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SYSTEMS+™

FIRE & ACOUSTIC SYSTEMS
NEW ZEALAND, VERSION 1

USG BORAL
INNOVATION INSPIRED BY YOU.

CONTENTS

GENERAL INFORMATION

INTRODUCTION

This manual is intended for use by architects, building designers, engineers, builders, certifiers, sub-contractors and plastering contractors dealing with fire-rated and acoustic construction. It provides fire-rating, acoustic and structural performance data and installation specifications for a wide range of USG Boral building systems, including lightweight wall and ceiling systems, masonry upgrades and beam/column fire protection systems.

In addition to the systems listed in this publication, USG Boral offers many other system configurations to suit specific project requirements.

SCOPE

This manual lists USG Boral fire-rated wall systems up to Fire Resistance Rating (FRR) –/240/240 and 180/180/180.

Fire-rated ceiling systems are available up to FRR 120/120/120 (from below) and beam/column fire protection systems up to FRR 180/–/– .

A wide range of acoustic systems is available to meet the New Zealand Building Code (NZBC) and other performance requirements. These include plasterboard wall and ceiling systems, and a range of USG Boral acoustic ceiling tiles up to Noise Reduction Coefficient (NRC) = 1.00

CERTIFICATION

USG Boral systems have been tested and assessed to ensure they meet the relevant requirements of New Zealand Standards and the NZBC.

FIRE RESISTANCE

Fire testing and assessment has been conducted in accordance with AS 1530.4 *Methods for fire tests on building materials, components and structures — Fire resistance test of elements of construction* and carried out by:

- Council for Scientific Industrial Research Organisation (CSIRO), Manufacturing and Infrastructure Technology, North Ryde, NSW, Australia
- Warrington Fire Research, Dandenong, Victoria, Australia
- BHP Research, Clayton, Victoria, Australia
- Building Research Association of New Zealand (BRANZ), Judgeford, New Zealand.

ACOUSTIC INSULATION

All acoustic ratings listed in this publication have been verified by acoustic consultants Renzo Tonin & Associates (RT&A) and are covered by the stated opinion number in each table. Acoustic ratings are based on similar tested systems.

STRUCTURAL

Structural testing of wall systems have been carried out at the National Association of Testing Authorities (NATA) – registered laboratories of USG Boral at Port Melbourne. Structural appraisal of the systems was carried out by Wynton Stone Australia Pty Ltd and Taylor Thomson Whitting of Melbourne.

Fire, acoustic and structural test reports and opinions can be accessed from USG Boral on request, subject to commercial sensitivity.

NOTES:

- Various system certifications are valid only when the relevant systems are constructed in accordance with USG Boral specifications and use the stated materials and components. Fastenings should be of the same type and at centres no greater than detailed for particular systems.
- While USG Boral systems are certified to achieve the stated fire-resistance and acoustic ratings, it is the responsibility of the relevant project consultant to ensure the selected systems satisfy project requirements.
- Acoustic ratings provided are based on laboratory tests carried out under ideal conditions. In-situ performance may vary from stated ratings due to flanking effects.

STANDARDS

The following Australasian and other Standards are referenced in this publication:

- AS/NZS 2588:1998 *Gypsum plasterboard*
- AS/NZS 2589:2017 *Gypsum linings – Application and finishing*
- NZS 3604:2011 *Timber-framed buildings*
- AS/NZS 1170.1:2002 *Structural Design Actions – Permanent, imposed and other actions*
- AS/NZS 1170.2:2011 *Structural Design Actions – Wind actions*
- NZS 1170.5:2004 *Structural Design Actions – Earthquake actions*
- AS 1397:2011 *Steel sheet and strip – Hot dipped, zinc coated or aluminium/zinc coated*
- AS 3566:2002 *Self-drilling screws for the building and construction industries*
- AS/NZS 1716:2012 *Respiratory protective devices*
- ISO 9001 *Quality systems – Model for quality assurance in production, installation and servicing*
- AS/NZS 4600:2018 *Cold-formed steel structures*
- AS 1530.4:2014 *Fire-resistance test of elements of construction*
- NASH *Residential and Low-rise Steel Framing*

PRELIMINARIES

NZBC COMPLIANCE

The following plasterboard types are used in various wall and ceiling systems detailed within this manual and comply with the following performance criteria of the NZBC:

- Firestop
- Multistop
- Soundstop
- Shaftliner
- Sheetrock
- Fiberock Aqua-Tough

PERFORMANCE CRITERIA	EVIDENCE
STRUCTURE B1.3.1 B1.3.2 B1.3.3 (a, b, c, f, j, l, o, r) B1.3.4 (a, b, c, e)	In respect of building element Manufactured in accordance with AS/NZS 2588:1998 Impact ASTM E695-75 Impact ASTM C1629 (Fiberock) Panel performance ASTM E72-80
DURABILITY B2.3.1 (a) B2.3.2	USG and Boral have a combined plasterboard manufacturing experience in excess of 145 years. During this time, USG Boral have supplied plasterboard, along with plasterboard wall and ceiling systems, for use within the residential and commercial sectors.
FIRE C3.4 (a)	Material Group No. 1-S BRANZ assessment FAR4435 BRANZ assessment FH5774 (Fiberock)
HAZARD F2.3.1	Manufactured in accordance with AS/NZS 2588:1998 ASTM C473 (Fiberock)
SOUND G6.3.1	TE405-05F13 TE405-20S01/2/3/4/5/6/8/9/10 SLR-FB-S-S-01 SLR-FB-S-SS-01 SLR-FB-S-DS-01 SLR-FB-T-01 SLR-FB-T-S-01 SLR-FB-T-SS-01 SLR-FB-T-DS-01 CSIRO Measurement No.TL429em (2004) CSIRO Measurement No.TL429qrs (2004) CSIRO Measurement No.TL469 (2006)

For additional details see individual plasterboard Product Technical Statements.

