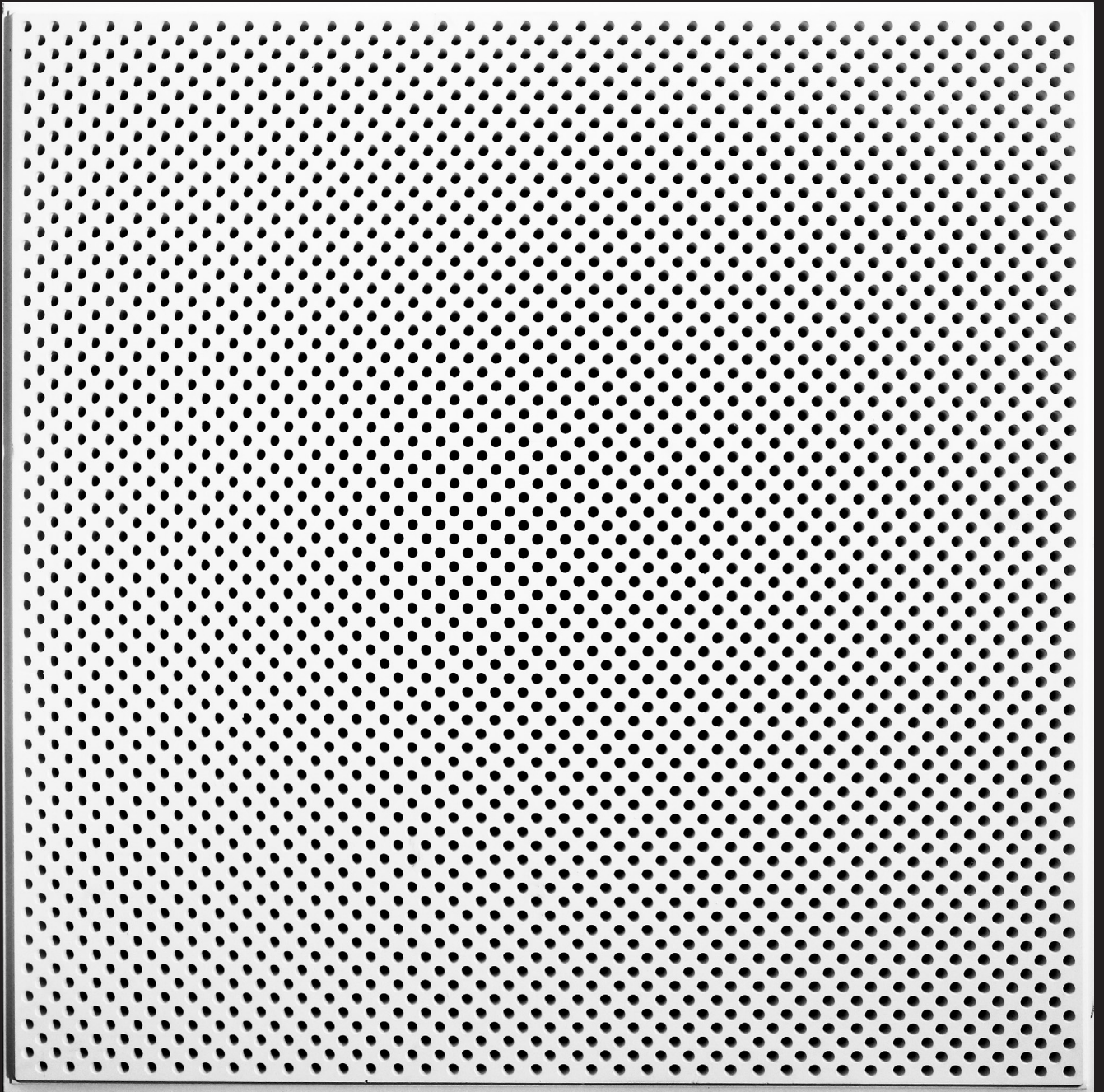
Plaster Products tested for **Steady - State Thermal Transmission** properties by means of the Heat Flow Apparatus have been product tested in Melbourne, Australia at AWTa Product Testing. (ASTM-C518) 2010

Plaster Products tested for **Heat + Smoke** release have been tested in accordance with AS/NZS 3837 - 1998 and ISO 5660.1- 2002 (Cone Colorimeter Method) at AWTa Product Testing Melbourne, Australia.



# TEST RESULTS

EcoCheck







# CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies  
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:  
**AC287-14-1**

**Client:** Bailey Interiors Pty Ltd  
83-85 Boundary Road, Mortdale, NSW 2223

## Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: Acoustics—Measurement of sound absorption in a reverberation room

AS ISO 11654-2002 [R2016] (ISO 11654:1997): Acoustics—Rating of sound absorption—Materials and systems

**Test Specimen** [Specimen area: 3.6 x 3.0 m (10.8 m<sup>2</sup>), Test configuration: Type E-200]

**Description:** • Bailey "EcoCheck" ceiling tiles, • drop-in type (600 mm ceiling grid),  
• with integral glass fibre batts (batts open to ceiling cavity at rear)

### Tile Details<sup>3</sup>

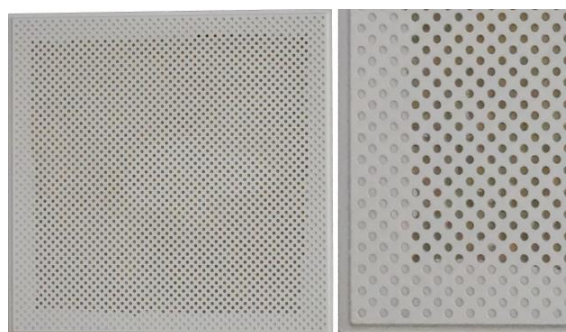
- Perforated moulded plaster ceiling tiles, nominal size 588 x 588 mm (x 30 mm thick) designed to drop into a standard 600 mm suspended ceiling grid.
- Manufactured with an integral glass fibre batt (Bradford Supertel, ≈42 kg/m<sup>3</sup>, 20 mm thick) behind the perforated face, constrained around the perimeter at the rear with plaster skim-coat covering the outer 60 mm of the batt (approx).
- Perforated with a regular pattern of 6.5 mm dia holes (2888 count); the holes near the edges being closed at the rear, the remaining holes opening into the glass fibre batt behind.
- Open area percentage<sup>4</sup> (estimated): 21.3% (only holes open front and back); 26.6% (all holes)

### Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m<sup>2</sup>, built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl 6.2.1.2). Two modules (each 100 mm deep) were stacked to create the E-200 enclosure.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the tiles with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system, then a full grid of main and cross tees was placed on top to cover the gaps between the tiles, matching a normal ceiling installation.
- All relevant joints in the installation were taped to close off any gaps – ie the junctions of the enclosure modules to each other, to the floor, and to the tile array.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

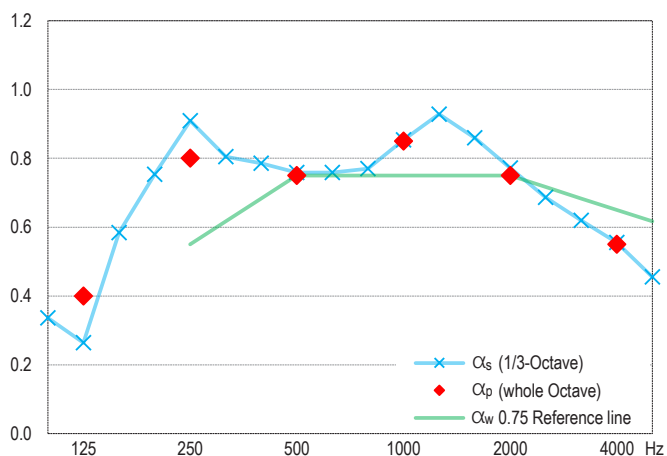
## Measurement Details & Results

Freq Hz	Absorption coefficients			Reverberation times, T <sub>60</sub> (sec)	
	α <sub>s</sub>	α <sub>p</sub>	95% Conf (δ)	Empty room	with Specimen
100	0.34		0.06	5.16	3.28
125	0.26	0.40	0.07	5.98	3.93
160	0.58		0.10	6.36	2.86
200	0.75		0.10	5.76	2.37
250	0.91	0.80	0.08	4.82	1.97
315	0.80		0.06	5.87	2.30
400	0.79		0.05	5.89	2.33
500	0.76	0.75	0.06	5.57	2.33
630	0.76		0.04	5.30	2.28
800	0.77		0.05	5.12	2.23
1000	0.85	0.85	0.04	4.86	2.05
1250	0.93		0.03	4.34	1.86
1600	0.86		0.04	3.88	1.85
2000	0.77	0.75	0.04	3.50	1.86
2500	0.69		0.03	3.10	1.83
3150	0.62		0.03	2.72	1.76
4000	0.56	0.55	0.04	2.20	1.59
5000	0.46		0.04	1.75	1.41

### Performance Indices<sup>1,2</sup>

α<sub>w</sub> = 0.75 (L)  
SAA = 0.80  
NRC = 0.80

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



### Measurement Conditions

	Empty room	with Test Specimen
Date of measurement:	2 Jun 2021	2 Jun 2021
Temperature & humidity:	17 °C, 49 % R.H.	17 °C, 51 % R.H.
Atmospheric pressure:	1006 mBar	1004 mBar

## Notes, Deviations etc

- Shape indicators (L, M, and H), if any, following the α<sub>w</sub> index, indicate α<sub>p</sub> values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
- SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

- Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
- Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

## Issuing Authority

Signed:

*David Truett*

Date:

David Truett  
25 June 2021

## Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354  
Noise source: • Room populated with three Norsonic NOR276 dodecahedron loudspeakers, driven in turn by a Norsonic NOR280 power amplifier.  
Calibration: • Analyser: July 2018 (NATA cal)

## Laboratory Construction

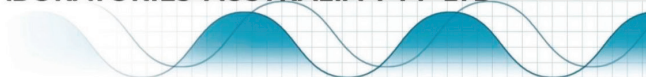
Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m<sup>3</sup> total room volume  
• approx 215 m<sup>2</sup> surface area excluding diffusers  
Diffusers: • 20 stationary diffusers, approx 40 m<sup>2</sup> total surface area  
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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## ACOUSTIC LABORATORIES AUSTRALIA PTY LTD



# AIRBORNE SOUND ATTENUATION BETWEEN ROOMS SHARING COMMON CEILING PLENUM

Unit 3/2 Hardy Street  
South Perth 6151  
Tel: 9474 4477  
Fax: 9474 5977

**ALA Test No.:** 16-095-4  
**Client:** Australian Plaster Acoustics  
**Specimen:** Ecocheck tegular edge  
**Detail:** 600 x 600 Plaster Acoustic Tile

**Description of Specimen:**

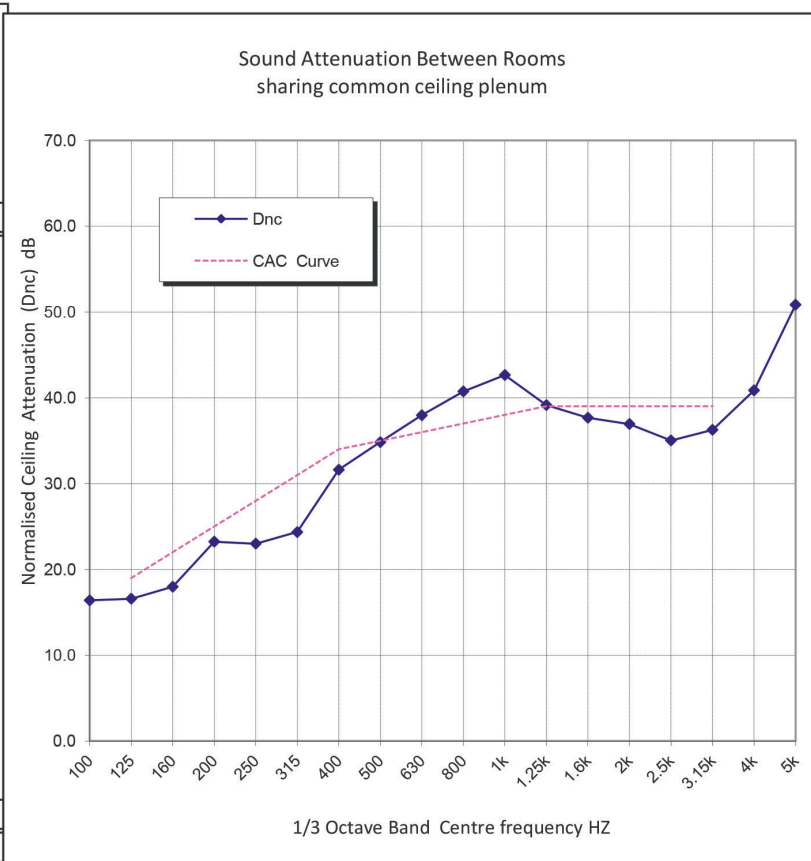
Ecocheck Tile, Tegular Edge 600 x 600 X 28mm Plaster Acoustic Tile  
Nominal open area 22.7%  
25mm glasswool insulation @ 32 kg/m<sup>3</sup>; compressed to 20mm  
Thin 2mm plaster skim coat over insulation to seal tile  
Nominal weight per tile 4.35 kg  
Lay in Tee Bar grid, Rondo Duo 1 & 2

