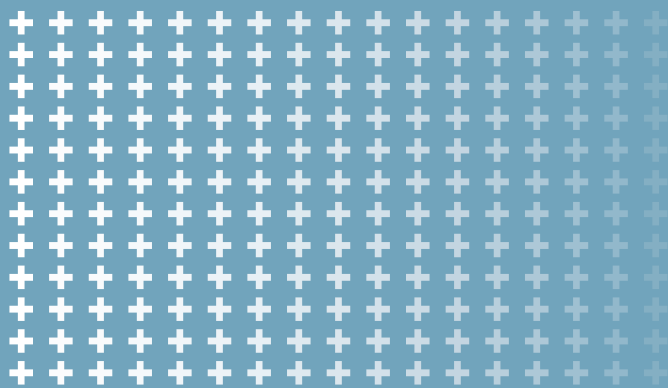


- G 2 INTRODUCTION
- G 11 CEILING UNDER TIMBER FLOOR
- G 18 CEILING UNDER CONCRETE FLOOR
- G 20 CEILINGS UNDER ROOF
- G 24 SPANNING CEILINGS
- G 26 ACOUSTIC CEILINGS
- G 28 OVER PARTITION SYSTEMS

CEILINGS



INTRODUCTION

CONVENTIONAL CEILINGS

DESCRIPTION

USG Boral conventional ceilings comprise single or multiple-layer plasterboard linings attached to the underside of floor or roof structure above.

DESIGN OPTIONS

USG Boral offers a wide range of plasterboard ceiling systems for application under floors or roofs.

CEILINGS UNDER TIMBER FLOORS

Acoustic ratings are provided for ceilings under timber framed floors with min 240mm joists, 19mm particleboard and the following floor covering options:

- Timber flooring (min 8.5kg/m²) with or without acoustic underlay
- Carpet with foam underlay
- Ceramic Floor Tiles on nom 6mm Cement Sheet (total mass min 15kg/m²).

Non-fire rated ceiling systems are available with acoustic ratings up to $R_w=53$ or $R_w+C_{tr}=47$.

FIRE RATED CEILINGS

Fire rated ceiling systems are available with Fire Resistance Levels up to 120/120/120, Resistance to Incipient Spread of Fire (RISF) up to 120min, and acoustic ratings up to $R_w=60$ or $R_w+C_{tr}=55$.

CEILINGS UNDER CONCRETE FLOORS

Acoustic ratings for ceilings under concrete floors are provided for 150mm and 200mm slab thicknesses and the following floor coverings:

- Timber flooring (min 8.5kg/m²) with or without acoustic underlay.
- Carpet + underlay.
- Tiled floor with or without acoustic underlay.

CEILINGS UNDER ROOFS

Acoustic ratings for ceilings under roofs are provided for:

- Tiled pitched roofs with sarking
- Metal pitched roofs with roofing blanket insulation
- Metal Flat Roofs with roofing blanket insulation and min 190mm rafters.

ATTACHMENT OPTIONS

Ceiling attachment options vary depending on the structure above and include:

- Direct fixed
- Furred
- Furred with acoustic mounts
- Suspended
- Suspended with acoustic mounts.

DESIGN CONSIDERATIONS

- USG Boral ceiling systems are not designed to support the weight of construction or maintenance personnel, additional plant or storage of goods.
- Fire rated ceiling can be curved to a minimum radius of 6000mm.
- Ceiling can be constructed to a pitch of up to 70 degrees from the Horizontal.
- Ceiling systems can incorporate the following approved features: Access Panels, Bulkheads, Light & Luminaire fittings, Plumbing Pipe penetrations, Power Cable penetrations, Loaded penetrations, Control Joints, Protection to Steel and Timber Beams, Changes in ceiling slope direction and a variety of Perimeter Details.
- The use of false ceilings may eliminate the need for penetrations in fire rated ceilings. Refer USG Boral for acoustic rating of fire rated ceiling systems with false ceilings.
- Suspension grids must be installed in accordance with Rondo and USG Boral specifications.

NOTES:

- Each suspension point must be capable of supporting a weight of 50kg in addition to the self-weight of the system and pressure loads.
- Extra suspension components must be provided to support light fittings, bulkheads and other fixtures.
- Plasterboard spans and total loads directly supported on ceiling linings must not exceed the values indicated in Table G1. Any additional loads must be independently supported from a roof or ceiling structure.
- Spans of Rondo 129 furring channels must not exceed the values indicated in Table G2.
- Spacings of acoustic ceiling mounts must not exceed the values indicated in Table G3.
- Refer to USG Boral for maximum spans and spacings of USG Boral Drywall Grid System.

» INTRODUCTION

TABLE G1: MAXIMUM LOADS AND SPANS FOR INTERNAL NON-FIRE RATED CEILINGS

PLASTERBOARD TYPE	SPAN mm	MAXIMUM TOTAL LOAD* FOR GIVEN WIND CLASS kg/m ²			
		N1	N2	N3	N4
10mm SHEETROCK BRAND CEILING BOARD 13mm SHEETROCK BRAND STANDARD	600 (max)	2.6 [†]	2.6 [†]	2.0	2.0
	450	2.6 [†]			
10mm UNISPAN 13mm REGULAR	600 (max)	2.0			
	450	2.6 [†]			
10mm SHEETROCK BRAND WALL BOARD 10mm REGULAR 10mm WET AREA BOARD	450 (max)	2.0			

* Total Load includes weight of insulation and any fixtures directly supported on ceiling linings.

† 1/3 Fixing method or full screw fixing must be used for non-fire rated ceilings if directly supported load exceeds 2.0kg/m² (maximum load 2.6kg/m²).

NOTE

Loads in excess of the above must be supported independently from a roof or ceiling structure.

TABLE G2: MAXIMUM SPANS OF CONTINUOUS RONDO 129 FURRING CHANNELS

CEILING LINING	WIND CLASS N2		WIND CLASS N3	
	@ 450mm	@ 600mm	@ 450mm	@ 600mm
1x10mm (7.2kg/m ² max)	2070	1900	1850	1630
1x13mm (9.2kg/m ² max)	2060	1850	1810	1600
1x16mm (13kg/m ² max)	1890	1760	1750	1540
2x10mm (14.4kg/m ² max)	1680	1530	1680	1525
2x13mm (18.4kg/m ² max)	1650	1530	1650	1470
2x16mm (26kg/m ² max)	1510	1400	1510	1390

Source: Rondo Building Services

TABLE G3: MAXIMUM SPANS AND SPACINGS OF FURRING CHANNELS WITH ACOUSTIC MOUNTS*

PLASTERBOARD LININGS	JOISTS @ 450mm		JOISTS @ 600mm	
	FURRING CHANNEL SPAN mm	FURRING CHANNEL SPACING mm	FURRING CHANNEL SPAN mm	FURRING CHANNEL SPACING mm
1x13mm SOUNDSTOP or FIRESTOP	1350 (R, B)	600	1200 (R, B)	600
1x16mm FIRESTOP	1350 (R, B)	600	1200 (R, B)	600
2x13mm SOUNDSTOP or FIRESTOP	1350 (W)	600	1200 (R, B)	600
1x13mm + 1x16mm FIRESTOP	1350 (W)	600	1200 (B)	600
2x16mm FIRESTOP	1350 (W)	600	1200 (W)	600
	900 (R, B)	600	600 (R, B)	600
3x16mm FIRESTOP	900 (W)	600	1200 (W)	450
4x16mm FIRESTOP	900 (W)	450	600 (W)	600
	450 (R, B)	450	600 (R, B)	450

* Based on maximum allowable loads with acoustic mounts

Legend:

R Rondo STWC Sound Isolation Mount (max load 16kg/mount)

B Embelton Acoustic Mount – 'Blue' dot rubber element (max load 17kg/mount with 5mm static deflection)

W Embelton Acoustic Mount – 'White' dot rubber element (max load 25kg/mount with 5mm static deflection)

» INTRODUCTION

MATERIALS

The following materials and components are utilised in USG Boral conventional ceiling systems listed in this manual:

CEILING LININGS

- 10mm SHEETROCK Brand Ceiling Board
- 13mm SHEETROCK Brand Standard plasterboard
- 10mm Unispan plasterboard
- 13mm Regular plasterboard
- 10mm/13mm Soundstop plasterboard
- 13mm/16mm Firestop plasterboard.

FURRING CHANNELS AND FIXING CLIPS



Figure G1: **Rondo 129 Furring Channel**



Figure G2: **Rondo 237 Fixing Clip**



Figure G3: **Rondo STWC Sound Isolation Mount**



Figure G4: **Embelton Ceiling Isolation Hanger LB Bracket (Blue Dot Rubber Element)**



Figure G5: **Embelton Ceiling Isolation Hanger HB Bracket (White Dot Rubber Element)**

SUSPENDED CEILING SYSTEMS

- USG Boral Drywall Grid System
- Rondo KEY-LOCK® Concealed Suspended Ceiling.

INSULATION

- R2.5 Pink Ceiling Batts® by Fletcher Insulation
- R3.0 Pink Ceiling Batts® by Fletcher Insulation
- 50mm Pink® Partition 11kg/m³ glasswool by Fletcher Insulation
- 50mm Polyester insulation 7kg/m³ density
- Sisalation® reflective foil insulation by Fletcher Insulation
- Permastop® building blanket by Fletcher Insulation.

INSTALLATION

DIRECT FIXED SYSTEMS

Where fixing direct to timber or steel framing, framework spacing must not exceed plasterboard span values indicated in Table G1 or 600mm for fire resistant boards.

NOTE

Furred systems are recommended to minimise the risk of ceiling damage due to structural, thermal and seasoning movements.

FURRED AND SUSPENDED SYSTEMS

- Ensure that furring channels or suspended grid are installed to a true and level plane.
- Plasterboard supporting members must be spaced at max 600mm ctrs.
- Furring channels should be taken to and provided within 100mm of ceiling perimeter (min 15mm end clearance is required at walls).
- Allow for an expansion gap at the rate of 3mm per 1 metre run in abutting furring channels and Top Cross Rails in fire rated systems.
- Rondo KEY-LOCK concealed suspended ceiling system must be installed in accordance with Rondo specifications.
- USG Boral Drywall Grid System must be installed in accordance with USG Boral specifications.

» INTRODUCTION

PENETRATIONS

Penetrations in a fire rated system must be treated strictly in accordance with relevant test reports and approved installation details in order to maintain the system's Fire Resistance Level.

Where components by others are specified in USG Boral fire rated penetration details (ie dampers, GPO's, fire collars, etc), such components must be installed in accordance with the manufacturer's specifications. It is the responsibility of the component manufacturer to ensure that the fire rating performance of the system is not affected.

MOVEMENT AND CONTROL JOINTS

- Control joints in internal ceilings should be spaced at 12m max intervals in both directions (15 metre intervals in ceilings with perimeter relief). Control joints in external ceilings should be spaced at 6m max intervals in both directions.
- Control joints must be provided over movement joints in the substrate or structural elements and at every change of lining or substrate material.
- Refer to Junctions and Penetrations section for control joint details in fire rated ceilings.
- Control joints in non-fire rated ceilings can be formed by fitting Rondo P35 Control Joint or plastic expansion beads.
- In multi-layer non-fire rated systems control joints can be provided in the face layers only.

PLASTERBOARD FIXING

Fire Rated Ceilings

- Plasterboard linings in fire rated plasterboard ceilings must be installed using screw fixing only. Adhesives are not permitted.
- Apply plasterboard sheets with recessed edges at right angles to framing members.
- In single layer systems, place butt joints on framing or mid-way between the framing members and back-block as shown in the Junctions and Penetrations section.
- Screw fix the first (uppermost) layer sheets at 200mm max centres in the field of the board and at 150mm max centres along the board ends and edges. Stagger edge screw fixings in adjacent sheets.
- Screw fix additional plasterboard layers in the same manner as the first layer but with all joints in adjacent layers staggered min 200mm. If butt joints in additional layers fall between the framing members, screw laminate sheet ends to the previous layer with appropriate Laminating screws at 200mm max centres (refer to General Information — Materials — Screws).