FIRE RESISTANCE RATINGS (FRRs)

To prevent fire spread or structural collapse, the NZBC Acceptable Solutions require building elements to have FRRs. The level of FRR required depends on the risk group of the building.

Fire resistance tests: The FRR of building elements are determined by the Standard tests specified in Appendix C/AS 5.1 of the NZBC Acceptable Solutions.

FRRs consist of three numbers, which give time values in minutes for structural adequacy, integrity and insulation. Primary and secondary elements required to have an FRR will, depending on their function, need to satisfy one or more of the three following criteria:

a. **Structural adequacy:** The specimen can no longer carry its load (self-weight and superimposed loads). Examples are columns, beams, floors and walls.

b. **Integrity:** Cracks or openings develop that allow the passage of flames or hot gases.

c. **Insulation:** The unexposed face temperature rises by more than 140° C on average, or 180° C for a single point. This applies to fire separations and is required where the transmission of heat through the element may endanger occupants on the other side or cause fire to spread to other fire cells or adjacent buildings.

Systems that achieve a particular FRR can be used to satisfy the requirements for a lesser FRR.

Example:

Load-bearing (LB) **60 / 60 / 60**
Structural / Integrity / Insulation

Non-load-bearing (NLB) **- / 60 / 60**
– / Integrity / Insulation

USG Boral fire-rated plasterboard systems meet the requirements of the above clauses and definitions and have various systems for combinations as outlined in this manual. All USG Boral fire-rated plasterboard systems specified in this manual have been tested, or have opinions based on testing, as by independent accredited quality assurance organisations, including BRANZ and CSIRO. These organisations maintain strict quality control and continuous testing to ensure product consistency and reliability. System documentation, subject to commercial sensitivity, can be verified by requesting further information at 0800 USGBORAL (874-26725) or by email at info.nz@usgboral.com

GENERAL

CONDITIONS OF USE

USG Boral plasterboard systems are intended for normal conditions of dry internal use. All performance testing of USG Boral plasterboard systems has been carried out using dry ex-factory product. USG Boral plasterboard systems must not be exposed to water or installed in situations where extended exposure to humidity above 95% relative humidity can be expected. A suitable surface finish must be applied to USG Boral plasterboard in all areas where water or high humidity can be expected. Vinyl wallpaper and gloss and semi-gloss alkyd paints are suitable systems. A sealer coat must be rolled, not sprayed, prior to the top coats. Tiles may also be used – refer to the USG Boral BRANZ Appraised Wet Area Manual. Bathrooms, kitchens and laundries, for example, should have adequate ventilation or heating to avoid buildup of condensation.

Control joints should be provided to relieve stresses imposed by movement due to timber framing temperature or structural changes. Details of joint design should be obtained from the designer where control joints have been specified to be carried through USG Boral Fire-rated Plasterboard linings. The penetration of fire and sound control systems by unprotected services is detrimental to the plasterboard's performance and must be avoided.

All USG Boral Fire-rated Plasterboard must be mechanically fixed. Glue may not be substituted for mechanical fixing. Only screw lengths, spacings and type as defined by this manual can be used. Under no circumstances can alternative screws be used unless specified as an alternative in this manual or independently tested and verified for the relevant FRR.

Try to avoid penetrations at all costs. When penetrations are unavoidable, a baffle system, lined with the same FRR as the penetrated wall or ceiling, must be installed in the cavity. Refer to this manual for generic penetrations, or seek advice from a reputable company specialising in FRR penetration systems.

All outer layers of USG Boral Fire-rated Plasterboard systems must be stopped to a minimum level 3 stopping. Refer to the USG Boral Plasterboard Installation Manual general fixing requirements for stopping.

TABLE 1: **DO'S AND DON'TS**

Do fix sheets either horizontally or vertically	Don't combine horizontal and vertical orientation of sheets
Do ensure horizontal sheets have solid nogging behind joints for single-layer systems	Don't use plasterboard as back blocking behind horizontal joints
Do install back paper to stud, recessed joint facing out in multi-layer systems	
Do use a setting compound for taping joints	Don't use an airdry compound for taping except dedicated types
Do use paper tape for fire and bracing systems	Don't use fibreglass tape
Do use a 3-coat joint system	
Do ensure only mechanical fixings are used	Don't substitute adhesive for mechanical fixings
Do use the correct length, type & spacing of screws for steel or timber	Don't substitute recommended screw type or spacing with different ones
Do repair any surface damage as soon as practicable	Don't leave surface damage as it may compromise the fire-rating
Do avoid penetrations if possible	
Do seal any penetrations with a sealant equal to or greater than the FRR	Don't leave any penetration unsealed
Do use control joints at required spacings and fire rate for FRR	Don't exceed maximum distance between control joints
Do read this manual's Limitations of Use, Maintenance and correct FRR ratings for the appropriate usage	Don't assume the FRR
Do consult a fire or structural engineer, or Licensed Building Practitioner (LBP)	

STEEL FRAMED WALLS

USG Boral Fire-rated Plasterboard can be used for lining steel LB or NLB walls. (NOTE: Generally, steel stud walls are NLB).