**Meas. Date:** 10-Aug-16

Tested in accordance with  
ASTM E1414 / E1414M - 11a

**CEILING ATTENUATION CLASS****CAC 35**

Centre Frequency	Dnc	CAC Curve	Deficiencies
Hz	dB	dB	dB
100	16.4		
125	16.6	19	2.4
160	18.0	22	4.0
200	23.2	25	1.8
250	23.0	28	5.0
315	24.3	31	6.7
400	31.6	34	2.4
500	34.8	35	0.2
630	38.0	36	
800	40.7	37	
1k	42.7	38	
1.25k	39.1	39	
1.6k	37.7	39	1.3
2k	36.9	39	2.1
2.5k	35.0	39	4.0
3.15k	36.3	39	2.7
4k	40.9	39	
5k	50.8		
Total			
CAC	35		32.5



Signatory:  
Tester: N Gabriels B.Arch, FAAS

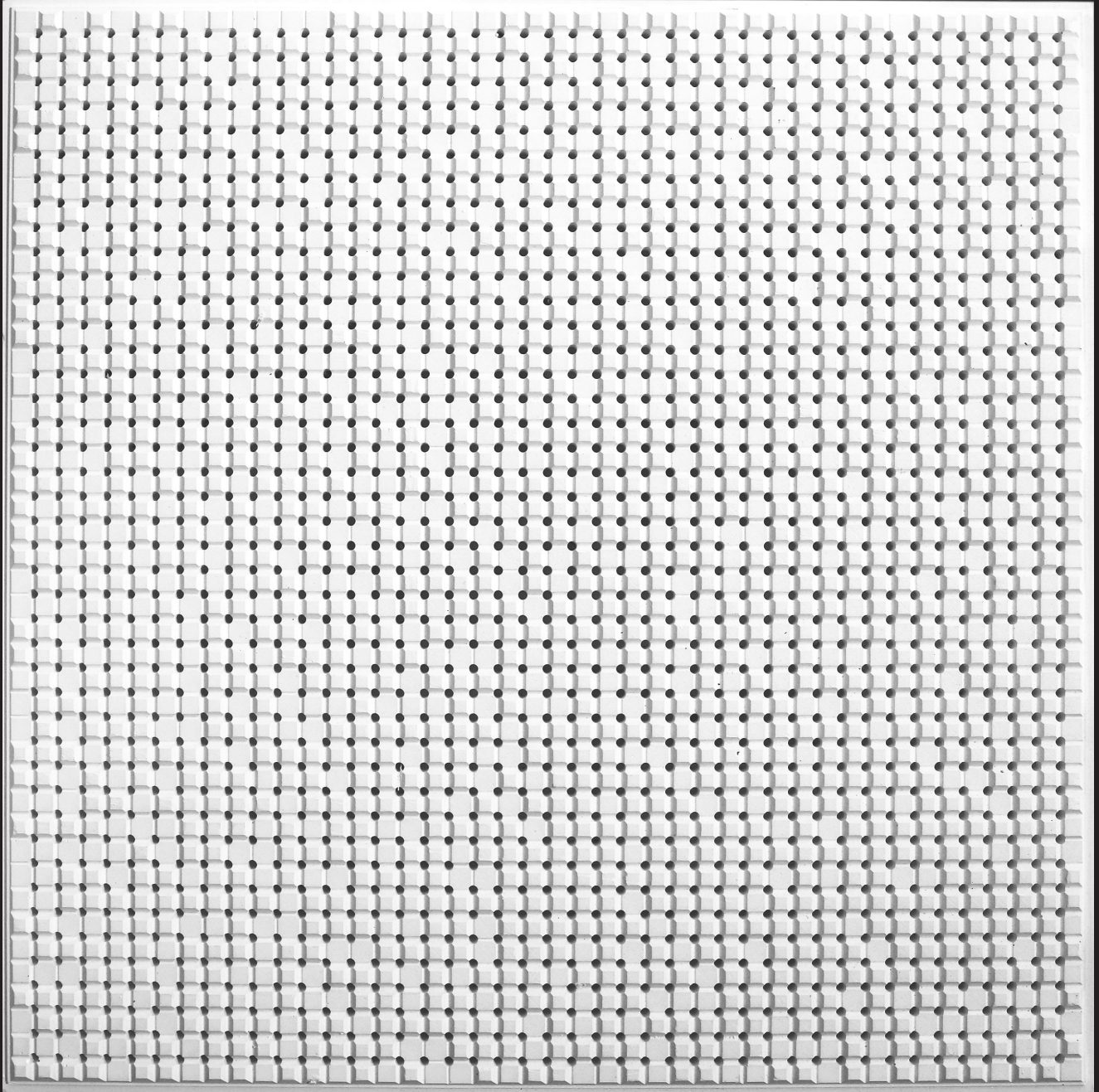
Date: 12-Aug-16

Checked: K Hearne B.Arch, MAAS



# TEST RESULTS

SHADEX







# CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies  
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:  
**AC287-06-1**

**Client:** Bailey Interiors Pty Ltd  
83-85 Boundary Road, Mortdale, NSW 2223

## Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics—Measurement of sound absorption in a reverberation room*  
AS ISO 11654-2002 [R2016] [ISO 11654:1997]: *Acoustics—Rating of sound absorption—Materials and systems*

## Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m<sup>2</sup>)]

**Description:** • Bailey "Shadex" (original design) drop-in ceiling tiles, • in 600 mm grid,  
• with integral glass fibre batts, exposed at rear to the cavity airspace (Type E-200)

### Tile Details<sup>3</sup>

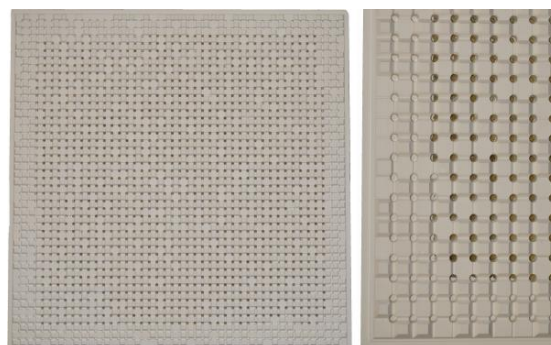
- Moulded plaster ceiling tiles designed to drop into a standard 600 mm suspended ceiling grid.
- Perforated with a regular pattern of 1849 circular holes (43 x 43 array), of which 2 lines around the perimeter were not open at the rear, and the remainder (39 x 39) opened into the glass fibre batt behind. Hole size was approx 5 mm at the face, tapering to 4.5 mm at the rear, positioned at approx 13 mm spacing.
- Decorative effect of perforations was supplemented by additional moulding details (grooves in the tile face between the perforations, and varying height of facets in between as per photo).
- Open area percentage<sup>4</sup> (estimated): 10.1 % (based on mouth area of all 1849 holes); 6.7 % (based on throat area at rear of holes, of only those holes opening into the fibre batt behind).
- Each tile was fitted with a semi rigid high-density CSR Bradford glass fibre batt, 500 x 500 x 20 mm (approx 42 kg/m<sup>3</sup>); installed during production of the tile, fixed in place by way of plaster skim-coat around the perimeter of the batt; the majority of the batt remaining open and exposed to the cavity.

### Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m<sup>2</sup>, built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 d6.2.1.2). The enclosure consisted of two 100 mm deep modules stacked to create the E-200 enclosure. The junctions of the enclosure modules to each other, to the floor, and to the tile array were all taped.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the tiles with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system, then a full grid of main and cross tees was placed on top to cover the gaps between the tiles, matching a normal ceiling installation.
- Specimen installation was carried out by laboratory staff.



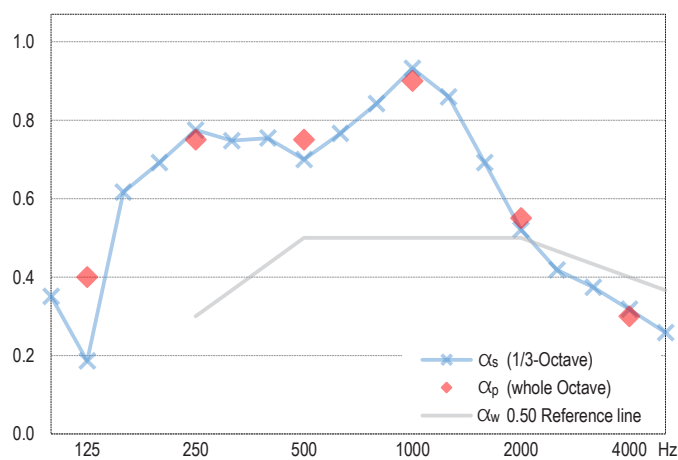
Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details - Left: whole tile, Right: close-up view

## Measurement Details & Results

Freq Hz	Absorption coefficients			Reverberation times, T <sub>60</sub> (sec)	
	α <sub>s</sub>	α <sub>p</sub>	95% Conf (δ)	Empty room	with Specimen
100	0.35		0.08	5.47	3.34
125	0.19	0.40	0.05	5.90	4.32
160	0.62		0.10	6.12	2.71
200	0.69		0.07	5.61	2.45
250	0.77	0.75	0.06	4.82	2.15
315	0.75		0.04	5.68	2.35
400	0.75		0.04	5.68	2.34
500	0.70	0.75	0.04	5.27	2.37
630	0.77		0.04	5.10	2.22
800	0.84		0.04	4.86	2.06
1000	0.93	0.90	0.05	4.71	1.91
1250	0.86		0.04	4.32	1.93
1600	0.69		0.04	3.85	2.04
2000	0.52	0.55	0.03	3.49	2.18
2500	0.42		0.02	3.12	2.18
3150	0.37		0.03	2.89	2.13
4000	0.32	0.30	0.02	2.44	1.95
5000	0.26		0.04	2.01	1.73



### Performance Indices<sup>1,2</sup>

α<sub>w</sub> = 0.50 (LM)  
SAA = 0.72  
NRC = 0.75

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.

### Measurement Conditions

	Empty room	with Test Specimen
Date of measurement:	12 Mar 2021	12 Mar 2021
Temperature & humidity:	23 °C, 58 % R.H.	23 °C, 60 % R.H.
Atmospheric pressure:	1000 mBar	1001 mBar

## Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α<sub>w</sub> index, indicate α<sub>p</sub> values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

## Issuing Authority

Signed:   
Date: 17 March 2021

## Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354  
Noise source: • Room populated with three dodecahedron loudspeakers; (2 x Norsonic NOR276 & 1 x B&K 4296), driven in turn by a Norsonic NOR280 power amplifier.  
Calibration: • Analyser: July 2018 (NATA cal)

## Laboratory Construction

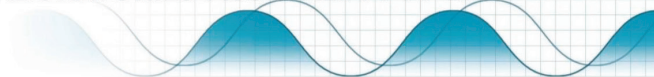
Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m<sup>3</sup> total room volume  
• approx 215 m<sup>2</sup> surface area excluding diffusers  
Diffusers: • 20 stationary diffusers, approx 40 m<sup>2</sup> total surface area  
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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## ACOUSTIC LABORATORIES AUSTRALIA PTY LTD



# AIRBORNE SOUND ATTENUATION BETWEEN ROOMS SHARING COMMON CEILING PLENUM

Unit 3/2 Hardy Street  
South Perth 6151  
Tel: 9474 4477  
Fax: 9474 5977

**ALA Test No.:** 16-091-2  
**Client:** Australian Plaster Acoustics  
**Specimen:** Shadex tegular edge  
**Detail:** 600 x 600 Plaster Acoustic Tile

**Description of Specimen:**

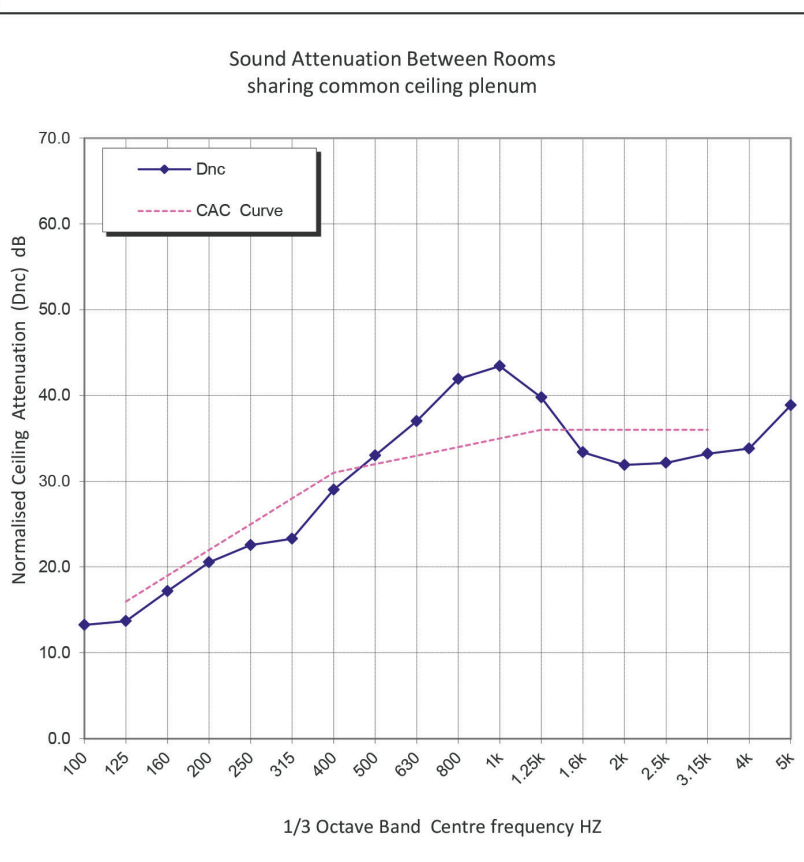
Shadex Tile, Tegular Edge 600 x 600 28mm thick Plaster Acoustic Tile  
Nominal open area 15%  
25mm glasswool insulation @ 32 kg/m<sup>3</sup>; compressed to 20mm  
Thin 2mm plaster skim coat over insulation to seal tile  
Weight per tile 4.5 Kg  
Lay in Tee Bar grid