Non-fire Rated Ceilings

- Apply plasterboard sheets with recessed edges at right angles to framing members.
- Single layer non-fire rated plasterboard ceiling systems can be fixed using combination of Adhesive and Mechanical Fasteners as outlined in USG Boral Installation Manual (see Figure G7) or Mechanical Fasteners Only.
- Multi-layer non-fire rated plasterboard ceiling systems must be fixed using Mechanical Fasteners Only method.
- In single layer systems, butt joints must be between the framing members and back-blocked as described in USG Boral Installation Manual. All recessed joints in an area containing three or more joints must also be back-blocked.

NOTE

USG Boral recommends back-blocking of all ceiling joints.

JOINTING AND FINISHING

- Stop and finish face layer plasterboard joints with USG Boral jointing system as outlined in USG Boral Installation Manual.
- Plasterboard joints in inner layers of multi-layer fire rated and non-fire rated systems are not required to be stopped.

NOTE

Paper jointing tape must be used in fire rated systems.

» INTRODUCTION

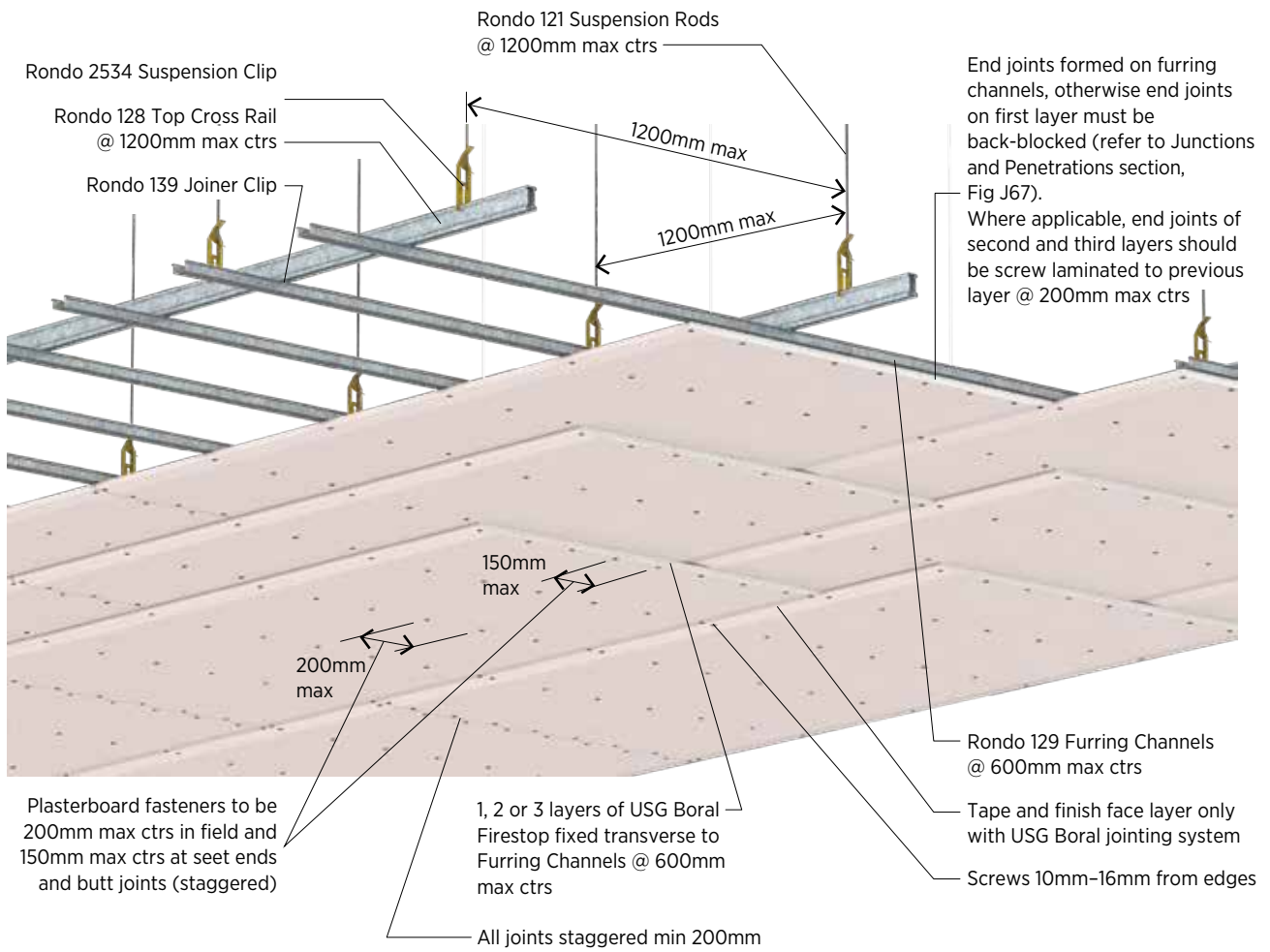


Figure G6: Fire Rated Ceiling – Screw Fixing Layout

» INTRODUCTION

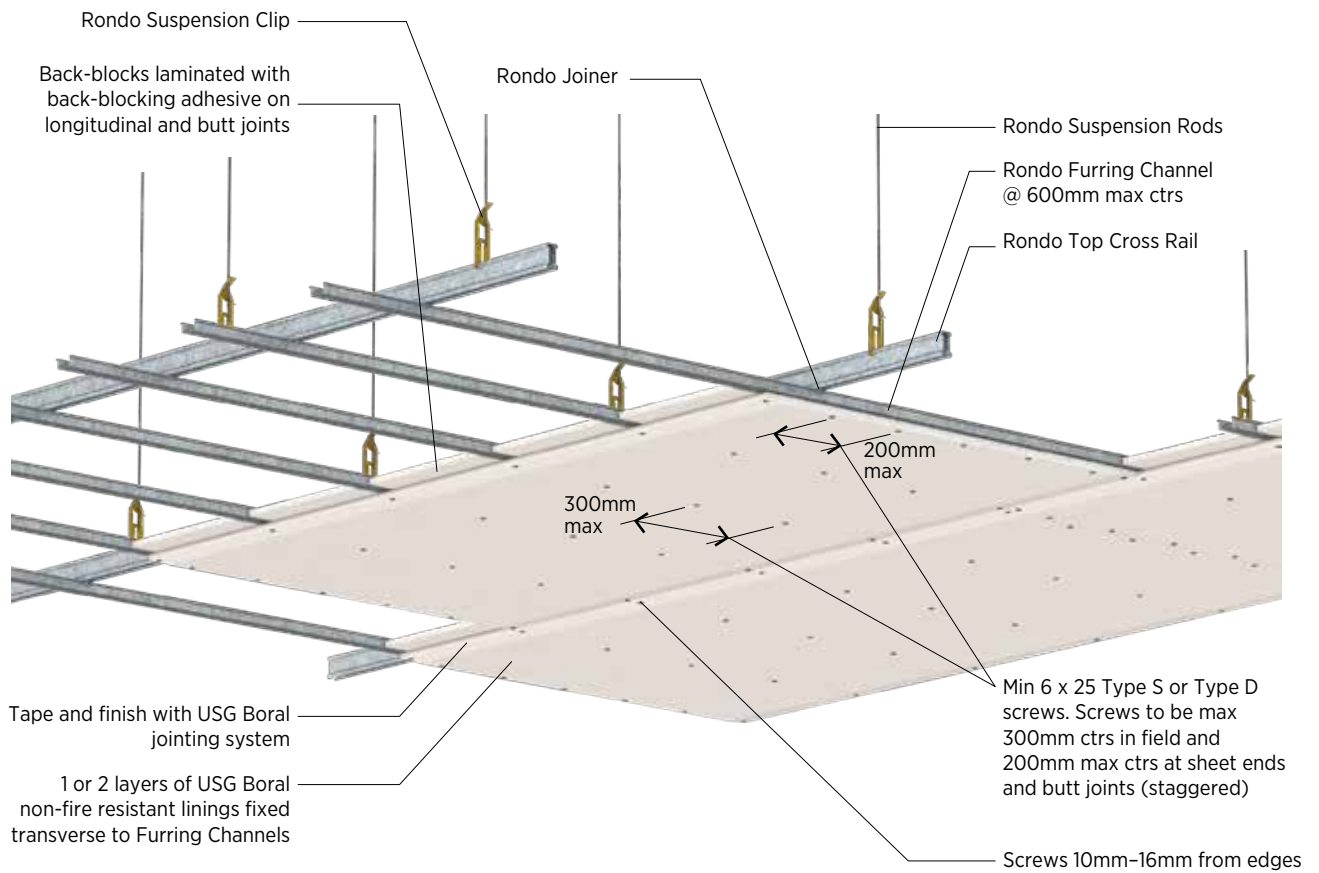


Figure G7: Non-Fire Rated Ceiling – Screw Fixing Layout

TABLE G4: SCREW FIXING LAYOUT	
MINIMUM FIXING POINTS PER SHEET WIDTH	
PLASTERBOARD WIDTH (mm)	SINGLE SCREWS
900	4
1200	5
1350	6

» INTRODUCTION

SPANNING CEILINGS

DESCRIPTION

USG Boral Spanning Ceilings are self-supporting fire rated plasterboard ceilings utilising Rondo C-stud or CH-stud sections as joists.

While construction of C-stud ceilings requires access from above and below, CH-stud ceilings can be constructed from one side only.

DESIGN OPTIONS

USG Boral Spanning Ceilings are available in Fire Resistance Levels up to 120/120/120 from both directions and up to 180/180/180 from above only.

MATERIALS

The following materials and components are utilised in USG Boral Spanning Ceilings:

CEILING LININGS

- 13mm/16mm Firestop plasterboard
- 25mm Shaftliner plasterboard.

CEILING JOISTS

- 150mm Rondo lipped C-studs 0.75mm Base Metal Thickness (BMT)
- 64mm Rondo CH-studs 0.55mm and 0.90mm BMT
- 102mm Rondo CH-studs 0.55mm and 0.90mm BMT.

INSULATION

- 50mm/90mm Pink® Partition 11kg/m³ glasswool by Fletcher Insulation
- 50mm/90mm Polyester insulation 14kg/m³ density.

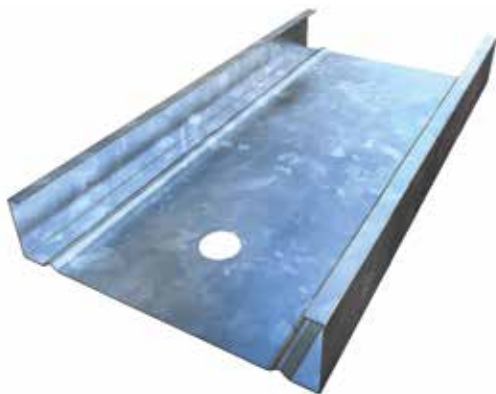


Figure G8: Rondo 150mm C-stud

CEILING SPANS

Ceiling spans must not exceed the maximum values shown in the corresponding Maximum Spans tables.

INSTALLATION

- For screw fixing requirements refer plasterboard installation instructions for fire rated conventional ceilings.
- In spanning C-stud ceilings, stagger joints on opposite sides of the ceiling by 300mm min.
- Stagger joints in adjacent plasterboard layers by 200mm min.
- Caulk perimeter gaps with approved fire rated sealant.

JOINTING AND FINISHING

- Stop and finish visible plasterboard joints with USG Boral jointing system as outlined in USG Boral Installation Manual.
- Plasterboard joints in inner layers of multi-layer systems are not required to be stopped.

NOTE

Paper jointing tape must be used in fire rated systems.