Maximum spacing of studs is 600mm centres. Stud heights, Base Metal Thickness (BMT) and spacing will be governed by wind and seismic demand, and fire design serviceability criteria are determined by the framing supplier or fire engineer.

Some fire and acoustic systems use multiple sheets each side of the stud. Ensure the outer sheet is staggered 300mm centres minimum from the first sheet and that its edge is positioned over an adjacent stud. If a fire-rated sealant is used, ensure the sealant is of the same FRR as the specified system and that it has been independently tested and verified for the relevant FRR.

TIMBER-FRAMED WALLS

USG Boral Fire-rated Plasterboard systems can be used with timber-framed LB or NLB walls as defined by the NZBC and NZS 3604. Stud spacing and height should be as per NZS 3604 with a maximum of 600mm centres. Walls outside the scope of NZS 3604 require specific engineering design.

» GENERAL INFORMATION

All USG Boral fire-rated plasterboard sheet edges must be fixed over studs when placed vertically or have nogging behind sheet edges for horizontal fixing.

Certain types of USG Boral fire-rated plasterboard may be used as a bracing system (refer to the USG Boral Bracing Manual) but must have the screw lengths as defined in this manual for the equivalent FRR. If using more than two sheets against the same wall side, ensure that the first sheet that is placed against the timber stud is the bracing wall element. Ensure the outer wall sheet is staggered 300mm centres minimum from the first sheet and that its edge is positioned over an adjacent timber stud. If a fire-rated sealant is used, ensure that the sealant is of the same FRR as the specified system in use, and that it has been independently tested and verified for the relevant FRR.

FLOOR / CEILING SYSTEMS

GENERAL

When used in a floor/ceiling system, USG Boral Fire-rated Plasterboard systems must have a floor that is at least 20mm thick particle board or 17mm thick structural ply fixed to the floor joists, as per manufacturer's installation instructions.

When using a tongue and groove (T & G) system, ensure that all flooring boards have equalised to the interior environment before laying the flooring. Any gaps between boards must be solid filled, and flooring must be at least 18mm thick.

Insulation may be placed in between USG Boral Fire-rated Plasterboard and flooring. Ensure the insulation is a glass-fibre type or fire-retardant insulation (see manufacturer's specifications).

Try to avoid penetrations at all costs. When penetrations are unavoidable, including lights, a baffle system, lined with the same FRR as the penetrated ceiling, must be installed in the cavity. Refer to this manual for generic penetrations, or seek advice from a reputable company specialising in FRR penetration systems. For all lighting systems, LED lights that emit lower temperatures are recommended.

TIMBER JOISTS

USG Boral Fire-rated Plasterboard systems may be used in a floor/ceiling system as defined in NZS 3604 for floor loadings (2.0 kPa or 3.0 kPa). Consult NZS 3604 latest edition for floor joist spans lengths. Floor joists must be a minimum size of ex 190mm x 45mm and a maximum spacing of 600mm centres. Refer to this manual for recommended fixings and layer combinations.

COMPOSITE JOISTS / I BEAMS

USG Boral Fire-rated Plasterboard systems may be used with proprietary floor joist and ceiling systems. Refer to suppliers' technical information for design strength and serviceability details. Joists of this type must be manufactured using an A-Bond glue. Refer to this manual for recommended fixings and layer combinations.

STEEL JOISTS

USG Boral Fire-rated Plasterboard systems may be used with steel joists, flooring and ceiling systems. Steel floor joists shall be a minimum depth of 190mm C-section with 45mm flanges and a steel gauge of 1.6mm BMT minimum. Joist spacing is maximum 600mm centres. Refer to the National Association for Steel-framed Housing (NASH) for recommended fixings and layer combinations.

SUSPENDED CEILING GRID

USG Boral Fire-rated Plasterboard may be used with suspended ceiling grid **Rondo ScrewFix® Suspension system, Xpress® Drywall Grid Suspension system or Key-Lock® system**.

Alternative suspension systems with at least equivalent layout, material properties, strength and stiffness may be used.

Ensure that any type of suspended ceiling grid system complies with USG Boral Plasterboard weight distribution and thickness limitations.

Alternatively, **Rondo DONN Fire-rated Exposed Grid Suspension System** with **USG Boral Firecode™** ceiling tiles can provide floor/ceiling or roof/ceiling protection up to FRR 60 mins. Refer to the Rondo Fire-rated Exposed Grid Manual.

UNIVERSAL CEILING / ROOF CEILING SYSTEMS

USG Boral Fire-rated Plasterboard systems may be used as a universal ceiling system. By definition, a universal ceiling system is a ceiling without a floor above. A universal ceiling system typically consist of ceiling joists, rafters and the bottom cords of a truss roof. Universal ceiling systems can be either timber or steel, with or without battens, and may have a suspended clip system with timber or steel battens secured to the underside of the universal ceiling. The same criteria for fixings and installation apply to a floor/ceiling system.