**Meas. Date:** 13-Apr-16

Tested in accordance with  
ASTM E1414 / E1414M - 11a

**CEILING ATTENUATION CLASS****CAC****32**

Centre Frequency	Dnc	CAC Curve	Deficiencies
Hz	dB	dB	dB
100	13.2		
125	13.7	16	2.3
160	17.2	19	1.8
200	20.6	22	1.4
250	22.6	25	2.4
315	23.3	28	4.7
400	29.0	31	2.0
500	33.0	32	
630	37.0	33	
800	41.9	34	
1k	43.4	35	
1.25k	39.8	36	
1.6k	33.4	36	2.6
2k	31.9	36	4.1
2.5k	32.1	36	3.9
3.15k	33.2	36	2.8
4k	33.8	36	2.2
5k	38.9		
Total			
CAC	32		30.2



Signatory:  
Tester: N Gabriels B.Arch, FAAS

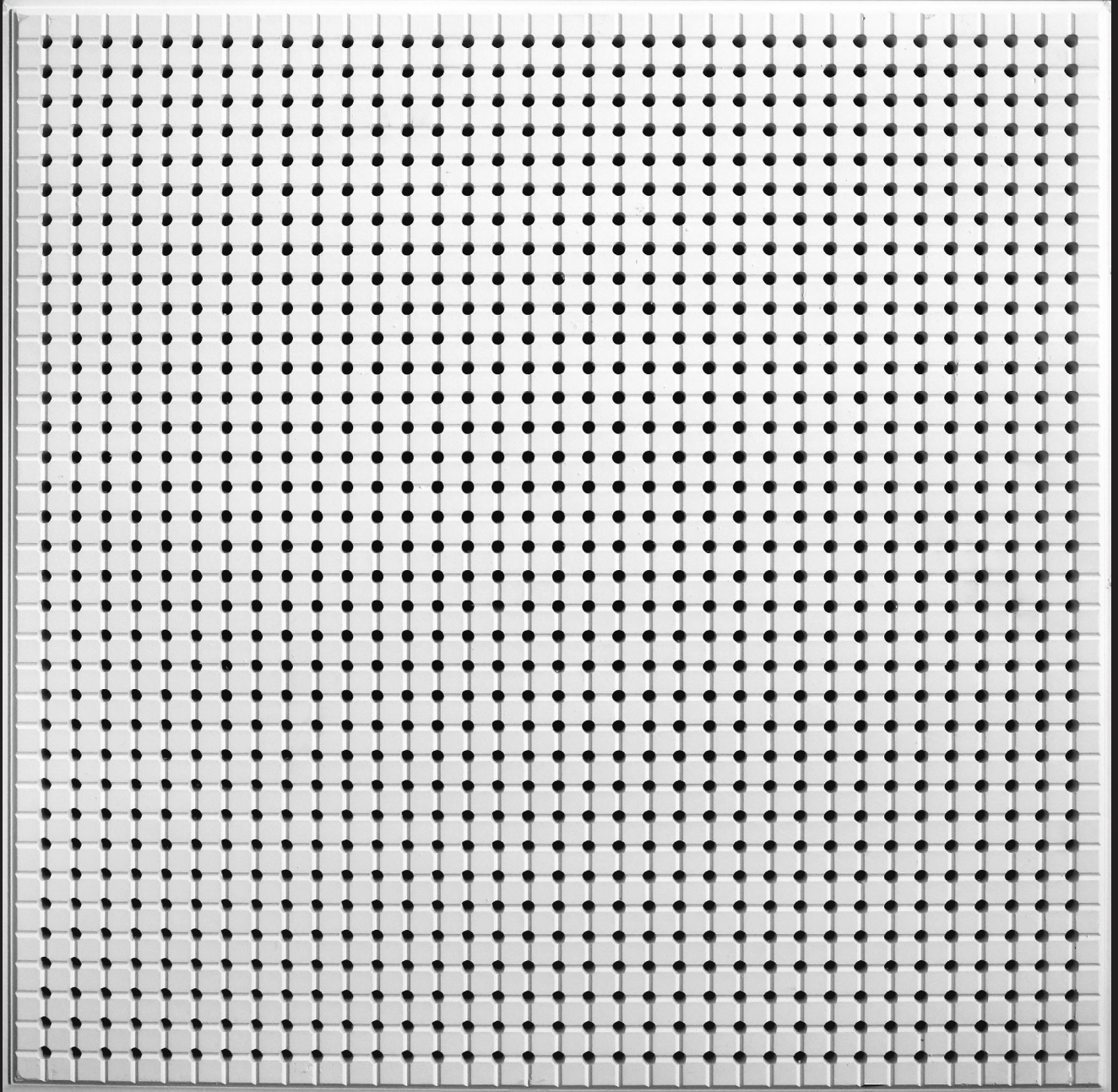
Date: 15-Apr-16

Checked: K Hearne B.Arch, MAAS



# TEST RESULTS

Hush







# CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies  
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:  
**AC287-11-1**

**Client:** Bailey Interiors Pty Ltd  
83-85 Boundary Road, Mortdale, NSW 2223

## Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*  
AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

## Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m<sup>2</sup>), Test configuration: Type E-200]  
**Description:** • Bailey "Hush" ceiling tiles, • drop-in type (600 mm ceiling grid),  
• with integral glass fibre batts (batts open to ceiling cavity at rear)

### Tile Details<sup>3</sup>

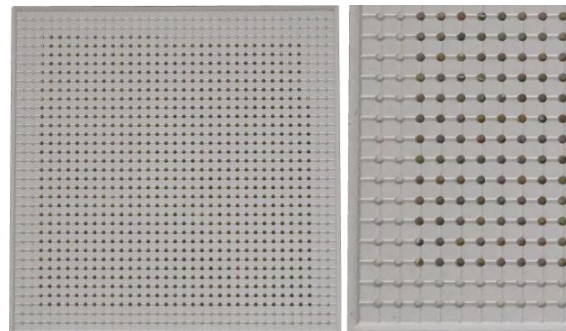
- Perforated moulded plaster ceiling tiles, approx 588 x 588 mm (x 30 mm thick) designed to drop into a standard 600 mm suspended ceiling grid.
- Manufactured with an integral glass fibre batt (Bradford Supertel,  $\approx 42 \text{ kg/m}^3$ , 20 mm thick) behind the perforated face, constrained around the perimeter at the rear with plaster skim-coat covering the outer 60 mm of the batt (approx).
- Perforated with a regular pattern of 7.0 mm dia holes (1225 count; approx 16 mm centres); the holes near the edges being closed at the rear, the remaining holes opening into the glass fibre batt behind.
- Open area percentage<sup>4</sup> (estimated): 10.5% (only holes open front and back); 13.1% (all holes).
- Decorative effect o
- f perforations supplemented by additional moulding details (grooves between the perforations).

### Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m<sup>2</sup>, built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl 6.2.1.2). Two modules (each 100 mm deep) were stacked to create the E-200 enclosure.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the tiles with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system, then a full grid of main and cross tees was placed on top to cover the gaps between the tiles, matching a normal ceiling installation.
- All relevant joints in the installation were taped to close off any gaps – ie the junctions of the enclosure modules to each other, to the floor, and to the tile array.
- Specimen installation was carried out by laboratory staff.



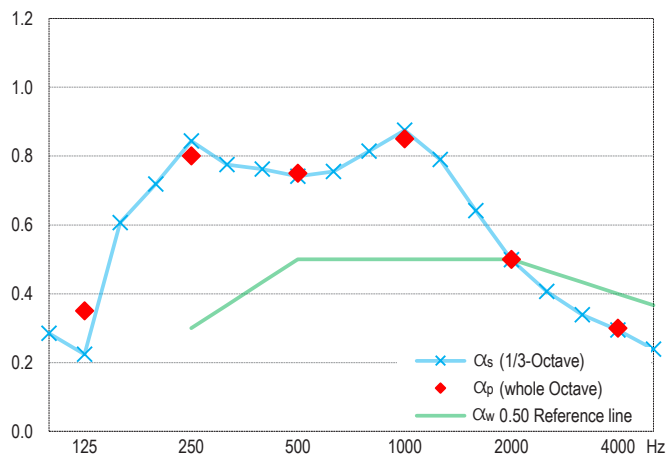
Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

## Measurement Details & Results

Freq Hz	Absorption coefficients			Reverberation times, T <sub>60</sub> (sec)	
	$\alpha_s$	$\alpha_p$	95% Conf (s)	Empty room	with Specimen
100	0.28		0.06	5.02	3.42
125	0.22	0.35	0.06	5.81	4.07
160	0.61		0.08	6.30	2.79
200	0.72		0.08	5.79	2.44
250	0.84	0.80	0.12	4.84	2.06
315	0.78		0.05	5.94	2.36
400	0.76		0.04	5.79	2.36
500	0.74	0.75	0.05	5.55	2.36
630	0.76		0.03	5.27	2.28
800	0.81		0.04	5.09	2.15
1000	0.88	0.85	0.05	4.84	2.02
1250	0.79		0.04	4.36	2.04
1600	0.64		0.03	3.86	2.13
2000	0.50	0.50	0.03	3.48	2.22
2500	0.41		0.03	3.08	2.20
3150	0.34		0.03	2.68	2.09
4000	0.29	0.30	0.04	2.18	1.83
5000	0.24		0.04	1.72	1.55



### Performance Indices<sup>1,2</sup>

$\alpha_w = 0.50$  (LM)  
SAA = 0.72  
NRC = 0.75

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.

Measurement Conditions	
	Empty room
Date of measurement:	1 Jun 2021
Temperature & humidity:	17 °C, 48 % R.H.
Atmospheric pressure:	1009 mBar
	with Test Specimen
Date of measurement:	1 Jun 2021
Temperature & humidity:	17 °C, 52 % R.H.
Atmospheric pressure:	1007 mBar

## Notes, Deviations etc

- Shape indicators (L, M, and H), if any, following the  $\alpha_w$  index, indicate  $\alpha_p$  values above the reference contour by  $\geq 0.25$  in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
- SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

- Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
- Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

## Issuing Authority

Signed:   
Date: David Truett  
25 June 2021

## Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354  
Noise source: • Room populated with three Norsonic NOR276 dodecahedron loudspeakers, driven in turn by a Norsonic NOR280 power amplifier.  
Calibration: • Analyser: July 2018 (NATA cal)

## Laboratory Construction

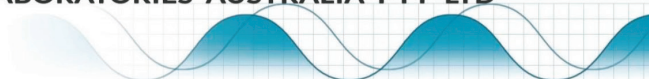
Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m<sup>3</sup> total room volume  
• approx 215 m<sup>2</sup> surface area excluding diffusers  
Diffusers: • 20 stationary diffusers, approx 40 m<sup>2</sup> total surface area  
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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## ACOUSTIC LABORATORIES AUSTRALIA PTY LTD



# AIRBORNE SOUND ATTENUATION BETWEEN ROOMS SHARING COMMON CEILING PLENUM

Unit 3/2 Hardy Street  
South Perth 6151  
Tel: 9474 4477  
Fax: 9474 5977

**ALA Test No.:** 16-091-5  
**Client:** Australian Plaster Acoustics  
**Specimen:** Hush Tile- Tegular Edge  
**Detail:** 600 x 600 Plaster Acoustic Tile