Figure G9: Rondo CH-Stud

» INTRODUCTION

ACOUSTIC CEILINGS

DESCRIPTION

USG Boral Acoustic Ceilings comprise a wide range of mineral fibre tile and perforated plasterboard ceilings with various sound absorption ratings (NRC and α_w) and over partition ratings (CAC and $D_{nc,w}$).

Custom perforated Pixels metal panels are also available for bespoke applications. Refer USG Boral for more information.

DESIGN OPTIONS

MINERAL FIBRE TILE CEILINGS

USG Boral mineral fibre tiles offer designers and builders a wide range of options with respect to:

- Surface textures and colours
- Edge and Grid profiles
- Noise Reduction Coefficient (NRC)
- Ceiling Attenuation Class (CAC)
- Light Reflectance (LR)
- Volatile Organic Compound (VOC) emissions
- Mould and bacteria resistance
- Recycled content
- Cost.

Refer Acoustic Ceilings tables for the range of available Mineral Fibre Tile products.

ECHOSTOP® PLASTERBOARD CEILINGS

Echostop perforated plasterboard ceilings offer combined benefits of decorative finish and a high level of sound absorption.

Echostop perforated plasterboard is suitable for full ceiling installation or feature panels on walls or ceilings.

Created for noise absorption treatment, Echostop is available in a number of stylish designs to suit multiple applications:

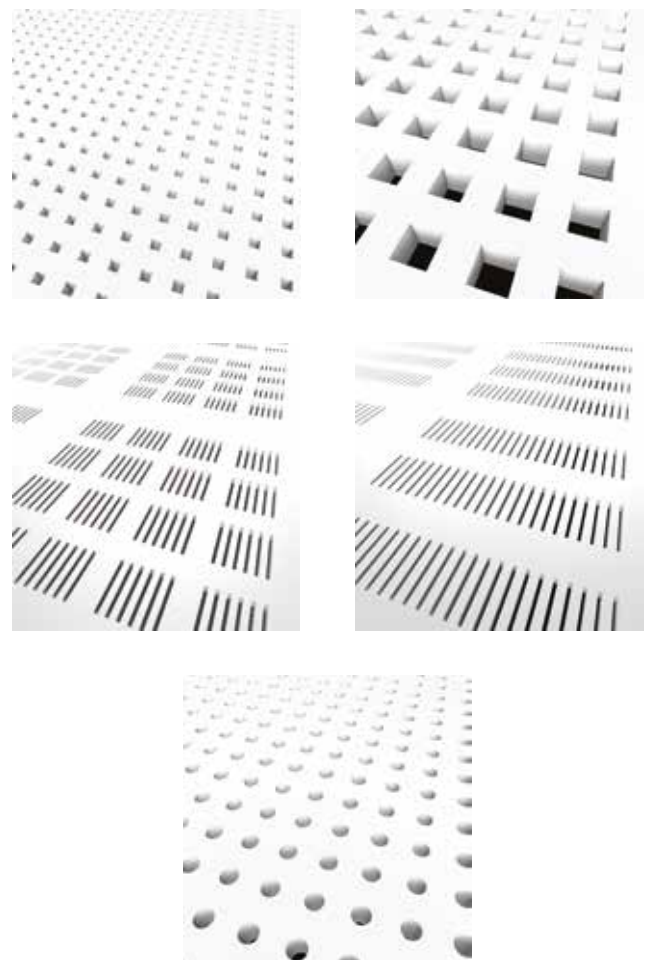


Figure G10: **Echostop patterns**

Refer to Echostop datasheets for acoustic performance of various Echostop panels.

» INTRODUCTION

DESIGN CONSIDERATIONS

Selection of an appropriate acoustic ceiling solution may involve a large number of considerations such as aesthetics, acoustic performance, VOC emissions, mould and bacteria resistance, cost, etc.

Acoustic Ceilings tables included in this manual provide essential information on performance and features of USG Boral acoustic panels. For additional information refer relevant product Data Sheets at usgboral.com

MATERIALS

- USG Boral Mineral Fibre Tile Ceilings comprise mineral fibre tiles laid into DONN® Brand Exposed Grid system.
- Echostop panels can be screw fixed to USG Boral Drywall Grid system or to Rondo Key-Lock concealed ceiling system.

INSTALLATION

Refer to the USG Boral and Rondo installation specifications on:

- USG Boral Drywall Grid system
- USG Boral DONN suspension system
- Rondo KEY-LOCK concealed ceiling system
- Rondo DUO Exposed grid ceiling systems
- Echostop Perforated Plasterboard.

OVER PARTITION CEILING SYSTEMS

Over partition performance of ceiling tiles is typically documented as a Ceiling Attenuation Class (CAC) value. More recently, this rating has been replaced by $D_{nc,w}$ – Weighted Suspended-ceiling Normalised Level Difference.

The solutions provided in the Over Partition Ceiling Systems tables are based on an extensive laboratory test program conducted at Acoustic Laboratories Australia Pty Ltd that comprised sixteen (16) configurations in total. Variables tested included:

- Differing heights of extended wall linings above the ceiling level
- Different ceiling types on one and both sides of the dividing wall
- With and without above ceiling treatments
- Effect of ceiling penetrations.

The following key findings were made as a result of the testing program:

- No acoustical benefit whether the wall linings extend 100mm above the ceiling as opposed to a nominal distance of 20mm
- Penetrations such as standard light troffers both sides of the dividing wall do not degrade the $D_{nc,w}$ of the ceiling (other types of ceiling penetrations will need to be assessed by a suitably qualified Acoustical Engineer).



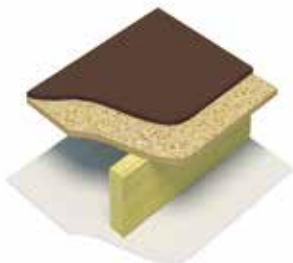
Figure G11: Echostop Ceiling

CEILING UNDER TIMBER FLOOR

$R_w+C_{tr} \geq 50$
 $L_{n,w}+C_l \leq 62$

CT.1

NON-FIRE RATED



SYSTEM DESCRIPTION

Floor Covering: Refer to table
Floor Structure: min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
Insulation: Refer to table
Ceiling Lining: One or more layers of non-fire resistant pbd
Ceiling Fixing: Direct fixed to ceiling joists

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14							
SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_l$
CT.1A	1x10mm SHEETROCK BRAND CEILING BOARD	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	Nil	41	34	84
				R2.5 GW Ceiling Batts	42	39	73
			Carpet + Foam Underlay	Nil	41	34	60
				R2.5 GW Ceiling Batts	42	39	55
CT.1B	1x13mm SHEETROCK BRAND STANDARD	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	Nil	41	35	83
				R2.5 GW Ceiling Batts	41	38	73
			Carpet + Foam Underlay	Nil	41	35	60
				R2.5 GW Ceiling Batts	41	38	55
CT.1C	1x10mm UNISPAN	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	Nil	42	36	83
				R2.5 GW Ceiling Batts	43	40	72
			Carpet + Foam Underlay	Nil	42	36	60
				R2.5 GW Ceiling Batts	43	40	55
CT.1D	1x13mm REGULAR	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	Nil	42	36	82
				R2.5 GW Ceiling Batts	42	39	73
			Carpet + Foam Underlay	Nil	42	36	60
				R2.5 GW Ceiling Batts	42	39	55
CT.1E	1x10mm SOUNDSTOP	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	Nil	43	37	82
				R2.5 GW Ceiling Batts	43	40	72
			Carpet + Foam Underlay	Nil	43	37	60
				R2.5 GW Ceiling Batts	43	40	55
CT.1F	2x10mm SOUNDSTOP	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	Nil	46	40	77
				R2.5 GW Ceiling Batts	45	42	72
			Carpet + Foam Underlay	Nil	46	40	60
				R2.5 GW Ceiling Batts	45	42	55

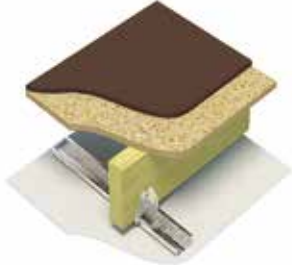
* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

CEILING UNDER TIMBER FLOOR

$R_w + C_{tr} \geq 50$
 $L_{n,w} + C_i \leq 62$

CT.2

NON-FIRE RATED



SYSTEM DESCRIPTION

Floor Covering: Refer to table
Floor Structure: Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
Insulation: Refer to table
Ceiling Lining: One or more layers of non-fire resistant pbd
Ceiling Fixing: On furring channels @ 600mm ctrs

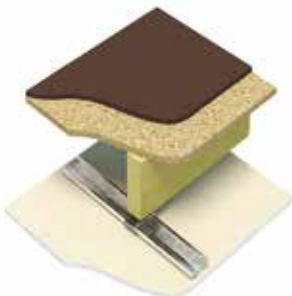
ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	$R_w + C_{tr}$	$L_{n,w} + C_i$
CT.2A	1x10mm SHEETROCK BRAND CEILING BOARD	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	Nil	42	35	79
				R2.5 GW Ceiling Batts	44	41	68
			Carpet + Foam Underlay	Nil	42	35	58
				R2.5 GW Ceiling Batts	44	41	53
CT.2B	1x13mm SHEETROCK BRAND STANDARD	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	Nil	42	36	78
				R2.5 GW Ceiling Batts	44	41	68
			Carpet + Foam Underlay	Nil	42	36	58
				R2.5 GW Ceiling Batts	44	41	53
CT.2C	1x10mm UNISPAN	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	Nil	43	36	76
				R2.5 GW Ceiling Batts	45	42	67
			Carpet + Foam Underlay	Nil	43	36	58
				R2.5 GW Ceiling Batts	45	42	53
CT.2D	1x13mm REGULAR	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	Nil	43	37	77
				R2.5 GW Ceiling Batts	44	41	67
			Carpet + Foam Underlay	Nil	43	37	58
				R2.5 GW Ceiling Batts	44	41	53
CT.2E	1x13mm SOUNDSTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	Nil	44	38	75
				R2.5 GW Ceiling Batts	46	43	67
			Carpet + Foam Underlay	Nil	44	38	58
				R2.5 GW Ceiling Batts	46	43	53
CT.2F	2x13mm SOUNDSTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	Nil	47	42	72
				R2.5 GW Ceiling Batts	48	45	67
			Carpet + Foam Underlay	Nil	47	42	58
				R2.5 GW Ceiling Batts	48	45	53

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

CT.3

NON-FIRE RATED



SYSTEM DESCRIPTION

Floor Covering: Refer to table
Floor Structure: min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
Insulation: Refer to table
Ceiling Lining: One or more layers of non-fire resistant pbd
Ceiling Fixing: Furred with Rondo STWC Sound Isolation Mounts

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	$R_w + C_{tr}$	$L_{n,w} + C_i$
CT.3A	1x13mm SOUNDSTOP	Furred on Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	Nil	51	42	70
				R2.5 GW Ceiling Batts	53	47	65

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

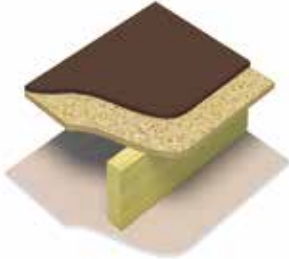
CEILING UNDER TIMBER FLOOR

$R_w+C_{tr} \geq 50$
 $L_{n,w}+C_l \leq 62$

CT30.1

FIRE RESISTANCE LEVEL
30/30/30
 FROM BELOW
 Fire Protective Covering

FRL Basis: FCO-1658



Direct fixed system shown

SYSTEM DESCRIPTION

Floor Covering: Refer to table
Floor Structure: Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
Insulation: Refer to table
Ceiling Lining: 1x13mm fire resistant pbd
Ceiling Fixing: Refer to table

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

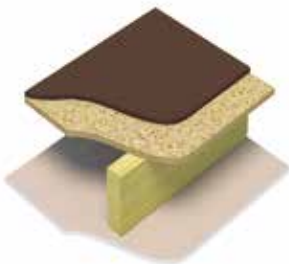
SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_l$
CT30.1A	1x13mm FIRESTOP	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	43	40	70
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	43	40	51
CT30.1B	1x13mm FIRESTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	45	42	65
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	45	42	49
CT30.1C	1x13mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	R3.0 GW Ceiling Batts	52	46	64