Refer to this manual for recommended fixings and layer combinations.

BOUNDARY WALL

USG Boral Fire-rated Plasterboard systems may be used for fire-rated boundary walls. Boundary walls can be constructed with timber or steel studs and are defined as walls that are 1.0m or less from a delineated boundary. NZBC Clause C3.3 states that *"Buildings must be designed and constructed so that there is a low probability of fire spread to other property vertically or horizontally across a relevant boundary".*

Relevant NZBC Clauses:

- B1
- C3.4
- C3.6
- C3.7

Boundary walls require fire ratings on both sides of the wall (two-way system) and must stand so that they won't fall into a neighbouring property or across a boundary, and to ensure fire service personnel will not be endangered by the wall collapsing during the required FRR period.

The architect or designer must ensure that boundary walls have enough structural stability for the required FRR. Considering the provisions of NZBC Clause B1, guidance from a structural engineer may be required.

All timber framing on either a timber or concrete floor to the boundary wall should be built as per the latest edition of NZS 3604. A boundary wall exterior will require a FRR cladding. Limitations of this manual are to NZS 3604 and NASH – for taller buildings (greater than two storeys), a structural or fire engineer may need to evaluate the building. Refer to this manual for recommended fixings and layer combinations.

UNIVERSAL WALL

USG Boral Fire-rated Plasterboard systems may be used for a universal fire wall system. A universal fire wall is a one-way fire-rated system with any type of exterior cladding. Timber- or steel-framed walls must conform to NZS 3604 and NASH framing requirements.

Refer to this manual for exact fixings and layer combinations.

PROPERTY WALL

USG Boral Fire-rated Plasterboard systems may be used for a property wall. Property walls are defined as walls positioned further than 1.0m from a delineated boundary. The NZBC Clause C2 5.2 and Tables 5.2 and 5.3 stipulate distances from a delineated boundary and recommend the required fire protection as a percentage of exposed property wall that needs fire protection. FRR ratings are required for Structural Adequacy and Integrity. Insulation within the wall is not considered, as fire penetration will spread to the exterior walls through windows and unprotected walls.

MAINTENANCE

The long-term durability of any USG Boral Fire-rated Plasterboard system is conditional upon the systems being kept dry in service, and therefore compliant with the NZBC Clauses E2 External Moisture and E3 Internal Moisture.

This compliance ensures dry internal conditions and alleviates situations that may lead to timber movement, corrosion of metal components, moisture uptake by the gypsum core and fungal growth. USG Boral Fire-rated Plasterboard is a finishing material and during construction, it must be fully protected from direct sunlight, moisture and impact.

NZBC Clause C1 Outbreak of Fire provides for performance under C1.3.2, stating that a fixed appliance shall not raise the temperature of an element to a level that would adversely affect its physical properties. The maximum service temperature for USG Boral Plasterboard is 42°C. The paper face of the USG Boral Plasterboard shall be kept intact and care exercised during installation, prior to final surface finish, or wet stripping of wallpaper. Any surface damage to the paper face, cracks and nail / screw pops, or normal "wear and tear", should be made good as soon as practicable as the integrity of the board may be compromised. Cracks or nail / screw pops should be investigated and rectified to ensure they do not recur.

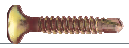
If cracks occur at junctions of bracing elements or at joints in fire or acoustic systems, they must be repaired immediately.

» GENERAL INFORMATION

FASTENERS

The following fasteners are suitable for fixing of plasterboard linings.

TABLE 2: **PLASTERBOARD SCREWS**[1]

SCREW TYPE		APPLICATION
S		Steel BMT* up to 0.75mm
W		Timber only
D		Steel BMT* 0.75–2.00mm
L		Gypsum board laminating

* BMT – Base Metal Thickness.

TABLE 3: **PLASTERBOARD TO PLASTERBOARD FASTENERS**

NUMBER OF LAYERS OF PLASTERBOARD x THICKNESS		TYPE L[10] SCREWS FOR FIXING PLASTERBOARD A TO B
PLASTERBOARD A	PLASTERBOARD B	
1 x 13mm	1 x 13mm	10-8 x 32mm
1 x 16mm	1 x 16mm	10-8 x 38mm
1 x 16mm	2 x 16mm	6-8 x 50mm

TABLE 4: **PLASTERBOARD TO FRAME FASTENERS**

PLASTERBOARD THICKNESS mm	TIMBER FRAME				STEEL FRAME
	USG BORAL SMOOTH SHANK GOLD PASSIVATED NAILS[9]	USG BORAL ANNULAR RING SHANK NAILS[9] AND UNI-NAILS[9]	GALVANISED NAILS[9] (2.8mm DIA UNO)	TYPE W SCREWS[2]	TYPE S[3] AND TYPE D[4] SCREWS
1 x 10	40 SOFTWOOD 30 HARDWOOD	30	40 SOFTWOOD 30 HARDWOOD	6-9 x 25W wall 6-9 x 32W ceiling	6-18 x 25[7] D, S
1 x 13	40 SOFTWOOD 30 HARDWOOD	30	40 SOFTWOOD 30 HARDWOOD	6-9 x 32W	6-18 x 25[7] D, S
1 x 16	50	-	50 SOFTWOOD 40 HARDWOOD	6-9 x 40W	6-18 x 30 D, S
1 x 25	-	-	-	-	6-18 x 40D, S
2 x 10	50	-	50	6-9 x 40W	6-18 x 30D, S
2 x 13	65	-	50	6-9 x 50W	6-18 x 40D, S
1 x 13 + 1 x 16	65	-	50	6-9 x 50W	6-18 x 40D, S
2 x 16	65	-	65	6-9 x 60W	6-18 x 45D, S
3 x 13	-	-	75 x 3.75	8-8 x 60W	7-16 x 50S
3 x 16	-	-	75 x 3.75	8-8 x 75W	8-15 x 60S