**Description of Specimen:**

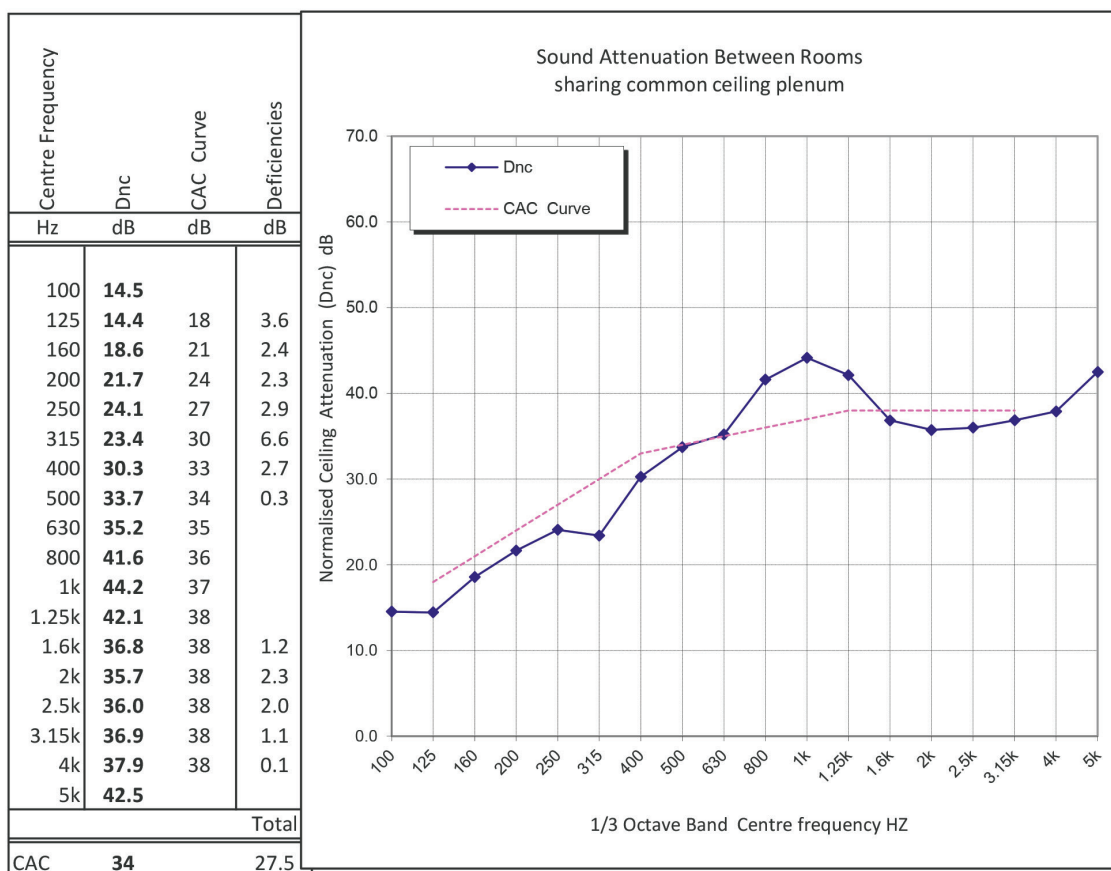
Hush Tile, Tegular Edge 600 x 600 X 28mm Plaster Acoustic Tile  
6mm perforated plaster face. Nominal open area 21.4%  
25mm glasswool insulation @ 32 kg/m3; compressed to 20mm  
Thin 2mm plaster skim coat over insulation to seal tile  
Nominal weight per tile 4.5 kg  
Lay in Tee Bar grid - Rondo Duo 1 and 2

**Meas. Date:** 14-Apr-16

Tested in accordance with  
ASTM E1414 / E1414M - 11a

**CEILING ATTENUATION CLASS**

**CAC 34**



Signatory:  
Tester: N Gabriels B.Arch, FAAS

Date: 16-Apr-16

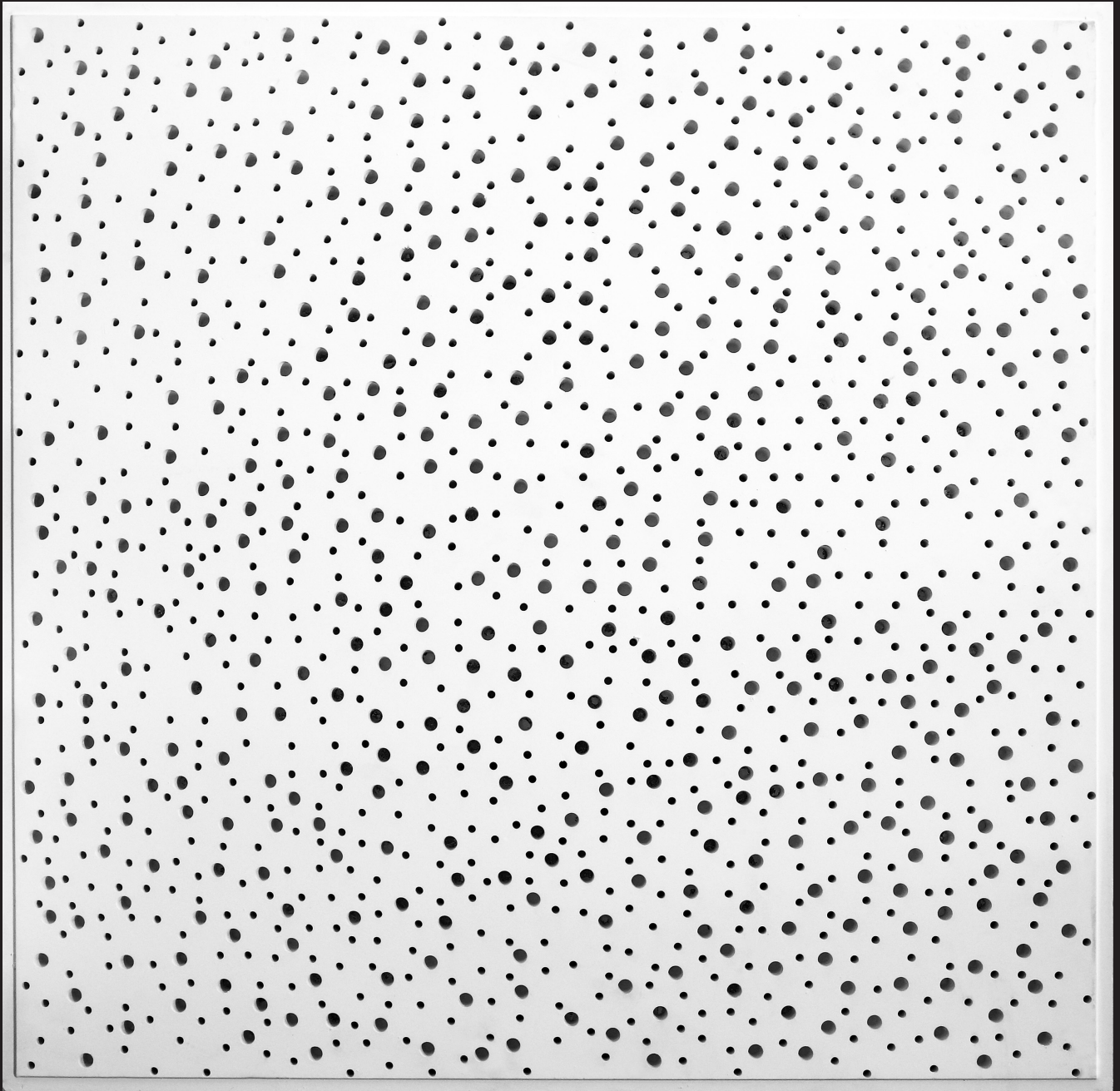
*Kingsley Hearne*

Checked: K Hearne B.Arch, MAAS



# TEST RESULTS

Random Hole







# CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies  
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:  
**AC287-10-1**

**Client:** Bailey Interiors Pty Ltd  
83-85 Boundary Road, Mortdale, NSW 2223

## Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*  
AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

**Test Specimen** [Specimen area: 3.6 x 3.0 m (10.8 m<sup>2</sup>), Test configuration: Type E-200]

**Description:** • Bailey "Random" ceiling tiles, • drop-in type (600 mm ceiling grid),  
• with integral glass fibre batts (batts open to ceiling cavity at rear)

### Tile Details<sup>3</sup>

- Perforated moulded plaster ceiling tiles, approx 588 x 588 mm (x 30 mm thick) designed to drop into a standard 600 mm suspended ceiling grid.
- Manufactured with an integral glass fibre batt (Bradford Supertel, ≈42 kg/m<sup>3</sup>, 20 mm thick) behind the perforated face, constrained around the perimeter at the rear with plaster skim-coat covering the outer 60 mm of the batt (approx).
- Perforated with a random pattern with a mixture of 6.5 and 8.0 mm dia holes (approx 880 and 440 of each size respectively); the holes near the edges being closed at the rear, the remaining holes opening into the glass fibre batt behind.
- Open area percentage<sup>4</sup> (estimated): 11.5% (only holes open front and back); 14.3% (all holes).

### Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m<sup>2</sup>, built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl 6.2.1.2). Two modules (each 100 mm deep) were stacked to create the E-200 enclosure.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the tiles with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system, then a full grid of main and cross tees was placed on top to cover the gaps between the tiles, matching a normal ceiling installation.
- All relevant joints in the installation were taped to close off any gaps – ie the junctions of the enclosure modules to each other, to the floor, and to the tile array.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

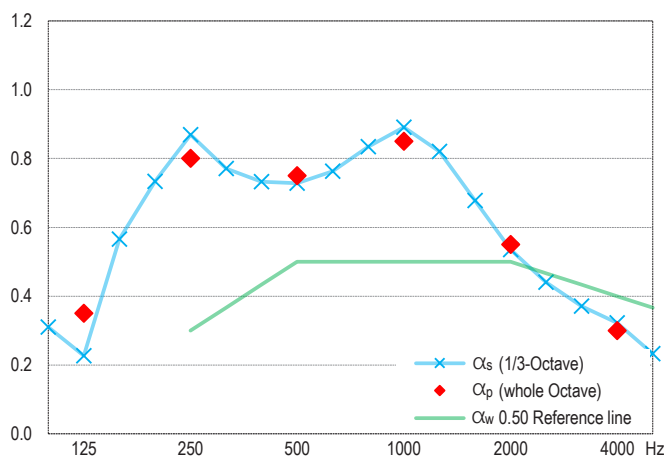
## Measurement Details & Results

Freq Hz	Absorption coefficients			Reverberation times, T <sub>60</sub> (sec)	
	α <sub>s</sub>	α <sub>p</sub>	95% Conf (δ)	Empty room	with Specimen
100	0.31		0.06	5.02	3.32
125	0.23	0.35	0.06	5.81	4.05
160	0.57		0.09	6.30	2.90
200	0.73		0.09	5.79	2.41
250	0.87	0.80	0.09	4.84	2.03
315	0.77		0.06	5.94	2.37
400	0.73		0.04	5.79	2.41
500	0.73	0.75	0.06	5.55	2.38
630	0.76		0.02	5.27	2.27
800	0.83		0.04	5.09	2.12
1000	0.89	0.85	0.06	4.84	2.00
1250	0.82		0.04	4.36	2.00
1600	0.68		0.03	3.86	2.07
2000	0.54	0.55	0.03	3.48	2.16
2500	0.44		0.03	3.08	2.15
3150	0.37		0.03	2.68	2.04
4000	0.32	0.30	0.03	2.18	1.80
5000	0.23		0.03	1.72	1.55

### Performance Indices<sup>1,2</sup>

α<sub>w</sub> = 0.50 (LM)  
SAA = 0.73  
NRC = 0.75

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



### Measurement Conditions

	Empty room	with Test Specimen
Date of measurement:	1 Jun 2021	1 Jun 2021
Temperature & humidity:	17 °C, 48 % R.H.	17 °C, 51 % R.H.
Atmospheric pressure:	1009 mBar	1007 mBar

## Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α<sub>w</sub> index, indicate α<sub>p</sub> values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

## Issuing Authority

Signed:

*David Truett*

Date:

25 June 2021

## Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354  
Noise source: • Room populated with three Norsonic NOR276 dodecahedron loudspeakers, driven in turn by a Norsonic NOR280 power amplifier.  
Calibration: • Analyser: July 2018 (NATA cal)

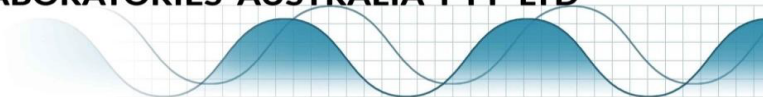
## Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m<sup>3</sup> total room volume • approx 215 m<sup>2</sup> surface area excluding diffusers  
Diffusers: • 20 stationary diffusers, approx 40 m<sup>2</sup> total surface area  
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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# AIRBORNE SOUND ATTENUATION BETWEEN ROOMS SHARING COMMON CEILING PLENUM

Unit 3/2 Hardy Street  
South Perth 6151  
Tel: 9474 4477  
Fax: 9474 5977

ALA Test No.: 16-095-1  
Client: Australian Plaster Acoustics  
Specimen: Random Tile  
Detail: 600 x 600 Plaster Acoustic Tile

## Description of Specimen:

Random Tile, Tegular Edge 600 x 600 X 28mm thick Plaster Acoustic Tile  
Nominal open area 10.5%  
25mm polyester insulation @ 32 kg/m<sup>3</sup>; compressed to 20mm  
Thin 2mm plaster skim coat over insulation to seal tile  
Nominal weight per tile 4.5 kg  
Lay in Tee Bar grid