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation
 R3.0 GW Ceiling Batt - R3.0 Pink Ceiling Batts* glasswool by Fletcher Insulation

CT30.2

FIRE RESISTANCE LEVEL
30/30/30
 FROM BELOW
 RISF 30min

FRL Basis: FCO-1658, FCO-0568



Direct fixed system shown

SYSTEM DESCRIPTION

Floor Covering: Refer to table
Floor Structure: Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
Insulation: Refer to table
Ceiling Lining: 1x16mm fire resistant pbd
Ceiling Fixing: Refer to table

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_l$
CT30.2A	1x16mm FIRESTOP	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	43	40	70
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	43	40	51
CT30.2B	1x16mm FIRESTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	45	42	65
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	45	42	49
CT30.2C	1x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	R3.0 GW Ceiling Batts	52	46	64

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation
 R3.0 GW Ceiling Batt - R3.0 Pink Ceiling Batts* glasswool by Fletcher Insulation

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER TIMBER FLOOR

$R_w+C_{tr} \geq 50$
 $L_{n,w}+C_i \leq 62$

CT60.1

FIRE RESISTANCE LEVEL
60/60/60
 FROM BELOW
 RISF 30min

FRL Basis: FCO-1658



Furred system shown

SYSTEM DESCRIPTION

- Floor Covering:** Refer to table
- Floor Structure:** Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
- Insulation:** Refer to table
- Ceiling Lining:** 2x13mm fire resistant pbd
- Ceiling Fixing:** Refer to table

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_i$
CT60.1A	2x13mm FIRESTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²) + min 4.5mm Acoustic Underlay [†]	R2.5 GW Ceiling Batts	58	50	52
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	56	50	38
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²) + min 4.5mm Acoustic Underlay [†]	R2.5 GW Ceiling Batts	60	52	57
CT60.1B	2x13mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	R3.0 GW Ceiling Batts	58	52	62
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²)	R3.0 GW Ceiling Batts	58	50	62
CT60.1C	2x13mm FIRESTOP	Furred @ 600mm ctrs with Embelton Acoustic Mounts	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	58	52	57
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²)	R2.5 GW Ceiling Batts	58	50	58

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation
 R3.0 GW Ceiling Batt - R3.0 Pink Ceiling Batts* glasswool by Fletcher Insulation
[†] 4.5mm Acoustic Underlay - Regupol 4515 acoustic underlay or equivalent.

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

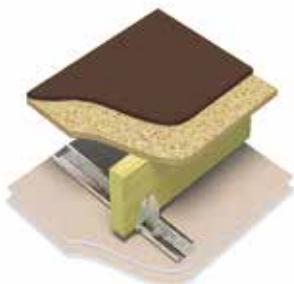
CEILING UNDER TIMBER FLOOR

$R_w+C_{tr} \geq 50$
 $L_{n,w}+C_l \leq 62$

CT60.2

FIRE RESISTANCE LEVEL
60/60/60
 FROM BELOW
 RISF 60min

FRL Basis: FCO-1658



Furred system shown

SYSTEM DESCRIPTION

- Floor Covering:** Refer to table
- Floor Structure:** Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
- Insulation:** Refer to table
- Ceiling Lining:** 1x13mm fire resistant pbd + 1x16mm fire resistant pbd
- Ceiling Fixing:** Refer to table

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14							
SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_l$
CT60.2A	1x13mm FIRESTOP + 1x16mm FIRESTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²) + min 4.5mm Acoustic Underlay [†]	R2.5 GW Ceiling Batts	60	52	52
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	56	50	38
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²) + min 4.5mm Acoustic Underlay [†]	R2.5 GW Ceiling Batts	61	53	57
CT60.2B	1x13mm FIRESTOP + 1x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	R3.0 GW Ceiling Batts	60	54	62
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²)	R3.0 GW Ceiling Batts	60	52	62
CT60.2C	1x13mm FIRESTOP + 1x16mm FIRESTOP	Furred @ 600mm ctrs with Embelton Acoustic Mounts	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	60	54	57
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²)	R2.5 GW Ceiling Batts	60	52	58

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts® glasswool by Fletcher Insulation
 R3.0 GW Ceiling Batt - R3.0 Pink Ceiling Batts® glasswool by Fletcher Insulation
[†] 4.5mm Acoustic Underlay - Regupol 4515 acoustic underlay or equivalent.

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER TIMBER FLOOR

R_w+C_{tr} ≥50
 L_{n,w}+C_l ≤62

CT90.1
FIRE RESISTANCE LEVEL
90/90/90
 FROM BELOW
 RISF 60min

FRL Basis: FCO-1658, FCO-0629



Furred system shown

SYSTEM DESCRIPTION

Floor Covering: Refer to table
Floor Structure: Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
Insulation: Refer to table
Ceiling Lining: 2x16mm fire resistant pbd
Ceiling Fixing: Refer to table

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R _w	R _w +C _{tr}	L _{n,w} +C _l
CT90.1A	2x16mm FIRESTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²) + min 4.5mm Acoustic Underlay [†]	R2.5 GW Ceiling Batts	61	52	52
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	57	50	38
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²) + min 4.5mm Acoustic Underlay [†]	R2.5 GW Ceiling Batts	62	54	57
CT90.1B	2x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	R3.0 GW Ceiling Batts	60	55	62
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²)	R3.0 GW Ceiling Batts	61	53	62
CT90.1C	2x16mm FIRESTOP	Furred @ 600mm ctrs with Embelton Acoustic Mounts	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	60	55	57
			Min 6mm Ceramic Floor Tiles + 6mm Cement Sheet or 10mm Fiberock (total mass min 15kg/m ²)	R2.5 GW Ceiling Batts	61	53	58

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation
 R3.0 GW Ceiling Batt - R3.0 Pink Ceiling Batts* glasswool by Fletcher Insulation
[†] 4.5mm Acoustic Underlay - Regupol 4515 acoustic underlay or equivalent.

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

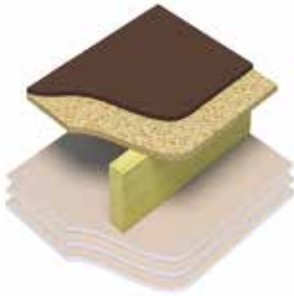
CEILING UNDER TIMBER FLOOR

$R_w+C_{tr} \geq 50$
 $L_{n,w}+C_l \leq 62$

CT120.1

FIRE RESISTANCE LEVEL
120/120/120
 FROM BELOW
 RISF 90min

FRL Basis: SI 1891, FTO-0029, FCO-1658



Direct fixed system shown

SYSTEM DESCRIPTION

- Floor Covering:** Refer to table
- Floor Structure:** Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
- Insulation:** Refer to table
- Ceiling Lining:** 2x16mm fire resistant pbd
- Ceiling Fixing:** Refer to table

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

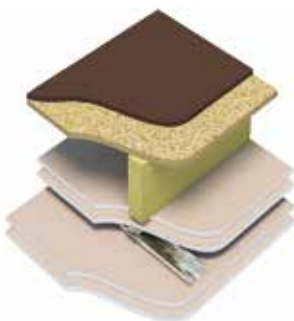
SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_l$
CT120.1A	3x16mm FIRESTOP	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	47	44	69
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	47	44	50
CT120.1B	3x16mm FIRESTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	49	47	63
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	49	47	48
CT120.1C	3x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	R3.0 GW Ceiling Batts	60	53	59

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation
 R3.0 GW Ceiling Batt - R3.0 Pink Ceiling Batts* glasswool by Fletcher Insulation

CT120.2

FIRE RESISTANCE LEVEL
120/120/120
 FROM BELOW
 RISF 120min

FRL Basis: FCO-1856



Direct fixed system shown

SYSTEM DESCRIPTION

- Floor Covering:** Refer to table
- Floor Structure:** Min 19mm particleboard flooring on 240mm deep joists @ 450mm ctrs
- Insulation:** Refer to table
- Ceiling Lining:** 2x16mm fire resistant pbd + furring channel + 2x16mm fire resistant pbd
- Ceiling Fixing:** Refer to table

ACOUSTIC RATINGS BASIS: RT&A TE405-05F14

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_l$
CT120.2A	2x16mm FIRESTOP + furring channel + 2x16mm FIRESTOP	Direct Fixed	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	56	51	61
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	56	51	48
CT120.2B	2x16mm FIRESTOP + furring channel + 2x16mm FIRESTOP	Furred @ 600mm ctrs	Timber Flooring (min 8.5kg/m ²)	R2.5 GW Ceiling Batts	58	53	51
			Carpet + Foam Underlay	R2.5 GW Ceiling Batts	58	53	46
CT120.2C	2x16mm FIRESTOP + furring channel + 2x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber Flooring (min 8.5kg/m ²)	R3.0 GW Ceiling Batts	60	54	55

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation
 R3.0 GW Ceiling Batt - R3.0 Pink Ceiling Batts* glasswool by Fletcher Insulation

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER CONCRETE FLOOR

R_w+C_{tr} ≥50
 L_{n,w}+C_l ≤62

CC.1

FIRE RESISTANCE LEVEL
 (refer to slab FRL)



Bare concrete floor shown

SYSTEM DESCRIPTION

- Floor Covering:** Refer to table
- Floor Structure:** Concrete slab (refer to table)
- Insulation:** Refer to table
- Ceiling Lining:** One or more layers of non-fire resistant pbd
- Ceiling Fixing:** Furred @ 600mm ctrs (ceiling cavity refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-05F15

SYSTEM	CEILING LINING	FLOORING TYPE	CEILING CAVITY	SLAB THICKNESS	150mm			200mm		
				INSULATION*	R _w	R _w +C _{tr}	L _{n,w} +C _l	R _w	R _w +C _{tr}	L _{n,w} +C _l
CC.1A	1x13mm SHEETROCK BRAND STANDARD	Timber Flooring (min 8.5kg/m ²) + min 4.5mm Acoustic Underlay [†]	100	Nil	59	52	59	62	54	56
				50G11, 50P7	64	56	53	67	58	49
		Timber Flooring (min 8.5kg/m ²) + Foam Underlay [^]	50	Nil	56	48	64	60	51	61
				50G11, 50P7	60	53	60	64	56	57
		Timber Flooring (min 8.5kg/m ²) + Foam Underlay [^]	100	Nil	57	49	63	61	52	60
				50G11, 50P7	61	54	59	65	57	56
		Carpet + Foam Underlay	50	Nil	56	48	39	60	51	36
				50G11, 50P7	60	53	38	64	56	35
		Carpet + Foam Underlay	100	Nil	57	49	39	61	52	36
				50G11, 50P7	61	54	38	65	57	35
		Tiled Floor+ min 4.5mm Acoustic Underlay [†]	100	Nil	59	53	57	62	55	53
				50G11, 50P7	64	56	51	67	58	47
Tiled Floor + Flexible Adhesive [#]	50	Nil	56	48	65	60	51	62		
		50G11, 50P7	60	53	61	64	56	58		
	100	Nil	57	49	64	61	52	61		
		50G11, 50P7	61	54	60	65	57	57		
CC.1B	1x13mm REGULAR	Timber Flooring (min 8.5kg/m ²) + min 4.5mm Acoustic Underlay [†]	100	Nil	60	53	57	63	55	54
				50G11, 50P7	66	57	51	69	59	48
		Timber Flooring (min 8.5kg/m ²) + Foam Underlay [^]	50	Nil	57	48	64	61	51	61
				50G11, 50P7	61	53	60	65	56	57
		Timber Flooring (min 8.5kg/m ²) + Foam Underlay [^]	100	Nil	58	50	62	62	53	59
				50G11, 50P7	62	55	58	66	58	55
		Carpet + Foam Underlay	50	Nil	57	48	39	61	51	36
				50G11, 50P7	61	53	38	65	56	35
		Carpet + Foam Underlay	100	Nil	58	50	38	62	53	35
				50G11, 50P7	62	55	37	66	58	34
		Tiled Floor+ min 4.5mm Acoustic Underlay [†]	100	Nil	60	53	55	63	55	52
				50G11, 50P7	66	57	49	69	59	46
Tiled Floor + Flexible Adhesive [#]	50	Nil	57	48	65	61	51	62		
		50G11, 50P7	61	53	61	65	56	58		
	100	Nil	58	50	63	62	53	60		
		50G11, 50P7	62	55	59	66	58	56		

* 50G11 - 50mm Pink* Partition 11kg/m³ glasswool by Fletcher Insulation. 50P7 - 50mm Polyester Insulation 7kg/m³

† 4.5mm Acoustic Underlay - Regupol 4515 acoustic underlay or equivalent.