NOTES:

1. Screws must meet AS 3566 – *Corrosion Class 1.*
2. "W" = a needle point, bugle head type W gypsum screw for fixing to hardwood and softwood framing
3. "S" = a needle point, bugle head type S gypsum screw for fixing to steel gauges of up to 0.75mm BMT
4. "D" = a drill point, bugle head type D gypsum screw for fixing to steel gauges 0.80–2.00mm BMT
5. "L" = a needle point, bugle head type L gypsum screw for fixing plasterboard to plasterboard
6. Screw designation given as (minimum screw gauge) — (threads per inch +1) x (minimum screw length)
7. For ease of construction with framing steel gauges of less than 0.8mm BMT, use 30mm minimum screw length
8. Correct screw length is critical when fastening to resilient furring channel, to avoid acoustic bridging
9. Nail lengths are minimums – when longer nails are chosen, care should be taken to avoid nail bending in hardwoods or popping of plasterboard with unseasoned timber
10. For wall systems only. Tables to be read in conjunction with plasterboard installation details.

STEEL STUD WALLS

SYSTEMS + INNOVATIVE SYSTEMS SOLUTIONS

INTRODUCTION

DESCRIPTION

USG Boral steel stud wall systems consist of single or multiple layers of plasterboard, screw-fixed to one or both sides of light-gauge Rondo C-stud framing.

DESIGN OPTIONS

Steel stud wall systems outlined in this manual provide designers and builders with a wide range of options to suit project-specific requirements with regard to fire-rating, acoustic isolation, water resistance and impact resistance. A large number of hybrid systems have been included, providing cost-effective solutions when impact- and/or water- resistance requirements differ on each side of the wall.

Steel stud wall systems are available in fire-rated configurations up to FRR –/240/240 (180/180/180) and acoustic ratings up to STC = 75 (R_w=74).

The following types of steel stud wall systems are outlined in this manual:

- Single Stud
- Staggered Stud
- Twin Stud

MATERIALS

PLASTERBOARD LININGS

- 10mm / 13mm SHEETROCK® plasterboard
- 13mm / 16mm Firestop® plasterboard
- 10mm / 13mm / 16mm Multistop™ 4 plasterboard
- 25mm Shaftliner™ plasterboard
- 13mm / 16mm Fiberock® Aqua-Tough™

INSULATION

Glasswool

- 50mm, 75mm and 90mm glasswool insulation 11kg/m^3

Polyester

- 50mm, 75mm and 90mm polyester insulation 14kg/m^3 density

STEEL FRAMING

USG Boral steel stud wall systems utilise Rondo framing as outlined below.

Lipped C-studs

Lipped C-studs are available in a number of sizes and BMTs.

TABLE 5: **RONDO LIPPED C–STUDS**

STUD SIZE mm	BMT mm			
	0.50	0.55	0.75	1.15
51	●		●	
64	●		●	●
76		●	●	●
92		●	●	●
150			●	●

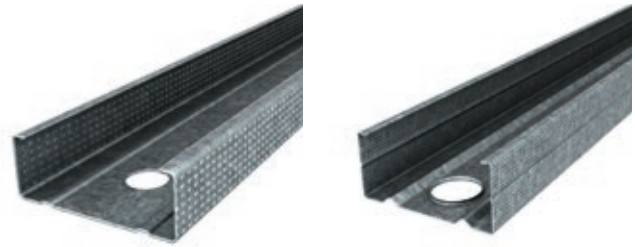


Figure 1: **Rondo Lipped C–studs**

» INTRODUCTION

Wall Tracks

Rondo Wall Tracks are available in the following sizes and BMTs.

TABLE 6: **RONDO WALL TRACKS**

STUD SIZE mm	BMT mm		
	0.50	0.70	1.15
51	●	●	
64	●	●	●
76	●	●	●
92	●	●	●

Figure 2: **Wall Track**

Deflection Head Tracks

Deflection head tracks are available in the following sizes and BMTs.

TABLE 7: **RONDO DEFLECTION HEAD TRACKS**

STUD SIZE mm	BMT mm			
	0.50	0.70	0.75	1.15
51		●		
64	●	●	●	●
76	●	●	●	●
92	●	●	●	●
150			●	●

Figure 3: **Deflection Head Tracks**

Screws

For screw types suitable for various lining configurations and steel stud BMTs, refer to General Information – Fasteners Tables 2-4.