Meas. Date: 09-Aug-16

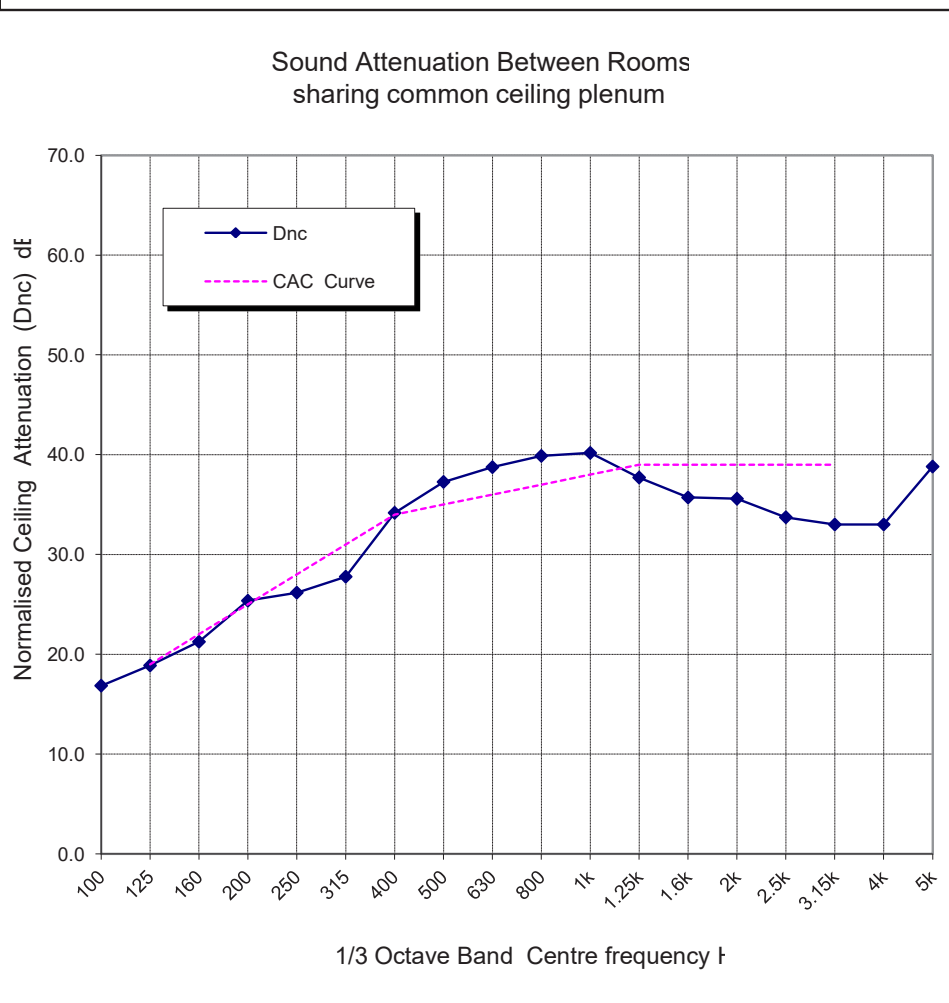
Tested in accordance with  
ASTM E1414 / E1414M - 1

## CEILING ATTENUATION CLASS

CAC

35

Centre Frequency	Dnc	CAC Curve	Deficiencies
Hz	dB	dB	dB
100	16.9		
125	18.9	19	0.1
160	21.3	22	0.7
200	25.4	25	
250	26.2	28	1.8
315	27.8	31	3.2
400	34.2	34	
500	37.3	35	
630	38.7	36	
800	39.9	37	
1k	40.2	38	
1.25k	37.7	39	1.3
1.6k	35.7	39	3.3
2k	35.6	39	3.4
2.5k	33.7	39	5.3
3.15k	33.0	39	6.0
4k	33.0	39	6.0
5k	38.8		
Total			
CAC	35		31.2



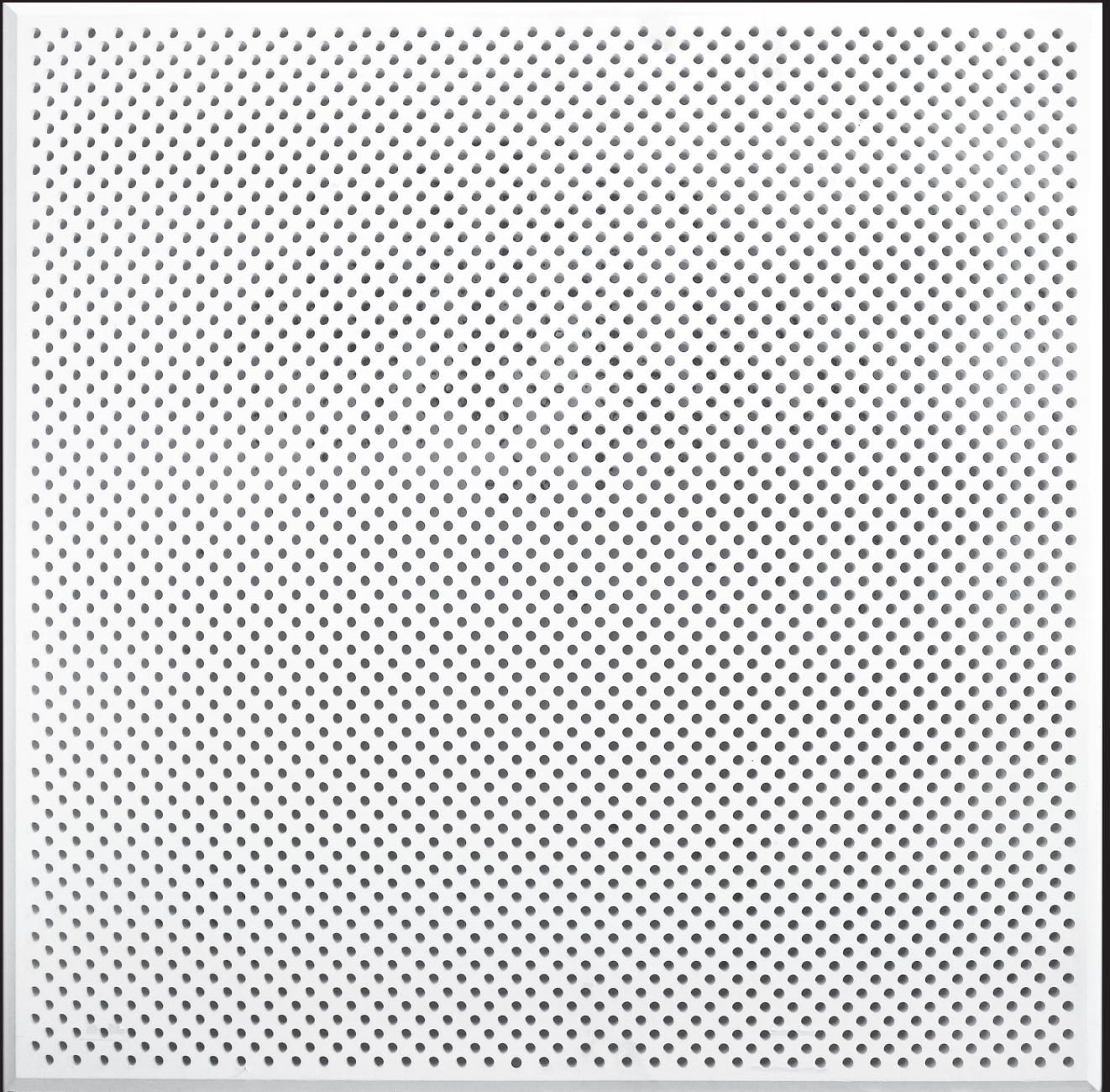
*Signature*

*Kinasken Heavne*



# TEST RESULTS

EcoCheck Direct Fix





# CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies  
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:  
**AC287-08-1**

**Client:** Bailey Interiors Pty Ltd  
83-85 Boundary Road, Mortdale, NSW 2223

## Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: Acoustics-Measurement of sound absorption in a reverberation room  
AS ISO 11654-2002 [R2016] (ISO 11654:1997): Acoustics-Rating of sound absorption-Materials and systems

## Test Specimen [Specimen area: 3.6 x 3.0 m (10.8 m<sup>2</sup>), Test configuration: Type E-200]

**Description:** • Bailey "EcoCheck" ceiling tiles, • direct-fix type,  
• with integral glass fibre batts (batts open to ceiling cavity at rear)

### Tile Details<sup>3</sup>

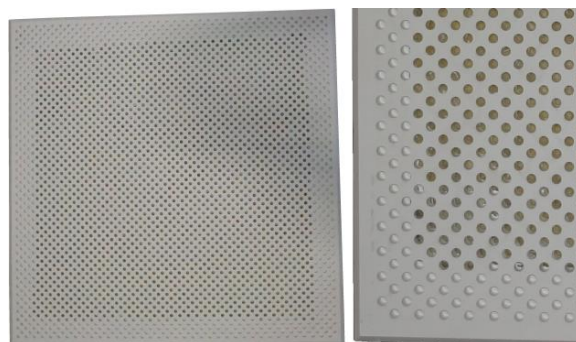
- Perforated moulded plaster ceiling tiles, nominal size 600 x 600 mm (x 30 mm thick) designed to be nail/screw fixed to overhead ceiling battens.
- Manufactured with an integral glass fibre batt (Bradford Supertel, ≈42 kg/m<sup>3</sup>, 20 mm thick) behind the perforated face, constrained around the perimeter at the rear with plaster skim-coat covering the outer 60 mm of the batt (approx).
- Perforated with a regular pattern of 6.5 mm dia holes (2888 count); the holes near the edges being closed at the rear, the remaining holes opening into the glass fibre batt behind.
- Open area percentage<sup>4</sup> (estimated): 21.3% (only holes open front and back); 26.6% (all holes).

### Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m<sup>2</sup>, built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl 6.2.1.2). Two modules (each 100 mm deep) were stacked to create the E-200 enclosure.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the tiles with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system.
- All relevant joints in the installation were taped to close off any gaps – ie the junctions of the enclosure modules to each other, to the floor, and to the tile array, and where adjacent tiles butted against each other in the installed array.
- Specimen installation was carried out by laboratory staff.



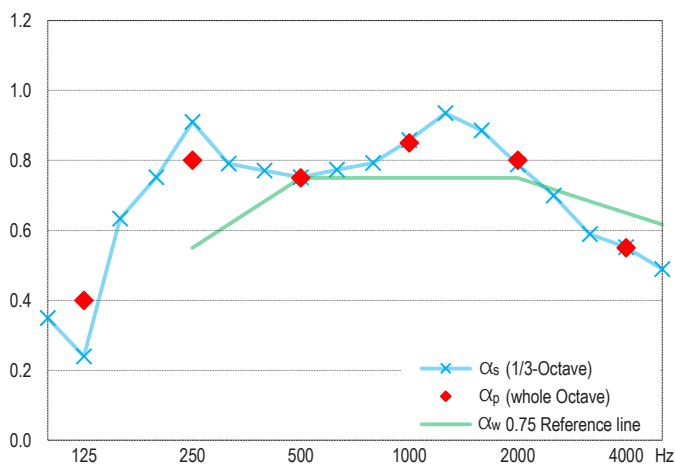
Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

## Measurement Details & Results

Freq Hz	Absorption coefficients			Reverberation times, T <sub>60</sub> (sec)	
	α <sub>s</sub>	α <sub>p</sub>	95% Conf (δ)	Empty room	with Specimen
100	0.35		0.05	5.38	3.32
125	0.24	0.40	0.06	6.05	4.08
160	0.63		0.08	6.60	2.77
200	0.75		0.12	5.89	2.39
250	0.91	0.80	0.11	4.87	1.98
315	0.79		0.06	5.92	2.32
400	0.77		0.05	5.89	2.35
500	0.75	0.75	0.05	5.64	2.35
630	0.77		0.05	5.34	2.26
800	0.79		0.05	5.14	2.19
1000	0.86	0.85	0.04	4.89	2.05
1250	0.94		0.04	4.40	1.86
1600	0.89		0.04	3.91	1.82
2000	0.79	0.80	0.04	3.58	1.85
2500	0.70		0.03	3.15	1.82
3150	0.59		0.03	2.73	1.78
4000	0.55	0.55	0.05	2.21	1.57
5000	0.49		0.05	1.78	1.37



### Performance Indices<sup>1,2</sup>

α<sub>w</sub> = 0.75 (L)  
SAA = 0.81  
NRC = 0.85

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.

**Measurement Conditions**

Empty room	with Test Specimen
Date of measurement: 1 Jun 2021	1 Jun 2021
Temperature & humidity: 16 °C, 51 % R.H.	17 °C, 48 % R.H.
Atmospheric pressure: 1008 mBar	1008 mBar

## Notes, Deviations etc

- Shape indicators (L, M, and H), if any, following the α<sub>w</sub> index, indicate α<sub>p</sub> values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
- SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

- Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
- Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

## Issuing Authority

Signed:   
Date: 25 June 2021

## Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354  
Noise source: • Room populated with three Norsonic NOR276 dodecahedron loudspeakers, driven in turn by a Norsonic NOR280 power amplifier.  
Calibration: • Analyser: July 2018 (NATA cal)

## Laboratory Construction

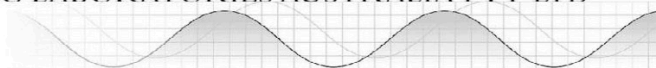
Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m<sup>3</sup> total room volume  
• approx 215 m<sup>2</sup> surface area excluding diffusers  
Diffusers: • 20 stationary diffusers, approx 40 m<sup>2</sup> total surface area  
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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## ACOUSTIC LABORATORIES AUSTRALIA PTY LTD



## Airborne Sound Attenuation between Rooms Sharing Common Ceiling Plenum

Unit 3/2 Hardy Street  
South Perth 6151  
Tel: 9474 4477  
Fax: 9474 5977

ALA Test No.: 15-086-2  
Project: Bailey Interiors  
Specimen: Echo-Check Nail Up.  
Detail: CAC Measurement

### Description of Specimen:

Echo-Check 600 x 600 X 28mm thick Plaster Acoustic Tile  
25mm glasswool insulation @ 32 kg/m3; compressed to 20mm  
Thin plaster skim coat over insulation to seal tile  
Sides of tile, screw fixed to furring chennels  
Opposite enbds of tile are lapped to control acoustic Leakage  
6mm round holes with nominal open area 8.7%  
Nominal surface density 14.4 kg/m2