^ Foam underlay: Min 3mm Dunlop DB3 foam underlay or equivalent.

Flexible adhesive: Laticrete 335 Premium flexible adhesive or equivalent

Updated Dec 2015

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.

CEILING UNDER CONCRETE FLOOR

$R_w+C_{tr} \geq 50$
 $L_{n,w}+C_l \leq 62$

CC.3

FIRE RESISTANCE LEVEL
(refer to slab FRL)



Bare concrete floor shown

SYSTEM DESCRIPTION

- Floor Covering:** Refer to table
- Floor Structure:** Concrete slab (refer to table)
- Insulation:** Refer to table
- Ceiling Lining:** One or more layers of non-fire resistant pbd
- Ceiling Fixing:** Suspended (ceiling cavity refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-05F15

SYSTEM	CEILING LINING	FLOORING TYPE	CEILING CAVITY	SLAB THICKNESS	150mm			200mm		
				INSULATION*	R_w	R_w+C_{tr}	$L_{n,w}+C_l$	R_w	R_w+C_{tr}	$L_{n,w}+C_l$
CC.3A	1x13mm SHEETROCK BRAND STANDARD	Timber Flooring (min 8.5kg/m ²) + min 4.5mm Acoustic Underlay†	300	Nil	63	55	57	65	56	53
				50G11, 50P7	65	59	51	69	62	48
		Timber Flooring (min 8.5kg/m ²) + Foam Underlay^	200	Nil	59	52	61	63	55	58
				50G11, 50P7	63	57	57	67	60	54
			300	Nil	59	53	59	63	56	56
				50G11, 50P7	63	58	55	67	61	52
		Carpet + Foam Underlay	200	Nil	59	52	39	63	55	36
				50G11, 50P7	63	57	38	67	60	35
			300	Nil	59	53	38	63	56	35
				50G11, 50P7	63	58	37	67	61	34
		Tiled Floor + Flexible Adhesive#	200	Nil	59	52	62	63	55	59
				50G11, 50P7	63	57	58	67	60	55
300	Nil		59	53	60	63	56	57		
	50G11, 50P7		63	58	56	67	61	53		
CC.3B	1x13mm REGULAR	Timber Flooring (min 8.5kg/m ²) + min 4.5mm Acoustic Underlay†	300	Nil	64	56	56	66	57	52
				50G11, 50P7	66	60	50	70	63	47
		Timber Flooring (min 8.5kg/m ²) + Foam Underlay^	200	Nil	59	52	60	63	55	57
				50G11, 50P7	63	57	56	67	60	53
			300	Nil	60	54	58	64	57	55
				50G11, 50P7	64	59	54	68	62	51
		Carpet + Foam Underlay	200	Nil	59	51	38	63	55	35
				50G11, 50P7	63	57	37	67	60	34
			300	Nil	60	53	37	64	57	34
				50G11, 50P7	64	59	36	68	62	33
		Tiled Floor + Flexible Adhesive#	200	Nil	59	52	61	63	55	58
				50G11, 50P7	63	57	57	67	60	54
300	Nil		60	54	59	64	57	56		
	50G11, 50P7		64	59	55	68	62	52		

* 50G11 – 50mm Pink® Partition 11kg/m³ glasswool by Fletcher Insulation. 50P7 – 50mm Polyester Insulation 7kg/m³

† 4.5mm Acoustic Underlay – Regupol 4515 acoustic underlay or equivalent.

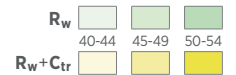
^ Foam underlay: Min 3mm Dunlop DB3 foam underlay or equivalent.

Flexible adhesive: Laticrete 335 Premium flexible adhesive or equivalent

Updated Dec 2015

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings – Introduction for maximum spans of Rondo 129 furring channel.

CEILINGS UNDER ROOF



CR.1

NON-FIRE RATED



Pitched roof shown

SYSTEM DESCRIPTION

- Roof Type:** Refer to table
- Insulation:** Refer to table
- Ceiling Lining:** One or more layers of non-fire resistant pbd (refer to table)
- Ceiling Fixing:** Direct fixed

ACOUSTIC RATINGS BASIS: RT&A TE405-05F16

SYSTEM	LINING	FIXING	ROOF TYPE	TILED PITCHED ROOF WITH SISALATION REFLECTIVE FOIL INSULATION		METAL PITCHED ROOF WITH PERMASTOP BUILDING BLANKET INSULATION		METAL FLAT ROOF WITH PERMASTOP BUILDING BLANKET INSULATION (190mm RAFTERS)	
				INSULATION*	R _w	R _w +C _{tr}	R _w	R _w +C _{tr}	R _w
CR.1A	1x10mm SHEETROCK BRAND CEILING BOARD	Direct fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling Batts	42	34	NA	NA	NA	NA
CR.1B	1x10mm UNISPAN	Direct fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling Batts	44	37	NA	NA	NA	NA
CR.1C	1x13mm SOUNDSTOP	Direct fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling Batts	48	41	NA	NA	NA	NA
CR.1D	2x10mm SHEETROCK BRAND CEILING BOARD	Direct fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling Batts	47	40	NA	NA	NA	NA
CR.1E	2x10mm UNISPAN	Direct fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling Batts	49	42	NA	NA	NA	NA
CR.1F	2x13mm SOUNDSTOP	Direct fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling Batts	54	47	NA	NA	NA	NA

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

CR.2

NON-FIRE RATED



Pitched roof shown

SYSTEM DESCRIPTION

- Roof Type:** Refer to table
- Insulation:** Refer to table
- Ceiling Lining:** One or more layers of non-fire resistant pbd (refer to table)
- Ceiling Fixing:** On furring channels @ 600mm ctrs (nom 30mm gap)

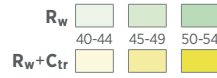
ACOUSTIC RATINGS BASIS: RT&A TE405-05F16

SYSTEM	LINING	FIXING	ROOF TYPE	TILED PITCHED ROOF WITH SISALATION REFLECTIVE FOIL INSULATION		METAL PITCHED ROOF WITH PERMASTOP BUILDING BLANKET INSULATION		METAL FLAT ROOF WITH PERMASTOP BUILDING BLANKET INSULATION (190mm RAFTERS)	
				INSULATION*	R _w	R _w +C _{tr}	R _w	R _w +C _{tr}	R _w
CR.2A	1x10mm SHEETROCK BRAND CEILING BOARD	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling Batts	43	36	42	34	40	32
CR.2B	1x10mm UNISPAN	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling Batts	45	38	44	36	42	34
CR.2C	1x13mm SOUNDSTOP	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling Batts	49	42	48	40	48	38
CR.2D	2x10mm SHEETROCK BRAND CEILING BOARD	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling Batts	48	41	47	39	45	37
CR.2E	2x10mm UNISPAN	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling Batts	50	43	49	41	47	39
CR.2F	2x13mm SOUNDSTOP	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling Batts	55	48	54	46	52	44

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

CEILINGS UNDER ROOF



CR.3

NON-FIRE RATED



Pitched roof shown

SYSTEM DESCRIPTION

- Roof Type:** Refer to table
- Insulation:** Refer to table
- Ceiling Lining:** One or more layers of non-fire resistant pbd (refer to table)
- Ceiling Fixing:** On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)

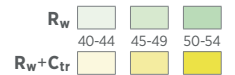
ACOUSTIC RATINGS BASIS: RT&A TE405-05F16

SYSTEM	LINING	FIXING	ROOF TYPE	TILED PITCHED ROOF WITH SISALATION REFLECTIVE FOIL INSULATION		METAL PITCHED ROOF WITH PERMASTOP BUILDING BLANKET INSULATION		METAL FLAT ROOF WITH PERMASTOP BUILDING BLANKET INSULATION (190mm RAFTERS)	
				INSULATION*	R _w	R _w +C _{tr}	R _w	R _w +C _{tr}	R _w
CR.3A	1x10mm SHEETROCK BRAND CEILING BOARD	On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)	R2.5 GW Ceiling Batts	48	38	47	36	45	34
CR.3B	1x10mm UNISPAN	On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)	R2.5 GW Ceiling Batts	50	40	49	38	47	36
CR.3C	1x13mm SOUNDSTOP	On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)	R2.5 GW Ceiling Batts	54	44	53	42	51	40
CR.3D	2x10mm SHEETROCK BRAND CEILING BOARD	On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)	R2.5 GW Ceiling Batts	54	43	53	41	51	39
CR.3E	2x10mm UNISPAN	On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)	R2.5 GW Ceiling Batts	56	46	55	44	53	42

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

CEILINGS UNDER ROOF



CR.4
NON-FIRE RATED



Pitched roof shown

SYSTEM DESCRIPTION

- Roof Type:** Refer to table
- Insulation:** Refer to table
- Ceiling Lining:** One or more layers of non-fire resistant pbd (refer to table)
- Ceiling Fixing:** Suspended

ACOUSTIC RATINGS BASIS: RT&A TE405-05F16									
SYSTEM	LINING	FIXING	ROOF TYPE	TILED PITCHED ROOF WITH SISALATION REFLECTIVE FOIL INSULATION		METAL PITCHED ROOF WITH PERMASTOP BUILDING BLANKET INSULATION		METAL FLAT ROOF WITH PERMASTOP BUILDING BLANKET INSULATION (190mm RAFTERS)	
				INSULATION*	R _w	R _w +C _{tr}	R _w	R _w +C _{tr}	R _w
CR.4A	1x10mm SHEETROCK BRAND CEILING BOARD	Suspended	R2.5 GW Ceiling Batts	NA	NA	47	37	45	35
CR.4B	1x10mm UNISPAN	Suspended	R2.5 GW Ceiling Batts	NA	NA	49	39	47	37
CR.4C	1x13mm SOUNDSTOP	Suspended	R2.5 GW Ceiling Batts	NA	NA	53	43	51	41
CR.4D	2x10mm SHEETROCK BRAND CEILING BOARD	Suspended	R2.5 GW Ceiling Batts	NA	NA	52	42	50	40
CR.4E	2x10mm UNISPAN	Suspended	R2.5 GW Ceiling Batts	NA	NA	55	45	53	43
CR.4F	2x13mm SOUNDSTOP	Suspended	R2.5 GW Ceiling Batts	NA	NA	59	49	57	47

CR.4C acoustic ratings updated 01Sep15

CR.4F acoustic ratings updated 01Sep15

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

CR.5
NON-FIRE RATED



Pitched roof shown

SYSTEM DESCRIPTION

- Roof Type:** Refer to table
- Insulation:** Refer to table
- Ceiling Lining:** One or more layers of non-fire resistant pbd (refer to table)
- Ceiling Fixing:** Suspended with Rondo STSU Sound Isolation Hangers

ACOUSTIC RATINGS BASIS: RT&A TE405-05F16									
SYSTEM	LINING	FIXING	ROOF TYPE	TILED PITCHED ROOF WITH SISALATION REFLECTIVE FOIL INSULATION		METAL PITCHED ROOF WITH PERMASTOP BUILDING BLANKET INSULATION		METAL FLAT ROOF WITH PERMASTOP BUILDING BLANKET INSULATION (190mm RAFTERS)	
				INSULATION*	R _w	R _w +C _{tr}	R _w	R _w +C _{tr}	R _w
CR.5A	1x10mm SHEETROCK BRAND CEILING BOARD	Suspended with Rondo Sound Isolation Hangers	R2.5 GW Ceiling Batts	NA	NA	50	39	48	37
CR.5B	1x10mm UNISPAN	Suspended with Rondo Sound Isolation Hangers	R2.5 GW Ceiling Batts	NA	NA	52	41	50	39
CR.5C	1x13mm SOUNDSTOP	Suspended with Rondo Sound Isolation Hangers	R2.5 GW Ceiling Batts	NA	NA	56	45	54	43
CR.5D	2x10mm SHEETROCK BRAND CEILING BOARD	Suspended with Rondo Sound Isolation Hangers	R2.5 GW Ceiling Batts	NA	NA	55	44	53	42
CR.5E	2x10mm UNISPAN	Suspended with Rondo Sound Isolation Hangers	R2.5 GW Ceiling Batts	NA	NA	58	47	56	45

* R2.5 GW Ceiling Batt - R2.5 Pink Ceiling Batts* glasswool by Fletcher Insulation

For the full range of USG Boral systems refer to usgboral.com/eselector
 Refer to Table G2 in Ceilings - Introduction for maximum spans of Rondo 129 furring channel.
 Refer to Table G3 in Ceilings - Introduction for maximum spans and spacings of furring channels with acoustic mounts.