DESIGN CONSIDERATIONS

MAXIMUM HEIGHTS

Wall heights for NLB walls must be within the maximum height limitations as set out in the maximum wall height tables for various systems – refer to Rondo New Zealand's technical manual.

NOTES FOR MAXIMUM HEIGHT TABLES

General

- Fire height limit (f) does not apply if fire resistant linings are used in non-fire rated walls. Refer to Rondo for maximum wall heights in such situations.
- Minimum yield stress of steel sections to be 270MPa.
- Deflection limit is height / 240 to a maximum of 30mm (for walls generally).
- Maximum slenderness ratio l/r = 300.
- Wall heights are for single piece Rondo lipped C–studs at maximum centres per Rondo Maximum Wall Height table.
- Wall heights are for NLB walls and account for the self-weight and lateral pressures stated.
- Shelf loading is not permitted for the maximum wall heights. Refer to Rondo for maximum heights with shelf loadings.
- Heights are for internal walls only. Refer to Rondo if walls are subject to external pressures.
- For fire service, 50Pa pressure is assumed. Where pressures are greater than 50Pa and fire loadings are likely to be combined with other loads, Rondo should be consulted.
- All plasterboard is to be manufactured by USG Boral.
- Walls are to be constructed to USG Boral standard C–Stud fire-rated or screw-fixed non-fire-rated wall details as appropriate, but with 300mm maximum screw centres.

» INTRODUCTION

INSTALLATION

USG Boral steel stud wall systems must be assembled strictly in accordance with the details and specifications outlined in this manual in order to achieve stated FRRs and acoustic ratings.

NOTE:

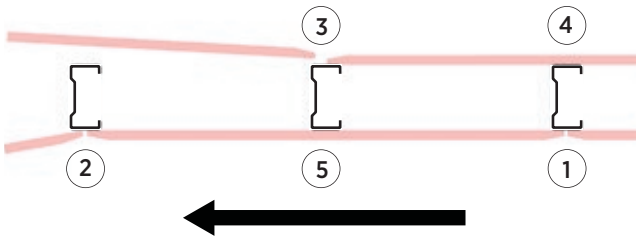
Where proprietary products have been tested in USG Boral systems by other manufacturers, reference should be made to the product manufacturer's specifications for details of tested designs and related Standards.

INSTALLATION AND FASTENING SEQUENCE

Unlike rigid timber framing, light-gauge steel studs are prone to flexing and twisting when driving fasteners to secure plasterboard sheets.

The first plasterboard sheet installed at a joint should be fixed to the open side of a stud flange. Additional sheets are then installed in the direction towards the closed side of the stud web.

When installing the first side, screw–fasten the plasterboard sheets to studs at the edges only, as illustrated in Figure 4 (positions 1 and 2). Then, on the second side, fasten the edge (position 3), followed by the intermediate studs (position 4). Return to the first side and fasten the sheets to the previously unattached studs (position 5).



CORRECT DIRECTION IN RELATION TO STUD

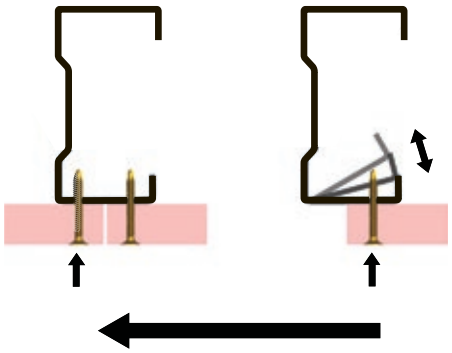
Figure 4: **Correct Fastening Sequence**

The correct direction of sheet installation is in the direction from the open side of the stud to the closed side of the stud web (see Figure 5). The first sheet installed at a joint is screwed to the flange at the open side of the stud. The flange will initially deflect and then straighten as the screw pulls tight. Ensure the stud is adequately supported to avoid twisting, and fully screw this sheet to the stud before continuing.

The next sheet can then be screwed to the flange at the closed side of the stud. The deflection on this part of the flange is very small and the previously installed sheet helps to keep the assembly rigid during the installation of the second sheet.

If fixed correctly, the result is a flat joint with no lipping. The correct installation sequence is illustrated in Figure 5 below.

Fix plasterboard sheets in the direction from the open side of the stud to the closed side of the stud.



CORRECT DIRECTION IN RELATION TO STUD

Figure 5: **Correct Fastening Sequence Detail**

LAYING OUT

- Accurately mark wall layouts.
- Always check individual measurements against overall site dimensions.
- Align the top and bottom tracks accurately according to the plan layout. Attach at ceiling and floor to structural elements.
- Use suitable fasteners for anchoring top and bottom tracks. Locate fasteners at 50mm from each end and spaced at maximum 600mm centres along each track.

FRAMING INSTALLATION

- For studs in fire-rated walls up to 3000mm high, cut studs a nominal 15mm short of the floor-to-ceiling height to allow a 15mm expansion gap at top.
- For studs in walls higher than 3000mm, allow a 5mm gap per 1000mm of height for expansion. Allowance should be made for possible deflection of floor/roof structure over walls.
- Studs may be boxed together to provide greater frame strength. Studs are usually boxed to frame door and other openings, and to support heavy fixtures on the partition.
- Studs in fire-rated partitions are not to be fastened to top tracks, except boxed studs at fire door openings, which should be pop-riveted to the tracks. When framing openings, secure both flanges of boxed studs to the tracks, using pop rivets (refer to the Junctions and Penetrations section, Figure 56, page 151).