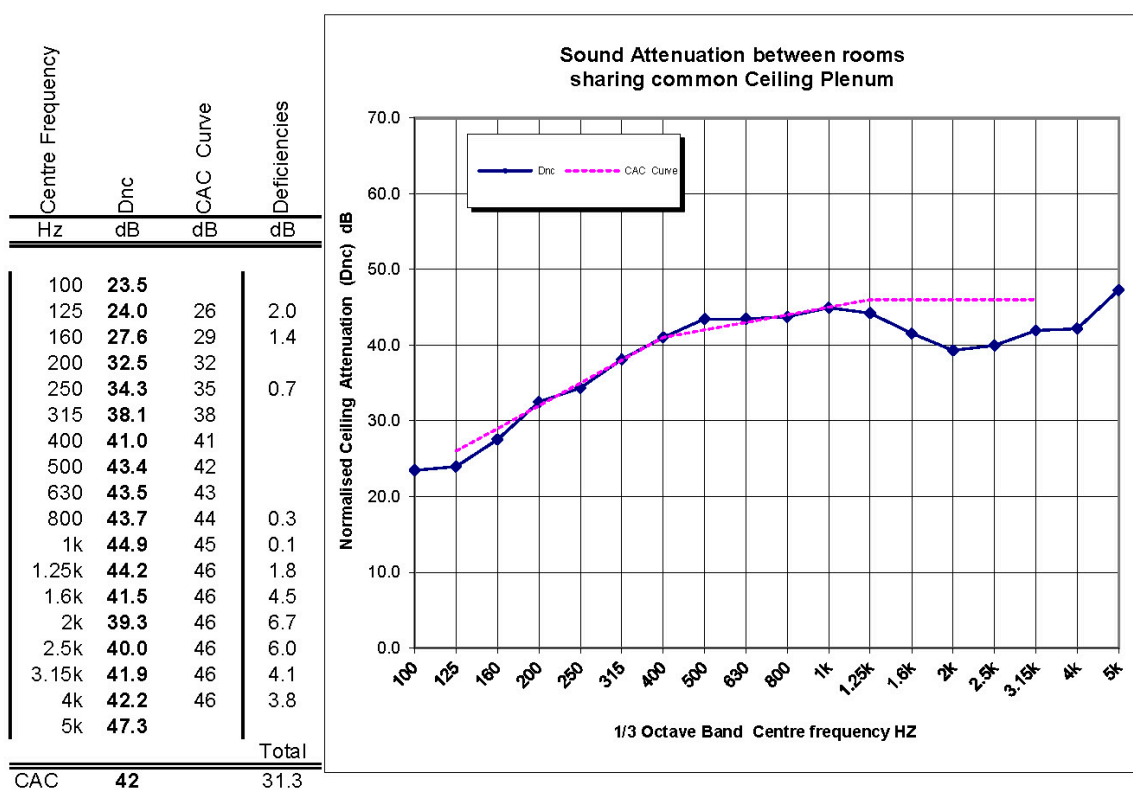
Meas. Date: 02-Apr-15

Tested in accordance with  
ASTM E1414 / E1414M - 11a

**CEILING ATTENUATION CLASS**

**CAC**

**42**



Signatory:  
Tester: N Gabriels B.Arch, FAAS

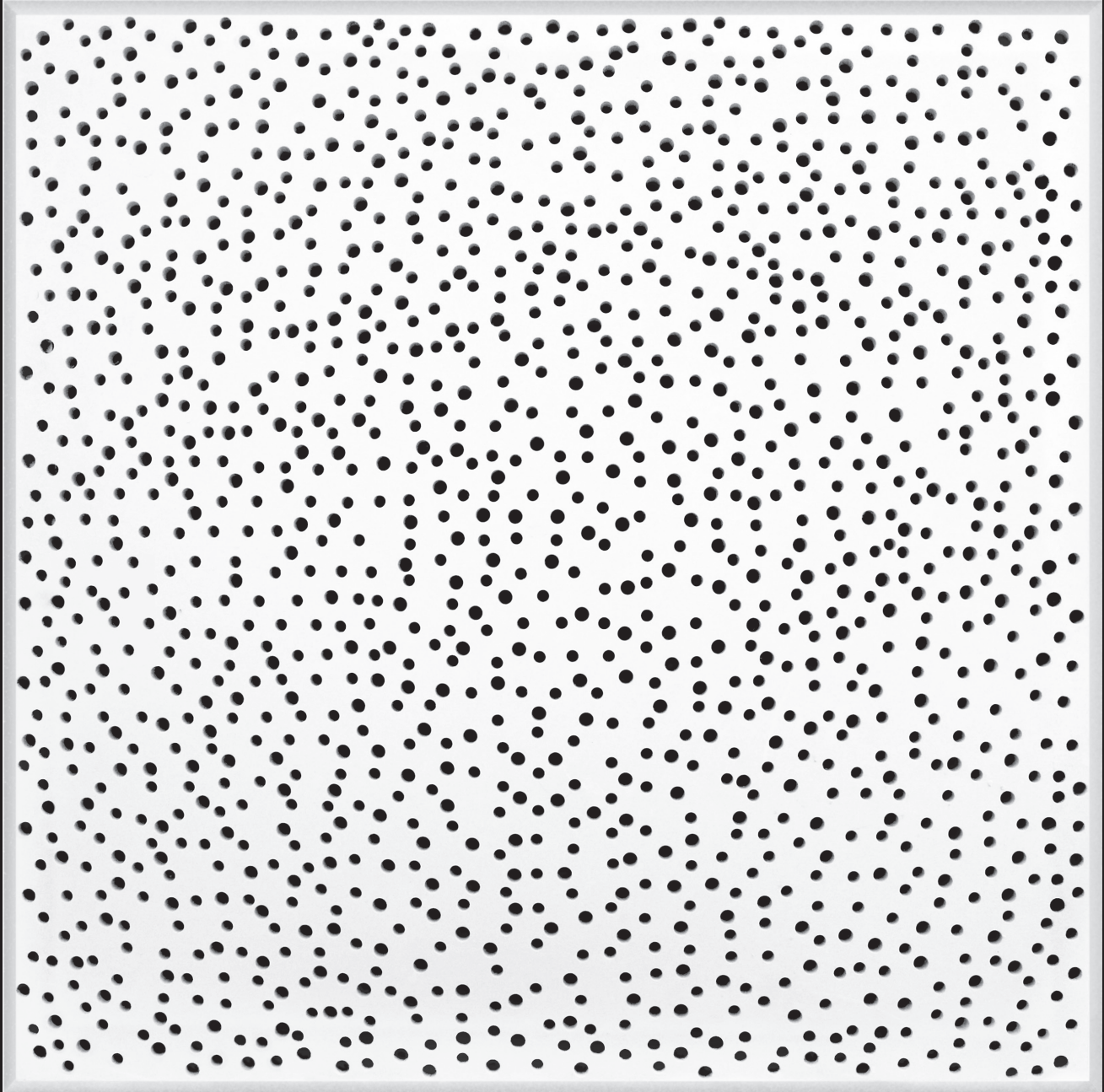
Date: 3-Apr-15

Kingsley Hearne

Checked: K Hearne B.Arch, MAAS

# TEST RESULTS

Random Direct Fix







# CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies  
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:  
**AC287-09-1**

**Client:** Bailey Interiors Pty Ltd  
83-85 Boundary Road, Mortdale, NSW 2223

## Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*  
AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

**Test Specimen** [Specimen area: 3.6 x 3.0 m (10.8 m<sup>2</sup>), Test configuration: Type E-200]

**Description:** • Bailey "Random" ceiling tiles, • direct-fix type,  
• with integral glass fibre batts (batts open to ceiling cavity at rear)

### Tile Details<sup>3</sup>

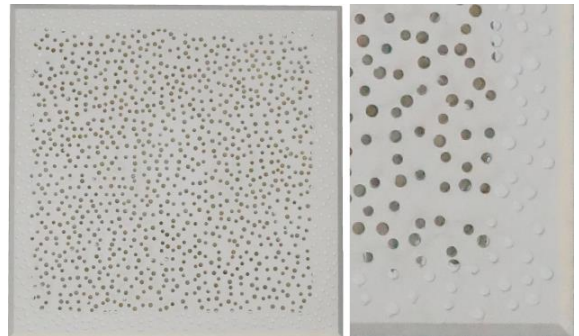
- Perforated moulded plaster ceiling tiles, nominal size 600 x 600 mm (x 30 mm thick) designed to be nail/screw fixed to overhead ceiling battens.
- Manufactured with an integral glass fibre batt (Bradford Supertel, ≈42 kg/m<sup>3</sup>, 20 mm thick) behind the perforated face, constrained around the perimeter at the rear with plaster skim-coat covering the outer 60 mm of the batt (approx).
- Perforated with a random pattern with a mixture of 6.5 and 8.0 mm dia holes (approx 915 and 475 of each size respectively); the holes near the edges being closed at the rear, the remaining holes opening into the glass fibre batt behind.
- Open area percentage<sup>4</sup> (estimated): 12.0% (only holes open front and back); 15.1% (all holes).

### Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m<sup>2</sup>, built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl 6.2.1.2). Two modules (each 100 mm deep) were stacked to create the E-200 enclosure.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the tiles with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system.
- All relevant joints in the installation were taped to close off any gaps – ie the junctions of the enclosure modules to each other, to the floor, and to the tile array, and where adjacent tiles butted against each other in the installed array.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

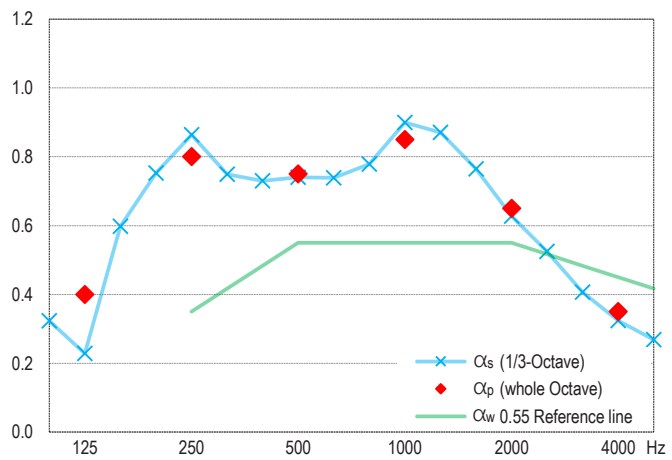
## Measurement Details & Results

Freq Hz	Absorption coefficients			Reverberation times, T <sub>60</sub> (sec)	
	α <sub>s</sub>	α <sub>p</sub>	95% Conf (δ)	Empty room	with Specimen
100	0.32		0.06	5.02	3.27
125	0.23	0.40	0.06	5.81	4.04
160	0.60		0.08	6.30	2.81
200	0.75		0.10	5.79	2.38
250	0.86	0.80	0.11	4.84	2.03
315	0.75		0.05	5.94	2.41
400	0.73		0.05	5.79	2.42
500	0.74	0.75	0.05	5.55	2.36
630	0.74		0.04	5.27	2.31
800	0.78		0.04	5.09	2.20
1000	0.90	0.85	0.03	4.84	1.99
1250	0.87		0.04	4.36	1.94
1600	0.76		0.04	3.86	1.96
2000	0.63	0.65	0.05	3.48	2.02
2500	0.52		0.03	3.08	2.02
3150	0.41		0.03	2.68	1.98
4000	0.32	0.35	0.05	2.18	1.78
5000	0.27		0.03	1.72	1.51

### Performance Indices<sup>1,2</sup>

α<sub>w</sub> = 0.55 (LM)  
SAA = 0.75  
NRC = 0.80

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



### Measurement Conditions

	Empty room	with Test Specimen
Date of measurement:	1 Jun 2021	1 Jun 2021
Temperature & humidity:	17 °C, 48 % R.H.	17 °C, 49 % R.H.
Atmospheric pressure:	1009 mBar	1008 mBar

## Notes, Deviations etc

- Shape indicators (L, M, and H), if any, following the α<sub>w</sub> index, indicate α<sub>p</sub> values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
- SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

- Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
- Open area estimates are based on 600 mm of ceiling area being 'treated' by each tile.