CEILINGS UNDER ROOF - FIRE UPGRADE

CR

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FCO-1658, FCO-0568, SI 1891, FTO-0029, FCO-1856



Pitched roof shown

SYSTEM DESCRIPTION

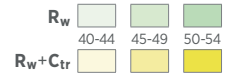
Roof Type: Any
Ceiling Lining: One or more layers of fire resistant pbd (refer to table)
Ceiling Fixing: Any

FIRE RATINGS

SYSTEM	FIRE RESISTANT LEVEL	RISF	LINING
CR30.1A	30/30/30 from below	NA	1x13mm FIRESTOP
CR30.2A	30/30/30 from below	30min	1x16mm FIRESTOP
CR60.1A	60/60/60 from below	30min	2x13mm FIRESTOP
CR60.2A	60/60/60 from below	60min	1x13mm FIRESTOP + 1x16mm FIRESTOP
CR90.1A	90/90/90 from below	60min	2x16mm FIRESTOP
CR120.1A	120/120/120 from below	90min	3x16mm FIRESTOP
CR120.2A	120/120/120 from below	120min	2x16mm FIRESTOP + Furring +2x16mm FIRESTOP

For the full range of USG Boral systems refer to usgboral.com/eselector

SPANNING CEILINGS C-SECTION



CS

FIRE RESISTANCE LEVEL (refer to table)

FRL Basis: FCO-1160, FCO-1161, FCO-1162, FCO-1213, FCO-0411



System CS60.1A shown

SYSTEM DESCRIPTION

- Top Lining:** One or more layers of fire resistant pbd
- Framing:** 150mm C-studs
0.75mm BMT
@ 600mm ctrs
- Bottom Lining:** One or more layers of fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405-05F17

SYSTEM	FRL	TOP LINING	BOTTOM LINING	STUD SIZE mm	150		MAX SPANS FOR POINT LOAD AT MIDSPAN [†] mm	
				BMT mm	0.75			
				INSULATION*	R _w	R _w +C _{tr}	1400N	900N
CS60.1A	60/60/60 from above only	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil	39	33	2000	3000
				90G11, 90P14	46	42		
CS90.1A	90/90/90 from above only	2x13mm FIRESTOP	1x13mm FIRESTOP	Nil	40	31	2000	2900
				90G11, 90P14	49	40		
CS120.1A	120/120/120 from above only	2x16mm FIRESTOP	1x16mm FIRESTOP + 1x10mm REGULAR	Nil	46	38	1900	2650
				90G11, 90P14	52	47		
CS120.1B	120/120/120 from above 60/60/60 from below	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil	47	38	1900	2650
				90G11, 90P14	52	47		
CS120.1C	120/120/120 from both sides	2x16mm FIRESTOP	3x16mm FIRESTOP	Nil	49	41	1850	2500
				90G11, 90P14	54	50		
CS180.1A	180/180/180 from above only	2x25mm SHAFTLINER	1x16mm FIRESTOP	Nil	48	40	1900	2600
				90G11, 90P14	54	50		

* 90G11 - 90mm Pink® Partition 11kg/m³ glasswool by Fletcher Insulation. 90P14 - 90mm Polyester Insulation 14kg/m³

† Maximum spans are based on non trafficable ceilings in accordance with AS 1170.1 cl 3.5.2. End connections using Rondo SWC3 or 201 web cleats.

SPANNING CEILINGS CH-SECTION

R _w	40-44	45-49	50-54
R _w +C _{tr}			

CH

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FCO-0672, FCO-0410, FCO-1658, FCO-2212



System CH120.1A shown

SYSTEM DESCRIPTION

- Top Lining:** One or more layers of fire resistant pbd
- Framing:** CH-studs @ 600mm ctrs (refer to table)
- Bottom Lining:** One or more layers of fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405-05F17												
SYSTEM	FRL	TOP LINING	BOTTOM LINING	STUD SIZE mm	64		102		64		102	
				BMT mm	0.55	0.90	0.55	0.90	0.55	0.90	0.55	0.90
				INSULATION*	R _w				R _w +C _{tr}			
CH60.1A	60/60/60 from both sides	1x25mm SHAFTLINER	2x16mm FIRESTOP	Nil	43	40	45	42	34	31	36	33
				50G11, 50P14	50	47	51	48	40	37	42	39
CH120.1A	120/120/120 from both sides	1x25mm SHAFTLINER	3x16mm FIRESTOP	Nil	45	42	46	43	36	33	37	34
				50G11, 50P14	52	49	52	49	42	39	43	40
CH120.2A	120/120/120 from both sides	3x16mm FIRESTOP	1x25mm SHAFTLINER	Nil	45	42	46	43	36	33	37	34
				50G11, 50P14	52	49	52	49	42	39	43	40

* 50G11 - 50mm Pink® Partition 11kg/m³ glasswool by Fletcher Insulation. 50P14 - 50mm Polyester Insulation 14kg/m³

MAXIMUM SPANS								
STUD SIZE mm	64	64	102	102	64	64	102	102
BMT mm	0.55	0.90	0.55	0.90	0.55	0.90	0.55	0.90
FRAME SPACING	0.00kPa PRESSURE				0.25kPa PRESSURE			
300	2000	2530	2690	3410	2000	2530	2690	3410
600	1760	2200	2360	2960	1480	1850	1980	2500

- Maximum spans are based on:
- 600Pa self weight
 - Maximum working stress of steel of 80MPa under fire load
 - Non trafficable ceilings and no additional loadings from construction or maintenance personnel
 - Simply supported, laterally restrained joists.

For the full range of USG Boral systems refer to usgboral.com/eselector

ACOUSTIC CEILINGS – MINERAL FIBRE TILES

APPLICATION GUIDELINES		APPLICATION																							
PANEL	FACE TEXTURE	AIRPORTS	BANKS	BOARDROOMS / CONFERENCE	CINEMAS / THEATRES	COMPUTER ROOMS	FACTORIES / WORKSHOPS	FOODHALLS	GYMNASIUMS	HOSPITALS / MEDICAL CENTRES	LABORATORIES / CLEANROOMS	LIBRARIES	LIGHT INDUSTRIAL CONSTRUCTION	LOBBIES / RECEPTIONS	OFFICES	OPEN PLAN OFFICES	RESTAURANTS / CAFES	RETAIL	SCHOOLS	SERVICE STATIONS	SHOPPING CENTRES	SHOWROOMS / EXHIBITION AREAS	SWIMMING POOLS	WASHROOMS	FIRE RATED
		CLEAN ROOM CP CLASS 10M-100M (PERF)	F					•	•	•	•	•	•	•			•		•	•	•	•	•		•
ECLIPSE CLIMAPLUS	M	•	•	•	•					•		•										•	•		
EUROCOUSTIC MINERVAL LUX	M	•	•	•	•	•		•		•		•		•	•	•	•	•	•	•	•	•			
EUROCOUSTIC TONGA	M	•	•	•	•	•		•		•		•		•	•	•	•	•	•	•	•	•			
HALCYON CLIMAPLUS	M	•	•	•	•	•		•		•		•		•	•	•	•	•	•	•	•	•			
IMPRESSIONS CLIMAPLUS	F	•	•	•	•					•		•	•									•	•		
MARS CLIMAPLUS	F	•	•	•	•	•		•		•	•	•										•	•		
MARS CLEANROOM CP	F					•	•			•	•									•			•	•	
MARS CP HEALTHCARE	F					•		•		•	•						•		•					•	
MARS CLIMAPLUS HIGH NRC	F	•	•	•	•			•		•		•		•	•	•	•	•	•	•	•	•			
MILLENNIA CLIMAPLUS	F	•	•	•	•			•		•		•										•	•		
OLYMPIA MICRO CLIMAPLUS	F	•	•	•	•					•		•	•	•	•							•	•		
OLYMPIA 11 MICRO CLIMAPLUS 0.65	F	•	•	•	•					•		•	•	•	•		•	•	•			•	•		
RADAR CERAMIC CLIMAPLUS	M																			•			•	•	•
RADAR CLIMAPLUS	M	•	•	•	•																				•
RADAR CLIMAPLUS ILLUSIONS	M	•	•	•	•																				
RADAR CLIMAPLUS HIGH NRC	M	•	•	•	•					•							•	•	•			•	•		•
RADAR CLIMAPLUS HIGH NRC/CAC	M	•	•	•	•			•		•		•	•	•	•	•	•	•	•			•	•		•
ROCK FACE CLIMAPLUS	M	•	•						•	•		•						•	•		•				•

ACOUSTIC CEILINGS – MINERAL FIBRE TILES

TECHNICAL DATA										
PANEL	EDGE	CEILING GRID	NRC	CAC RANGE	LR	VOC EMISSIONS	ANTI-MOULD & MILDEW	RECYCLED CONTENTS	PANEL WEIGHT kg/m ²	PANEL COST CATEGORY
CLEAN ROOM CLIMAPLUS CLASS 100	SQ	DX	—	35-39	0.79	—	—	51%	5.4	\$\$\$\$
CLEAN ROOM CP CLASS 10M-100M	SQ	DX	0.55-0.65	35-39	0.79	—	—	51%	5.4	\$\$\$\$
ECLIPSE CLIMAPLUS	SQ SLT FL	DX/DXT	0.70-0.75	35-39	0.86	Low	●	77%	4.7	\$\$\$
EUROCOUSTIC MINERVAL LUX	SQ SLT FL	DX/DXT	0.90	—	0.75	0.05mg/m ³	○	50%	1.9	\$\$\$
EUROCOUSTIC TONGA	SQ SLT FL	DX/DXT	0.95	—	0.75	0.05mg/m ³	○	50%	2.2	\$\$\$\$
HALCYON CLIMAPLUS	SQ SLT FLB	DX/DXT	0.90-1.00	20-30	0.88	Zero	○	35.1%	1.85-3.3	\$\$\$\$
IMPRESSIONS CLIMAPLUS	SQ SLT FLB	DX/DXT	0.50-0.60	35-39	0.84	Low	●	44%	3.0	\$
MARS CLIMAPLUS	SQ SLT FLB	DX/DXT	0.70 0.85	35-39	0.90	Low	●	76%	4.7	\$\$\$\$
MARS CLEANROOM CP	—	—	0.70/0.85+	35-39	0.90	Low	●	76%	5.2	\$\$\$\$
MARS CLIMAPLUS HEALTHCARE	—	—	0.70/0.85+	35-39	0.90	Low	●	76%	5.2	\$\$\$\$
MARS CLIMAPLUS HIGH NRC	—	—	0.80/0.85+	35-39	0.90	Low	●	76%	5.9	\$\$\$\$
MILLENNIA CLIMAPLUS	SQ SLT FLB	DX/DXT	0.70	35-39	0.85	Low	●	75%	5.0	\$\$\$
OLYMPIA MICRO CLIMAPLUS	SQ SLT FL	DX/DXT	0.50+	35-39	0.87	Low	●	52%	3.8	\$\$
OLYMPIA 11 MICRO CLIMAPLUS	SQ SLT FL	DX/DXT	0.65+	35-39	0.87	Low	●	56%	5.0	\$\$\$
RADAR CLIMAPLUS	SQ SLT FLB	DX/DXT	0.50-0.60	35-39	0.84	Low	●	28-44%	3.0	\$
RADAR CLIMAPLUS ILLUSIONS	SLT	DX/DXT	0.55-0.65	35-39	0.89	Low	●	44%	4.2	\$\$
RADAR CLIMAPLUS HIGH NRC	SQ/SLT	DX/DXT	0.70-0.75	35-39	0.84	Low	●	58%	5.8	\$\$\$
RADAR CLIMAPLUS HIGH NRC/CAC	SQ	DX/DXT	0.70+	40	0.84	Low	●	56%	5.8	\$\$\$
RADAR CERAMIC CLIMAPLUS	SQ	DX	0.50	42	0.82	Low	○	45%	8.0	\$\$\$\$
ROCK FACE CLIMAPLUS	SQ	DX	0.55	37-41	0.86	Low	●	49%	4.9	\$\$\$