» INTRODUCTION

- In addition to the noggings specified in the maximum heights notes, noggings are required as headers above doorways, for reinforcement behind fixture attachments, and where special circumstances require additional stiffening of the frame. Noggings are formed from lengths of steel track, approximately 100mm longer than the stud spacing. Cut the track flanges at approximately 45 degrees and bend the track ends at right angles to fit between the studs. Position and fasten with stud crimpers, or with pop rivets for fire door application.

PLASTERBOARD APPLICATION

- Plasterboard linings can be installed vertically or horizontally in fire-rated and non–fire-rated wall systems. Refer to Figures 6–13 for optional plasterboard configurations in steel stud wall systems.
- If no deflection requirement exists, cut plasterboard sheets to provide 10mm maximum gap at floor and ceiling (refer to the Junctions and Penetrations section for typical head and base details).
- Centre abutting vertical sheet edges on stud flanges. Refer to Table 8 below for minimum joint offsets.
- Fasten plasterboard sheets to steel framing with appropriate screws as outlined in the General Information section. Place screws 10–16mm from sheet ends and edges. Do not fasten plasterboard to top and bottom tracks in fire-rated systems. Sheets should be installed by advancing in the direction of the stud web (refer to Figures 4 and 5).
- Refer to Table 9 for maximum screw spacings.
- Refer to Figures 8 and 9 for screw layouts in multiple-layer fire-rated steel stud systems.

TABLE 8: **MINIMUM JOINT OFFSETS** (mm)

LINING LAYER	VERTICAL JOINTS	HORIZONTAL JOINTS
Inner/single layers on opposite sides or Adjacent layers on same side	One stud spacing (300 min)	300

TABLE 9: **MAXIMUM SCREW SPACING** (mm)

LINING LAYER	INTERMEDIATE STUDS	VERTICAL EDGES	INTERNAL/EXTERNAL CORNERS AND AROUND OPENINGS
Outer/single layer	300	200 (stagger screws in abutting sheets)	200
Inner layers	600	600	600

JOINTING AND FINISHING

- Finish all joints and internal and external corners in face layers with the appropriate USG Boral jointing system (refer to the USG Boral Plasterboard Installation Manual). Joints and junctions in inner layers of multiple layer systems do not need to be stopped.
- SHEETROCK® paper tape must be used in fire-rated, bracing and wet area systems.
- Stop exposed fasteners on face layers.

CAULKING

Caulk perimeter gaps and penetrations in fire-rated and acoustic walls with H.B. Fuller Firesound sealant (refer to the details in the Junctions and Penetrations section).

DECORATING

Apply paint or other decorative finishes as required. Refer to the USG Boral Plasterboard Installation Manual NZ for recommendations on decoration of plasterboard.

» INTRODUCTION

WALL CONSTRUCTION NOTES

- Steel stud wall systems are NLB unless noted otherwise.
- Wall systems should not be used where conditions of constant excessive moisture or humidity are prevalent: i.e., in excess of 90% relative humidity.
- Movement joints shall be put at building construction joint locations. Control joints shall be spaced at not more than 12m maximum centres.
- All approved fire-rated penetrations must be installed and caulked in accordance with the details provided in this manual. Components by others must be installed in accordance with the manufacturer's specifications and test reports.
- Fire-rated systems must be assembled strictly in accordance with relevant test reports, opinions, approved system details and specifications.
- Steel studs in fire-rated partitions are not to be fastened to top and bottom tracks except for boxed studs facing fire door openings, in which case the boxed studs are pop-riveted to the tracks.
- Steel wall framing must be constructed to specifications and spaced at 600mm centres maximum.
- Components must not be used if fractured or damaged.
- Butt joints must be backed by stud or nogging for fire-rated systems.
- Mid-span nogging is recommended for erection purposes for steel stud walls higher than 3600mm.