## Issuing Authority

Signed:

*David Truett*

Date:

David Truett  
25 June 2021

## Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354  
Noise source: • Room populated with three Norsonic NOR276 dodecahedron loudspeakers, driven in turn by a Norsonic NOR280 power amplifier.  
Calibration: • Analyser: July 2018 (NATA cal)

## Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m<sup>3</sup> total room volume • approx 215 m<sup>2</sup> surface area excluding diffusers  
Diffusers: • 20 stationary diffusers, approx 40 m<sup>2</sup> total surface area  
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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Page 1 of 1



# Airborne Sound Attenuation between Rooms Sharing Common Ceiling Plenum

Unit 3/2 Hardy Street  
South Perth 6151  
Tel: 9474 4477  
Fax: 9474 5977

ALA Test No.: 15-086-3  
Project: Bailey Interiors  
Specimen: Nail-up Random CAC Meas.  
Detail: 600 x 600 Plaster Acoustic Tile

## Description of Specimen:

Nail-up Random 'straight edge' 600 x 600 X 28mm thick Plaster Acoustic Tile  
25mm glasswool insulation @ 32 kg/m3; compressed to 20mm  
Thin plaster skim coat over insulation to seal tile  
Sides of tile screw fixed to furring chennels  
Plaster Acoustic Tile has Butt joints to ends between furring channels  
Nominal open area 8.7%  
Nominal surface density 14.4 kg/m2

Meas. Date: 16-Apr-15

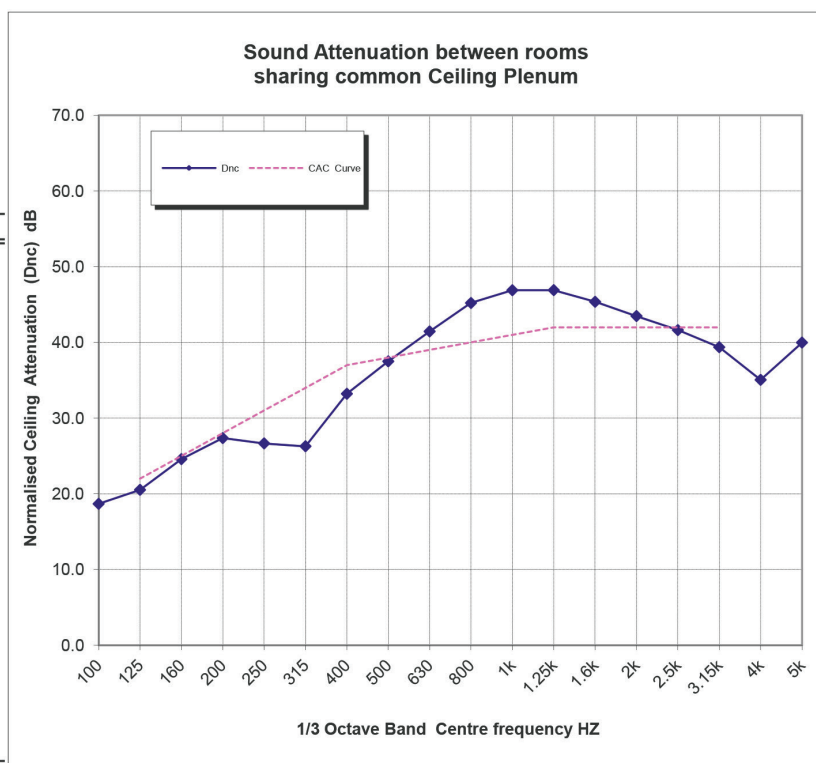
Tested in accordance with  
ASTM E1414 / E1414M - 11a


CEILING ATTENUATION CLASS

CAC

38

Centre Frequency Hz	Dnc dB	CAC Curve dB	Deficiencies dB
100	18.7		
125	20.5	22	1.5
160	24.6	25	0.4
200	27.4	28	0.6
250	26.7	31	4.3
315	26.3	34	7.7
400	33.2	37	3.8
500	37.5	38	0.5
630	41.4	39	
800	45.2	40	
1k	46.9	41	
1.25k	46.9	42	
1.6k	45.4	42	
2k	43.5	42	
2.5k	41.6	42	0.4
3.15k	39.4	42	2.6
4k	35.1	42	6.9
5k	40.0		
Total			28.8
CAC	38		



Signatory:   
Tester: N Gabriels B.Arch, FAAS

Date: 18-Apr-15



Checked: K Hearne B.Arch, MAAS



# AWTA PRODUCT TESTING

TEST REPORTS





# AWTA PRODUCT TESTING

Australian Wool Testing Authority Ltd - trading as AWTA Product Testing  
A.B.N 43 006 014 106

1st Floor, 191 Racecourse Road, Flemington, Victoria 3031  
P.O Box 240, North Melbourne, Victoria 3051  
Phone (03) 9371 2400

## Group Number Assessment

(In accordance with AS 5637.1-2015)

This is to confirm that the product as described below has been tested by AWTA Product Testing.

Testing was performed in accordance with AS/NZS 3837-1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.

As per AS 5637.1 Clause 9(n) it was valid to test this particular material / system in the cone calorimeter for the assignment of a NCC Group Number.

**Test Sponsor :** Bailey Interiors  
83-85 Boundary Road  
Mortdale NSW 2223

**Test Number :** 21-003623  
**Issue Date :** 28/07/2021  
**Print Date :** 11/08/2021

**Sponsor Product** Clients Ref : "Open Cell-Direct Fix/ Cell Sound/ Open Cell/ Super Diamond/ Shadex/ Cell Sound Panel/ Eco Check"  
Pre-Insulated plaster cast tiles  
Composite  
Nominal Mass per Unit Area/Density : Approx 16kg/m2  
Nominal Thickness : Approx 34mm

Product Group Number Classification : 1  
Group Number derived from : Sample A: Complete Tile  
Average Specific Extinction Area : 3.2 m<sup>2</sup>/kg



Fiona McDonald  
Testing Technologist

52983

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P.O Box 240, North Melbourne, Victoria 3051  
Phone (03) 9371 2400 Fax (03) 9371 2499

## TEST REPORT

**Client :** Bailey Interiors  
83-85 Boundary Road  
Mortdale NSW 2223

**Test Number :** 14-001048  
**Issue Date :** 31/10/2014  
**Print Date :** 1/10/2019

**Sample Description** Clients Ref : "New Shadex, Eco Check; Hush Tile; Shadex; Random"  
White molded plaster ceiling tiles - pre insulated with glass fibre batt  
Colour : White  
End Use : Ceiling tiles  
Nominal Composition : Plaster/fibreglass

### ASTM C518-2010

### Steady-State Thermal Transmission Properties by Means of the Heat Flow Apparatus

Date of Testing	20/10/2014	
Test Date	27/10/2014	
Test Apparatus	Lasercomp Fox 600	
Sample Orientation	Horizontal	
Mean Test Temperature	23	°C
Temperature Differential	20	°
Estimated uncertainty in results	3.9	
Specimen	1	2
Specimen Thickness (as received)	40	39 mm
Specimen Thickness (as tested)	40	39 mm
Specimen Density (as tested)	391	403 kg/m <sup>3</sup>
Test Duration	01:55	02:00 hrs:mins
Measured Heat Flux	26.0	27.8 W/m <sup>2</sup>
Measured Thermal Conductivity	0.0520	0.0544 W/m.K
Thermal Resistance	0.8	0.7 m <sup>2</sup> K/W

181403

1202

Page 1 of 1

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Accredited for compliance with ISO/IEC 17025 - Testing  
- Chemical Testing  
- Mechanical Testing  
- Performance & Approvals Testing

: Accreditation No. 983  
: Accreditation No. 985  
: Accreditation No. 1356



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0204/11/06

APPROVED SIGNATORY

MICHAEL A. JACKSON B.Sc.(Hons)  
MANAGING DIRECTOR

# AWTA PRODUCT TESTING

Australian Wool Testing Authority Ltd - trading as AWTA Product Testing  
A.B.N 43 006 014 106  
1st Floor, 191 Racecourse Road, Flemington, Victoria 3031  
P.O Box 240, North Melbourne, Victoria 3051  
Phone (03) 9371 2400 Fax (03) 9371 2499

## TEST REPORT

**Client :** Bailey Interiors  
83-85 Boundary Road  
Mortdale NSW 2223

**Test Number :** 15-002457  
**Issue Date :** 09/06/2015  
**Print Date :** 29/06/2018

### Replacement of Report dated :08/05/2018

**Sample Description** Clients Ref : "Shadex; Hush; Eco Check; New Shadex; Random; Casino; Open Cell; NUTR 2000 Super Diamond; Open Slot; Moon"  
White molded plaster ceiling tiles  
Colour : White  
End Use : Acoustic paneling  
Nominal Composition : Plaster  
Nominal Thickness : 28mm

#### ISO 5660.1-2002

Reaction to Fire Tests - Heat Release Smoke Production and Mass Loss Rate Part 1: Heat Release Rate (Cone Calorimeter Method)

	Specimen			Mean	
	1	2	3	fti	kW/m <sup>2</sup>
Average Heat Release Rate	fti	fti	fti	fti	
Group Number Classification	1	1	1		
(In Accordance with New Zealand Building Code Verification Method C/VM2 Appendix A)					
Average Specific extinction area	0.2	0.1	1.4	0.6	m <sup>2</sup> /kg

Test orientation : Horizontal

	Specimen			Mean	
	1	2	3		
Irradiance	50	50	50	50	kW/m <sup>2</sup>
Exhaust flow rate	24	24	24	24	L/sec
Time to sustained flaming	fti	fti	fti	fti	sec
Test duration	1800	1800	1800	1800	sec

15644

5140

Page 1 of 11

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*[Signature]*

APPROVED SIGNATORY

MICHAEL A. JACKSON B.Sc. (Hons)  
MANAGING DIRECTOR

0204/11/06



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P.O Box 240, North Melbourne, Victoria 3051  
Phone (03) 9371 2400

## TEST REPORT

**Client :** Bailey Interiors  
83-85 Boundary Road  
Mortdale NSW 2223

**Test Number :** 19-007603  
**Issue Date :** 4/02/2020  
**Print Date :** 4/02/2020

**Sample Description** Clients Ref : "Shadex, Hush,Eco Check,New Shades, Random, Casino,Open Cell, Nut R2000, Super Diamond, OpenSlot,Moon"  
Moulded Plaster Ceiling Tiles

### Dimensional Stability

Date of Testing	04/02/2020		
Change In	Length (%)	Width (%)	Thickness (%)
Specimen			
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0
Mean	0.0	0.0	0.0

Tested conditions: 168 hours at 50degC and 95% Relative Humidity  
Observation: After exposure no change in dimension and appearance

192823 41504

Page 1 of 1

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0205/11/06

  
APPROVED SIGNATORY

  
MICHAEL A. JACKSON B.Sc.(Hons)  
MANAGING DIRECTOR



19 November 2019

BAILEY INTERIORS  
 83 to 85 Boundary Road  
 Mortdale NSW 2223

Attention: Roger Bailey

## EFFECT OF INSULATION OVER PLASTER CEILING TILES ACOUSTIC OPINION

Dear Roger,

As requested, we provide an acoustic opinion on the improvement in the Ceiling Attenuation Class (CAC) performance of Bailey Interior Plaster Acoustic tiles resultant from an insulation blanket strip located above the ceiling tiles either side of the ceiling height partition wall.

### 1. BACKGROUND.

As discussed, an acoustic opinion provided by Gabriels Environmental Design dated 27 March 2015 indicated that In 2015, the Acoustic Laboratories Australia Pty Ltd carried out acoustic test of the Room-to-room sound insulation of Plaster Acoustic panels as manufactured by Bailey Interiors. The tests were carried out in accordance with the Australian Standard AS2499:2000, *Acoustics – Measurement of sound insulation in buildings and of building elements – Laboratory measurement of room-to-room airborne sound insulation of a suspended ceiling with a plenum above it*.

The room-to-room sound insulation tests was carried out on a typical Bailey Interior product "Old Shadex" plaster acoustic tile, and a second test was carried out of same ceiling with a 1.8m wide strip of R3.5 Earthwool insulation located both side of the separating wall below the ceiling.

The result of the above tests was a 4 dB improvement in the room-to-room sound insulation performance in terms of the the Weighted Suspended Ceiling Normalised Level ( $D_{n,c,w}$ ).

Gabriels Hearne Farrell Pty Ltd have been requested by Bailey Interiors to provide an opinion of the expected improvement of providing a 1.8m wide strip of insulation on both sides of the separating partition wall in terms of the Ceiling Attenuation Class (CAC) performance; (ASTM E1414/E1414M – 11a *Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum*).

### 2. COMPARATIVE TEST PROCEDURES:

The test procedure for the Australian and American Standards are very similar. The laboratory set up at Acoustic Laboratories Australia can be set up to measure in accordance with both standards. The main difference in the two standards is that the Australian standard ( $D_{n,c,w}$ ) requires acoustic absorption in the ceiling plenum space on the two end plenum walls and one side plenum wall. The American Standard (CAC) requires acoustic absorption on all four plenum walls.



**PROJECT:** Bailey Interiors  
**PROJ No:** 19-023g-1

**DATE:** 19 Nov. 19  
**PAGE** 2

### 3. ASSESSMENT

The effectiveness of the acoustic absorbent R3.5 Earthwool insulation installed as a 1.8m strip of insulation on both sides of the ceiling height partition wall is to a large extent dependant on the increase in the total absorption in the ceiling void. In the American (CAC) test method there is additional acoustic absorption in the ceiling void plenum space compared to the Australian ( $D_{n,c,w}$ ) set up. It is therefore expected that the decibel (dB) improvement in sound insulation if tested in accordance with the American Standard would be less than when tested in the Australian standards.

Based on the above, it is our opinion that the improvement in the room-to-room CAC performance if the Bailey Interior "Old Shadex" plaster acoustic tile with strip acoustic absorption on either side of the partition were carried out to American Standard the improvement in Ceiling Attenuation Class (CAC) performance would be in the order of 2 to 3 dB

#### Conditions

The information given in this opinion represents extrapolation based on laboratory test carried out on Bailey Interiors plaster acoustic tile products. The assessment and opinions expressed refer to the expected comparative laboratory performance of the product when tested and rated in accordance with America Standard ASTM E1414/E1414M – 11a.

The assessment and opinions expressed refer to the expected laboratory performance of the product. It is assumed that when installed in the field the products are installed in accordance with manufacturer's instructions and installed with good workmanship. No allowance is made for flanking transmission and acoustic leakage via the construction, as these are construction and design issues that must be considered in the design and construction of individual projects.

This assessment is only valid for 5 years. It assumes there is no change in the construction of the material systems. This assessment addresses the acoustic performance only.

Where construction systems are to be extensively used, or are required to comply with specific or stringent specification requirements, it is strongly recommended that the product be laboratory tested. It must be noted that an acoustic opinion provides an estimate of performance and that the likely performance is usually within +/- 3 dB of the opinion.

We trust this proposal meets your requirements. Please call if you require any clarifications.