Low Emissions (VOC Class)

Classified as low-emitting per standards established by the Collaborative for High-Performance Schools (CHPS), following California Specification 01350 testing methods. Low-emitting is defined as having less than 13.5 ppb/0.017 mg/m³.

Edge Profiles

- SQ Square Edge
- SL Shadowline
- SLT Shadowline Tapered
- FL Fineline
- FLB Fineline Bevel

● CLIMAPLUS Superior Performance

Contains a broad-spectrum antimicrobial treatment on the face and back of the panel that provides resistance against the growth of mould/mildew, fungi, yeast, and odour/ stain-causing Gram-positive and Gram-negative bacteria.

○ CLIMAPLUS Inherent Performance

Substrate is inherently resistant to the growth of mould, mildew and bacteria.

Panel Cost Category

- Economical \$
- Moderate \$\$
- Mid Range \$\$\$
- Premium \$\$\$\$

OVER PARTITION SYSTEMS

OVER PARTITION CEILING SYSTEMS					
WALL ACOUSTIC RATING	SYSTEM	ACCEPTABLE CEILING CONFIGURATION TO MAINTAIN WALL ACOUSTIC RATING			
		SIDE A	SIDE B	CONTINUOUS / DISCONTINUOUS CEILING	ABOVE CEILING TREATMENT
R_w ≤ 35	OP.1	Mineral Fibre Panels Group A, B or C	Mineral Fibre Panels Group A, B or C	Continuous or Discontinuous	None
	OP.2	13mm SHEETROCK Brand Standard	13mm SHEETROCK Brand Standard	Continuous or Discontinuous	None
R_w =40	OP.3	Mineral Fibre Panels Group A or B	Mineral Fibre Panels Group A or B	Discontinuous	13mm plasterboard wall lining on one side of stud only continued up to u/s of concrete slab or roof lining
	OP.4	Mineral Fibre Panels Group C	Mineral Fibre Panels Group C	Discontinuous	Total of 150G11* extend min 1200mm each side of wall
	OP.5	13mm Regular plasterboard ceiling	Mineral Fibre Panels Group A or B	Discontinuous	50G11* extend min 1200mm each side of wall
	OP.6	13mm Regular plasterboard ceiling	Mineral Fibre Panels Group C	Discontinuous	None
	OP.7	13mm Regular plasterboard ceiling	13mm Regular plasterboard ceiling	Continuous or Discontinuous	None
	OP.2	13mm SHEETROCK Brand Standard	13mm SHEETROCK Brand Standard	Continuous or Discontinuous	None
R_w =45	OP.8	Mineral Fibre Panels Group A, B or C	Mineral Fibre Panels Group A, B or C	Discontinuous	Plasterboard wall lining min. density 8.3 kg/m ² on one side of stud only continued up to u/s of concrete slab or roof lining + 50G11* extend min 1200mm each side of wall
	OP.9	13mm Regular plasterboard ceiling	13mm Regular plasterboard ceiling	Discontinuous	50G11* over entire ceiling both sides of wall
R_w =50	OP.10	13mm Regular plasterboard ceiling	13mm Regular plasterboard ceiling	Discontinuous	Plasterboard wall lining min. density 10.5 kg/m ² on both sides of stud to extend full height to u/s of concrete slab or roof lining

* 50G11 – 50mm Pink® Partition 11kg/m³ glasswool by Fletcher Insulation. 150G11 – 2x75mm or 3x50mm Pink® Partition 11kg/m³ glasswool by Fletcher Insulation.

- Notes:
- Refer to USG BORAL CEILING PANEL CLASSIFICATION table on p G29 for suitable ceiling panels
 - Acoustic ratings based on nom. 700mm plenum depth.
 - For continuous ceilings, junction of wall to suspended ceiling to be acoustically sealed.
 - For continuous or discontinuous ceilings, no acoustical treatment required to shadowline stopping angle at head of wall.
 - Other acceptable materials (ie. barium loaded vinyl) can be used in lieu of a plasterboard barrier in ceiling space.
 - Insulation blankets must not be in direct contact with mineral fibre panels and must be supported by the suspension system only
 - Insulation batts can be laid directly on mineral fibre panels only to the extent required in the above over partition systems and provided that the batts are the same size as the panels.

OVER PARTITION SYSTEMS

USG BORAL ACOUSTIC CEILING PANELS CLASSIFICATION				
CEILING PANEL GROUP	PRODUCT NAME	PANEL THICKNESS	NRC	CAC
GROUP A	RADAR CLIMAPLUS	15mm	0.50-0.60	33-35
	IMPRESSIONS CLIMAPLUS	15mm	0.50-0.60	33-35
	RADAR CLIMAPLUS HIGH-NRC	19mm	0.70	35
GROUP B	MARS CLIMAPLUS HEALTHCARE	19mm	0.70-0.80	35-39
	MARS CLEANROOM CP	19mm	0.70/0.85+	35-39
	MARS CLIMAPLUS HEALTHCARE	19mm	0.70/0.85+	35-39
	MARS CLIMAPLUS HIGH NRC	22mm	0.80/0.85+	35-39
	MILLENNIA CLIMAPLUS	19mm	0.70	35-39
	OLYMPIA MICRO CLIMAPLUS	15mm	0.50	35-39
	OLYMPIA 11 MICRO CLIMAPLUS	19mm	0.65	35-39
	ECLIPSE CLIMAPLUS	19mm	0.65-0.75	35-39
	ROCK FACE CLIMAPLUS	15mm	0.50-0.60	35-39
	CLEAN ROOM CLIMAPLUS	15mm	0.50-0.60	35-39
GROUP C	RADAR CLIMAPLUS HIGH-NRC, HIGH-CAC	19mm	0.70	40
	IMPRESSIONS CLIMAPLUS HIGH-CAC	15mm	0.60	40

OVER PARTITION SYSTEMS

TYPICAL LAYOUTS



Figure G12: Ceiling configuration to maintain an $R_w \leq 35$ wall acoustic rating (System OP.1 shown)

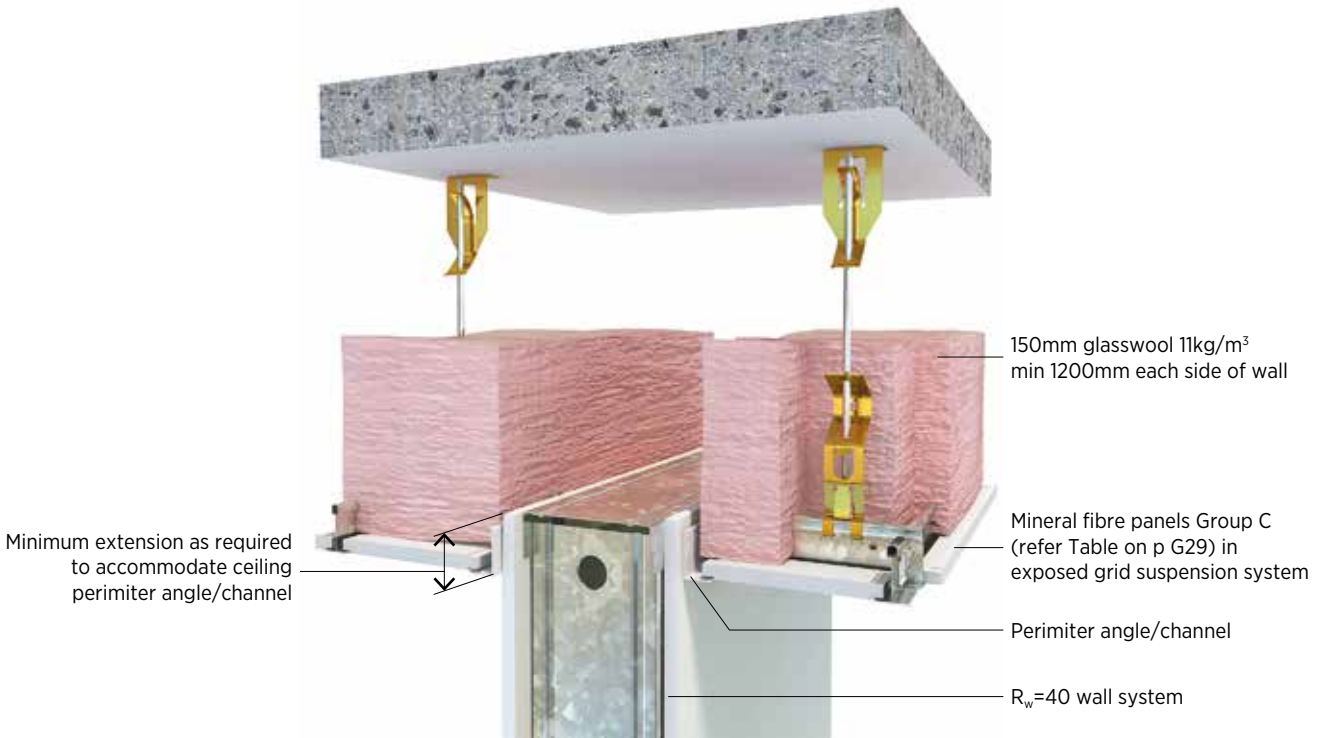


Figure G13: Ceiling configuration to maintain an $R_w = 40$ wall acoustic rating (System OP.4 shown)