Yours Faithfully



Norbert Gabriels B.Arch F.A.A.S for

#### **GABRIELS HEARNE FARRELL PTY LTD**

Member Firm – Association of Australasian Acoustical Consultants

A Unit 3 / 2 Hardy St, SOUTH PERTH WA 6151 P (08) 9474 5966  
 E kingsley@gabriels.net.au W gabriels.net.au M 0407 470 865



**BAILEY**  
*Interiors*  
Architectural Plaster

83 Boundary Road  
(PO Box 78)  
Mortdale NSW 2223

ABN 36 003 722 665

T 612 9153 9326  
F 612 9534 6532  
E [sales@baileyinteriors.com.au](mailto:sales@baileyinteriors.com.au)  
W [www.baileyinteriors.com.au](http://www.baileyinteriors.com.au)

7 October 2015

Northern Territory Government  
Department of Infrastructure  
Level 5 Highway House  
Palmerston Circuit  
P O Box 61 Palmerstone N T 0831

Attention: Kurt Leerburg

**"ACOUSTIC CEILING PRODUCTS AS PROJECT SPECIFIC FACTORY  
DIRECT PACKAGES "  
"INCLUSIVE GRID WITH WARRANTY"**

Australian Plaster Acoustics has been developing these plaster tiles in conjunction with its parent company Bailey Interiors for the last 5 years.

The organisation has a strong commitment to innovation with major research and development programmes resulting in producing outstanding designs that are truly innovative, lightweight exceptionally high acoustic ratings (NRC) (CAC ) and R values . The tiles are fire resistant, pre painted with anti mould paint, will not warp or buckle under humid conditions.

Big innovations have been

- 1) The reduction in weight of each tile bringing overall weight down from approx. 19.50 Kilos m2 - 12.75 kilos m2( in most cases )this has resulted in being able to use a lighter grid for installation as per Rondo Design confirmation REF 4562-15-001.
- 2) The introduction of silicone rubber moulds this has made it possible to create very strong, clean, and sharply designed undercut ceiling tiles which are truly innovative this has only been possible with our strong commitment to R & D.

Australian Plaster Acoustics warrants all plaster products in conjunction with Rondo grid systems from the date of purchase for a period of 10 years.

This warranty does not apply to damage caused by

- 1) Normal wear and tear.
- 2) The fitting of components not supplied by Australian plaster Acoustics /Bailey Interiors or Rondo.
- 3) Repair ,Maintenance or service by a person not authorised by Rondo /Bailey Interiors

We Rondo and Bailey Interiors are jointly marketing these products, plaster acoustic tiles and ceiling grid as a package directly to the builder after nomination from the Department of Infrastructure.

Yours Faithfully,  
**Bailey Interiors Pty Ltd**

Roger Bailey  
Managing Director  
Phone 02 91539326  
Fax 0295346532  
Email: [roger@baileyinteriors.com.au](mailto:roger@baileyinteriors.com.au)



**RONDO®**Rondo Building Services Pty Limited  
ABN 69 000 289 207**NATIONAL**57-87 Lockwood Rd, Erskine Park, NSW, 2759  
(PO Box 324 St Marys NSW 1790)  
TEL (02) 9912 7300 FAX: (02) 9912 7310**CUSTOMER SERVICE HOTLINE**

1300-36-RONDO (1300-36-7663)

[www.rondo.com.au](http://www.rondo.com.au)To whom It may concern

Rondo Building Services is Australasia's largest manufacturers of roll formed lightweight steel building products for internal and external use, from steel stud and track drywall systems to building board finishing sections and from exposed and concealed ceiling systems to access panels and other ancillary products.

Rondo has been producing product to serve the building industry for over 50 years and not only has manufacturing facilities in Australia but also New Zealand, Malaysia and India as well as JV's elsewhere.

During that period Bailey Interiors manufacturers of Australian Plaster Acoustics panels has been a valued customer of Rondo.

Rondo has been pleased to partner with Bailey Interiors in the development of its innovative plaster acoustic panels by providing specification assistance in the use of the Rondo Duo<sup>®</sup> Exposed Ceiling Grid System in conjunction with their panels, thereby ensuring their clients have a code compliant suspended ceiling grid system to support their plaster acoustic ceiling panels.



Steve Jupp  
Product & Innovation Manager  
Rondo Building Services Pty Ltd

AUSTRALIA • NEW ZEALAND • MALAYSIA • MIDDLE EAST • INDOCHINA



## TO WHOM IT MAY CONCERN

Gyprock provides a comprehensive range of high performance plasterboard wall and ceiling lining solutions across all segments of the construction industry. Gyprock is also a supplier of casting plaster used in the manufacture of cast plaster products and decorative cornices. Gyprock is one of the many companies owned and operated by CSR Limited, one of Australia's oldest and most respected public companies founded in Sydney in 1855 as the Colonial Sugar Refining Company.

When Gyprock opened its Concord Plaster Mills in 1942, it soon became a supplier of casting plaster to Ernest Alfred Bailey who had established E. A. Bailey & Sons Pty Ltd in Boundary Road, Mortdale in 1938. Since that initial supply, Gyprock has maintained its long association with the Bailey family and continues today to supply its casting plaster to Bailey Interiors.

Over that time, Bailey Interiors has grown in significance to become the largest supplier of all types of architectural plaster products in Sydney and one of Gyprock's major customers for casting plaster. Bailey Interiors has always employed continuously innovative approaches to the manufacture of cast plaster products and demonstrates considerable expertise in moulding and casting from simple to complex shapes.

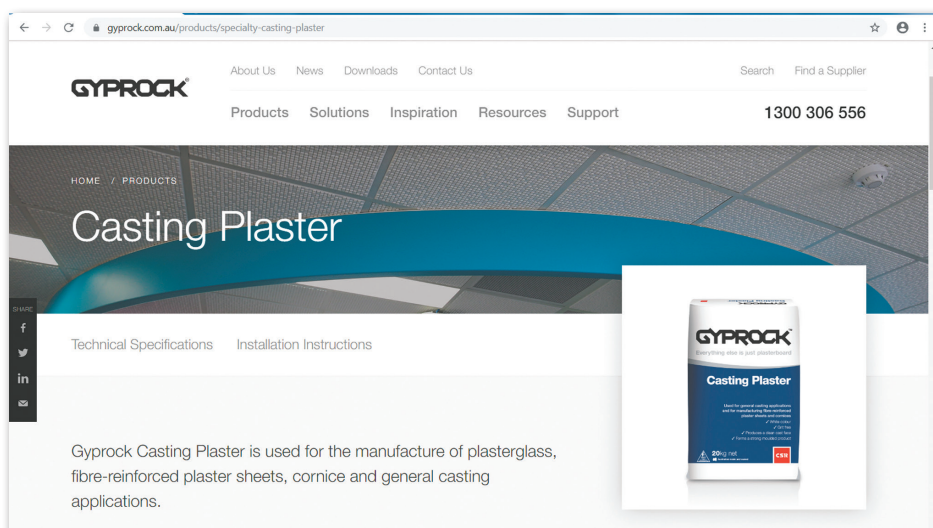
For over 80 years, CSR has manufactured glasswool insulation under the Bradford brand. Bradford is a supplier of insulation batts and acoustic fabrics used by Bailey Interiors in the manufacture of their exceptionally high performing plaster acoustic ceiling tiles namely for NRC and CAC.

---

CSR Building Products Limited ABN 55 008 631 356  
Commercial Design Centre 7 Slough Avenue Silverwater NSW 2128  
Mobile: 0419 477 359 Telephone: 02 8748 1450  
Facsimile: 02 8748 1488 Email: [aveling@csr.com.au](mailto:aveling@csr.com.au)







#### TO WHOM IT MAY CONCERN

Gyprock manufactures and supplies a comprehensive range of high performance plasterboard wall and ceiling lining solutions across all segments of the construction industry. Gyprock is one of the many companies owned and operated by CSR Limited, one of Australia's oldest and most respected public companies founded in Sydney in 1855 as the Colonial Sugar Refining Company.

Gyprock is the major supplier of casting plaster used by Australian Plaster Acoustics in the manufacture of their innovative plaster acoustic tiles. These exceptionally high performing plaster acoustic ceiling tiles are manufactured at Bailey Interiors' modern facility utilising the latest, innovative plaster tile manufacturing process. Gyprock has been a casting plaster supplier to Bailey Interiors for over 75 years.

CSR also manufactures Bradford glasswool insulation. Bradford is a supplier of insulation batts and acoustic fabrics used by Australian Plaster Acoustics. The resulting range of plaster acoustic tiles have exceptionally high performing acoustics for NRC and CAC with a modern architectural appearance.

Gyprock and Bradford are proud to be associated with Australian Plaster Acoustics and we feel confident that, based on our long association, Australian Plaster Acoustics will provide a high level of product quality, reliable service, trusted performance and industry compliance associated with their large range of plaster acoustic tiles.

Antoine Veling  
NSW Commercial Segment Manager  
CSR Lightweight Systems

CSR Building Products Limited ABN 55 008 631 356  
Commercial Design Centre 7 Slough Avenue Silverwater NSW 2128  
Mobile: 0419 477 359 Telephone: 02 8748 1450  
Facsimile: 02 8748 1488 Email: aveling@csr.com.au



## MATERIAL SAFETY DATA

### Product Name: FBS-1 Glasswool Insulation

is classified as **Non-Hazardous** according to the criteria of the Australian Safety and Compensation Council ASCC (formerly NOHSC) Approved Criteria For Classifying Hazardous Substances. FBS-1 Glasswool Insulation is classified as **Non-Dangerous Goods** according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

- Full test results of each product for acoustic NRC and CAC can be viewed online at [www.australianplasteracoustics.com.au](http://www.australianplasteracoustics.com.au).
- All ceiling grid and steel support systems by Rondo can be viewed from PDF files on request.
- All acoustic test are NATA approved

## DISCLAIMER

Products manufactured and systems designed by Bailey Interiors are produced in accordance with the building code of Australia and New Zealand Building Code and also relevant Australian and New Zealand standards.

All acoustic testing for NRC - (Noise Reduction Coefficients) was carried out in accordance with these standards at RMIT University, Melbourne, Australia and CSIRO, Melbourne, Australia.

All sharing common ceiling testing CAC - (Ceiling Attenuation Class) was also carried out in accordance to Australian and New Zealand standards at Acoustic Laboratories Australia Pty Ltd.


All fire resistance Group 1, thermal resistance testing were also carried out to the latest Australian and New Zealand standards at AWTa a product testing in Melbourne, Australia.

All light reflective tests carried out by Light Lab International, QLD Australia in accordance with NATA accreditation.

All these products received excellent results in all instances they were tested in true laboratory situations which may differ to readings recorded on site.

Australian Plaster Acoustics will not be held responsible for any claims resulting from installation of its products not in accordance with manufacturers recommendations or relevant Australian and New Zealand standards.





Bailey Interiors has been supplying the building and architectural industry with the finest quality acoustic tiles for nearly eighty years. The Acoustic Tile Range features outstanding quality, elegant style, finish and functionality.

## Green Product Sheet

### Made to last a lifetime

Bailey Interiors Architectural products are made of the finest Gypsum. They have timeless features and built for longevity.

### Made of natural Gypsum

Bailey Interiors Architectural products are a unique blend of at least 75% naturally occurring Gypsum.

### Energy and water-efficient

Bailey Interiors Architectural products are more energy and water-efficient than alternative acrylic and resin based products. Bailey Interiors have installed a unique water recycling process whereby excess water from the production runs are recycled and used again in further production. The high Gypsum content also outperforms acrylic, which quickly dissipates water heat, resulting in reduced use of water.

### Minimal manufacturing impact

Bailey Interiors Architectural products are created by a combination of machine made and hand made production methods. This combination allows for a better quality product as compared with acrylic, and composite products.

Bailey Interior's Architectural products also use significantly less energy than electrically high – heat ovens. They use a combination of natural drying and gas operated ovens.

Additionally Bailey Interiors Architectural products are hand finished by craftsmen, further reducing reliance on non renewable resources.

### Minimal impact on the environment

Bailey Interiors Architectural Products are made of the finest Gypsum.

Bailey Interiors have installed two filtration units on top of the bulk silo bin. These units absorb any excess plaster dust from going in to the atmosphere whilst the plaster silo is being loaded with plaster which is pumped by compressed air from the bulk plaster truck. These filtration units allow for the air to remain clean and clear which does not impact on the environment.

### Recycled Shipping

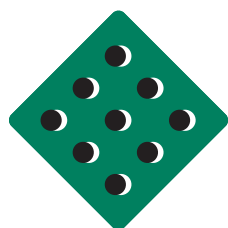
Bailey Interiors Architectural products are shipped on pallets made of reclaimed wood, with strapping made from recycled bottles.

### Recycled Waste Plaster

Bailey Interiors have a special method of recycling excess casting plaster and fibre glass reinforcement. This material is transported from Bailey's current work place to be recycled as part of road base material.

***Customers who choose Bailey Interiors Architectural products know they are making an environmentally good choice because they are making a purchase lasting a lifetime.***





# AUSTRALIAN PLASTER ACOUSTICS

Innovative Sound Solutions

Australian Plaster Acoustics Pty Ltd  
ABN 69 610 255 242

Visit our showroom at  
83-85 Boundary Road  
Mortdale NSW 2223  
Australia

Tel: +612 9533 3909  
Fax: +612 9534 6532  
Eml: [sales@australianplasteracoustics.com.au](mailto:sales@australianplasteracoustics.com.au)  
Web: [www.australianplasteracoustics.com.au](http://www.australianplasteracoustics.com.au)