OVER PARTITION SYSTEMS

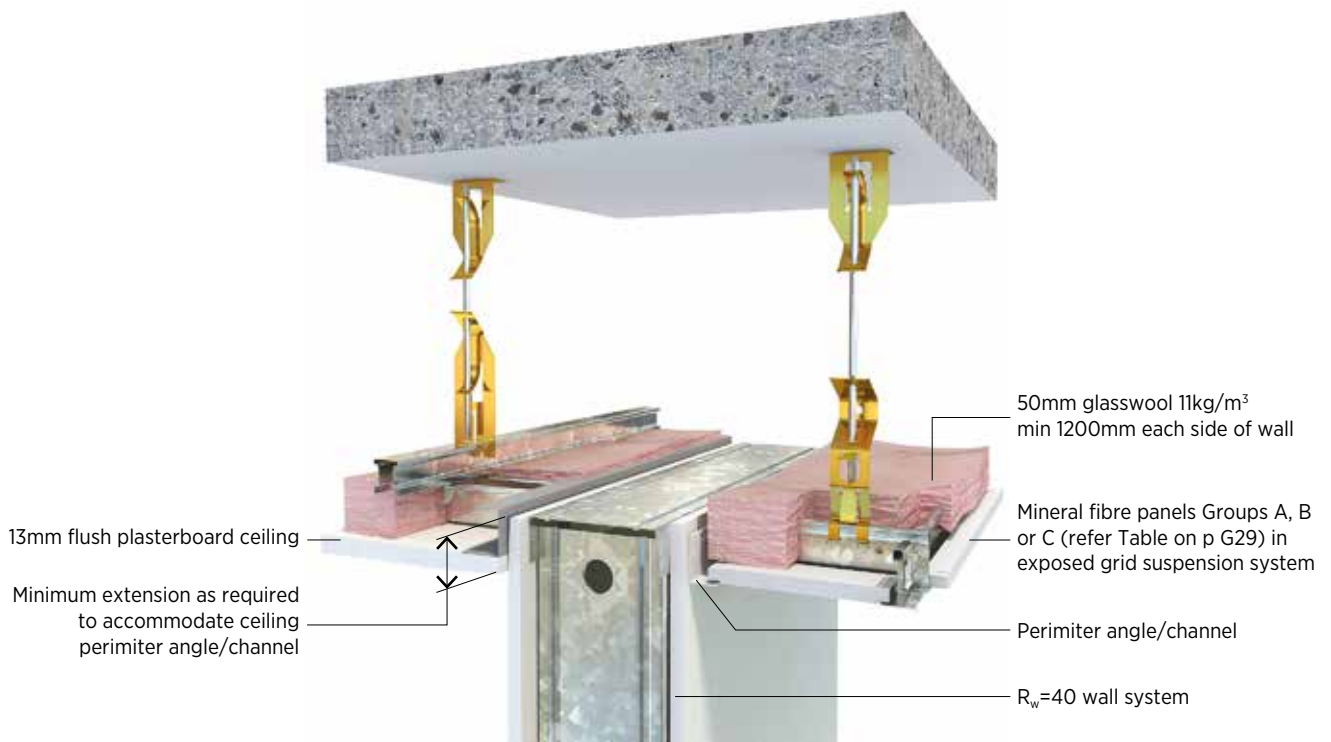


Figure G14: Ceiling configuration to maintain an $R_w=40$ wall acoustic rating (System OP.5 shown)

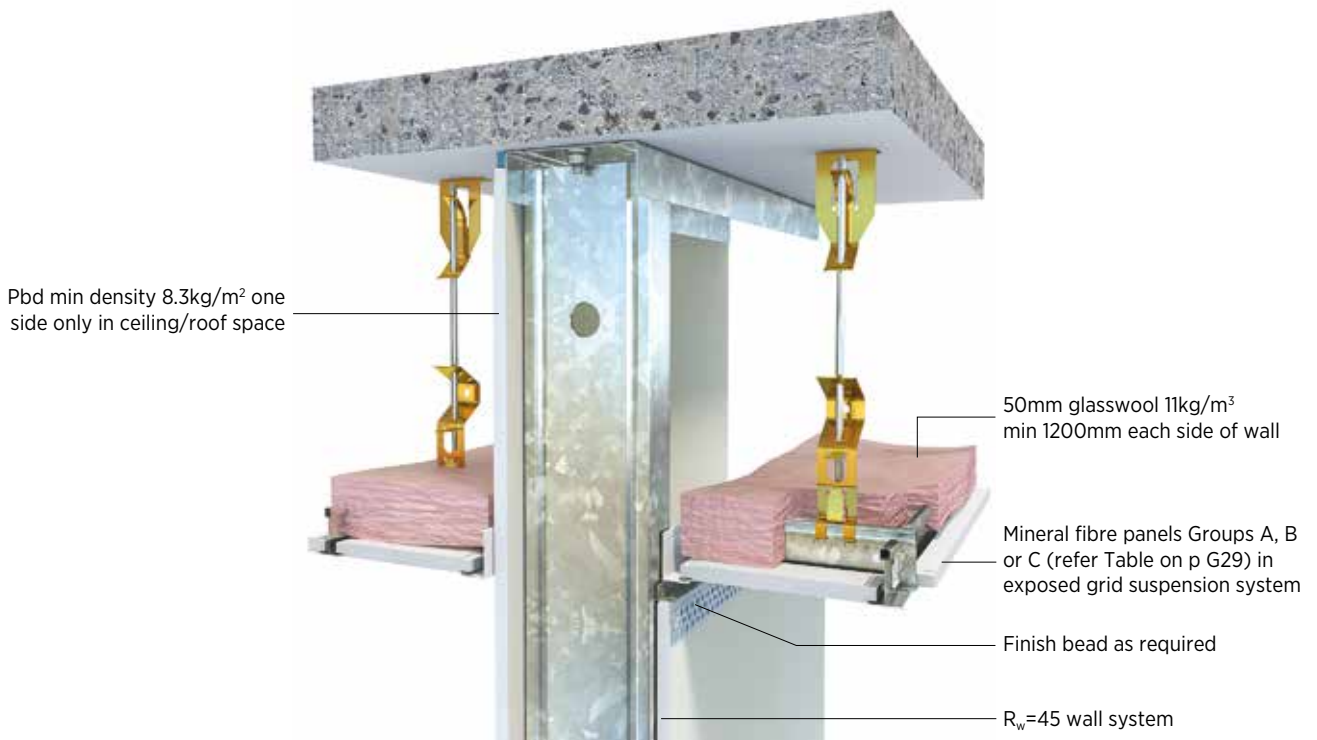


Figure G15: Ceiling configuration to maintain an $R_w=45$ wall acoustic rating (System OP.8 shown)

OVER PARTITION SYSTEMS

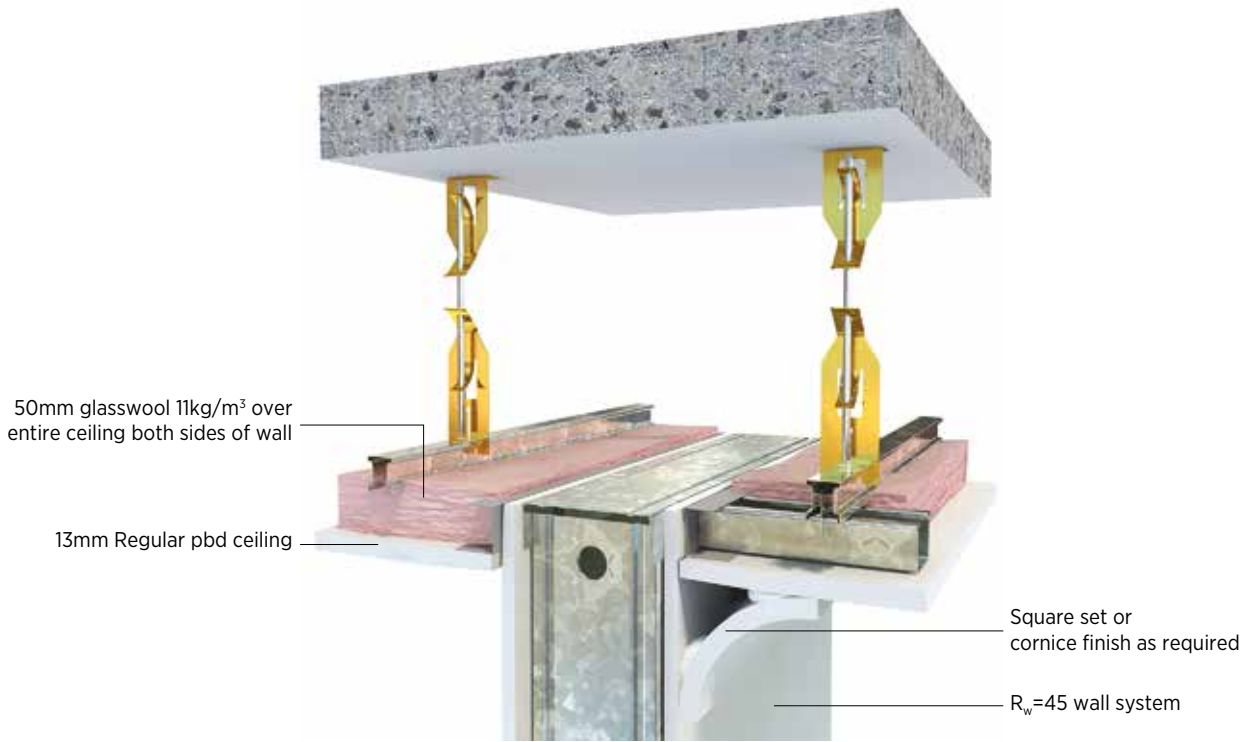


Figure G16: **Ceiling configuration to maintain an R_w=45 wall acoustic rating**
(System OP.9 shown)

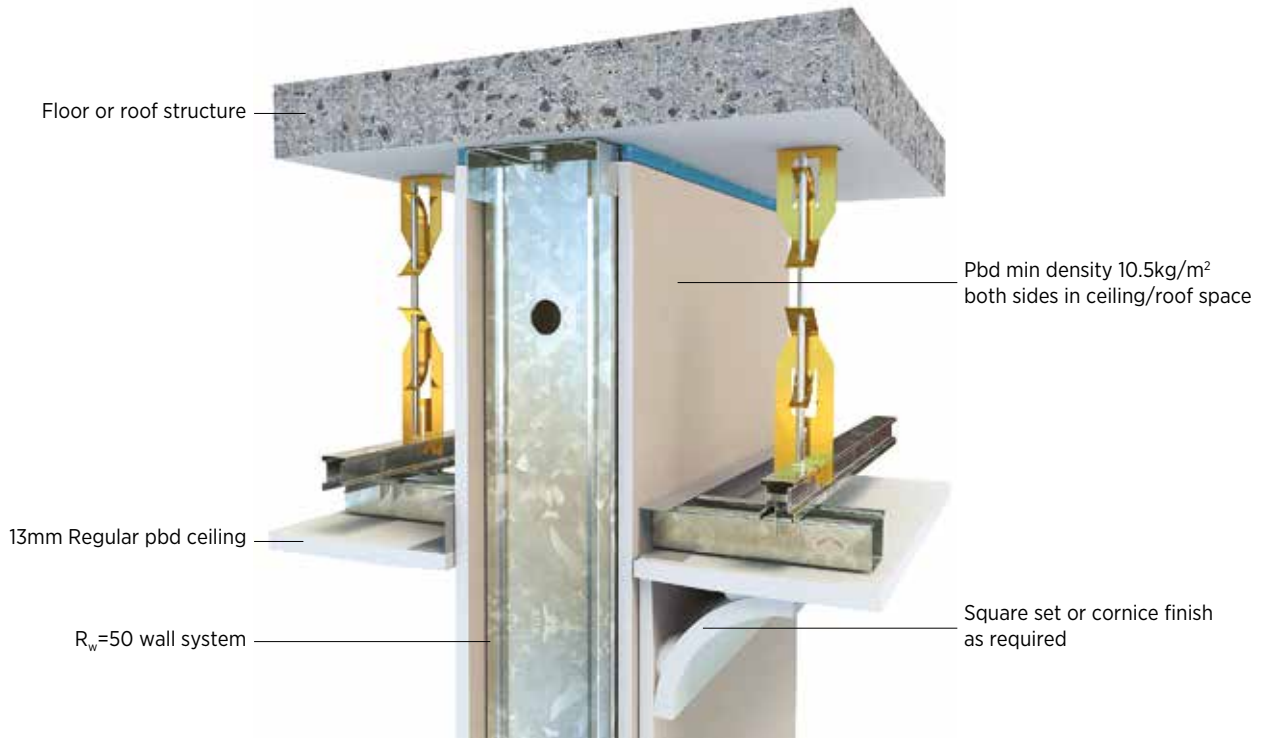


Figure G17: **Ceiling configuration to maintain an R_w=50 wall acoustic rating**
(System OP.10 shown)