» INTRODUCTION

PLASTERBOARD INSTALLATION – FIRE-RATED WALLS

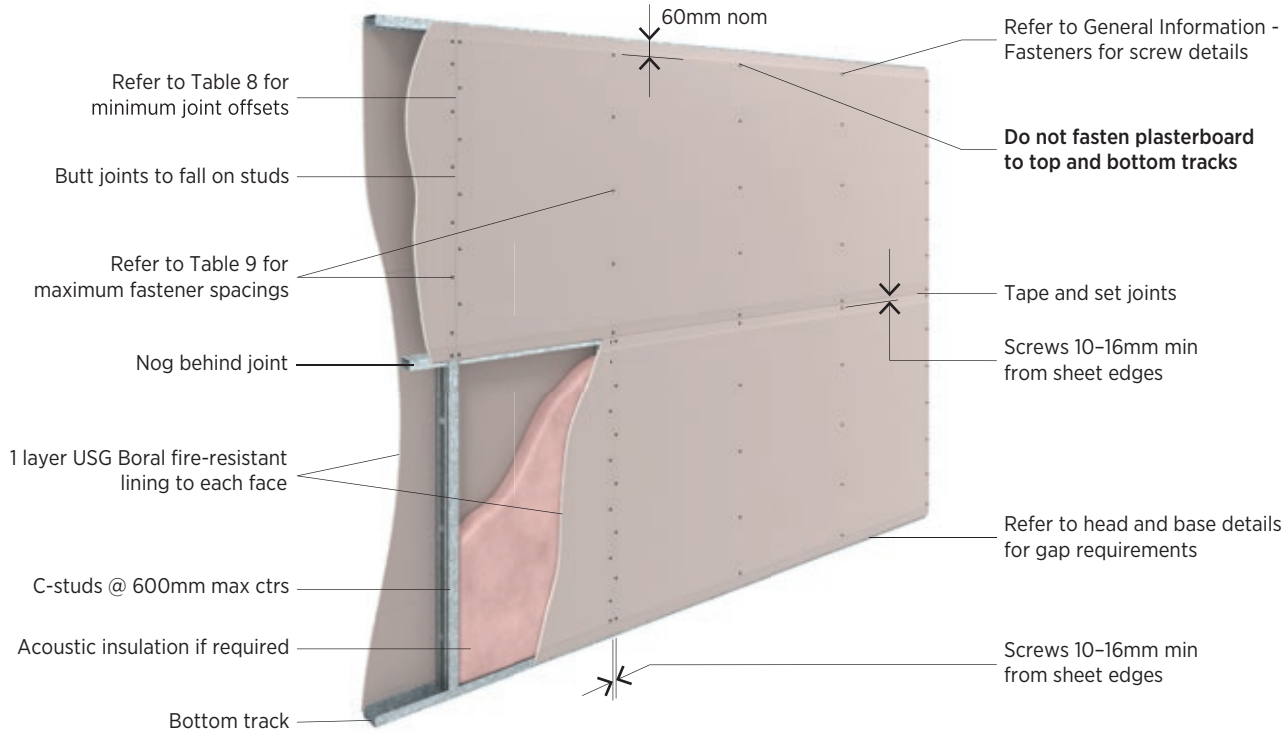


Figure 6: **Fire-rated Steel Stud – Horizontal Fixing – Single Layer**

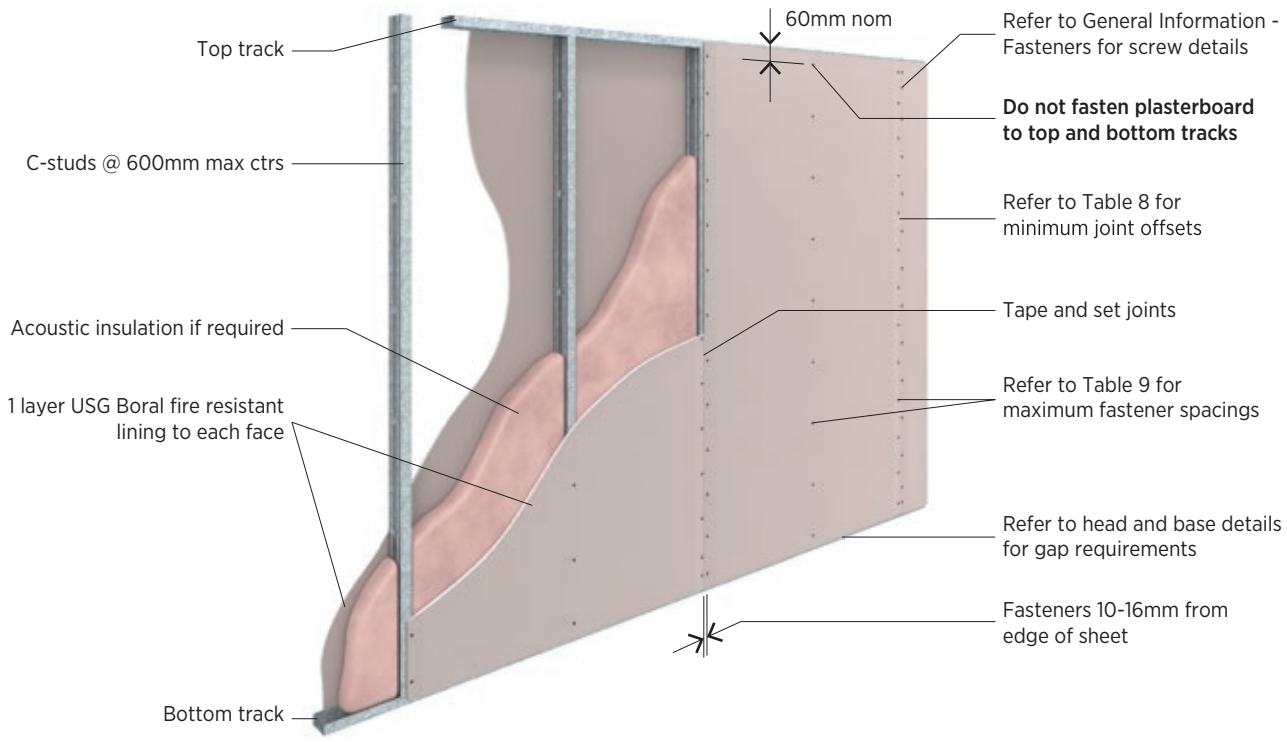


Figure 7: **Fire-rated Steel Stud – Vertical Fixing – Single Layer**

» INTRODUCTION

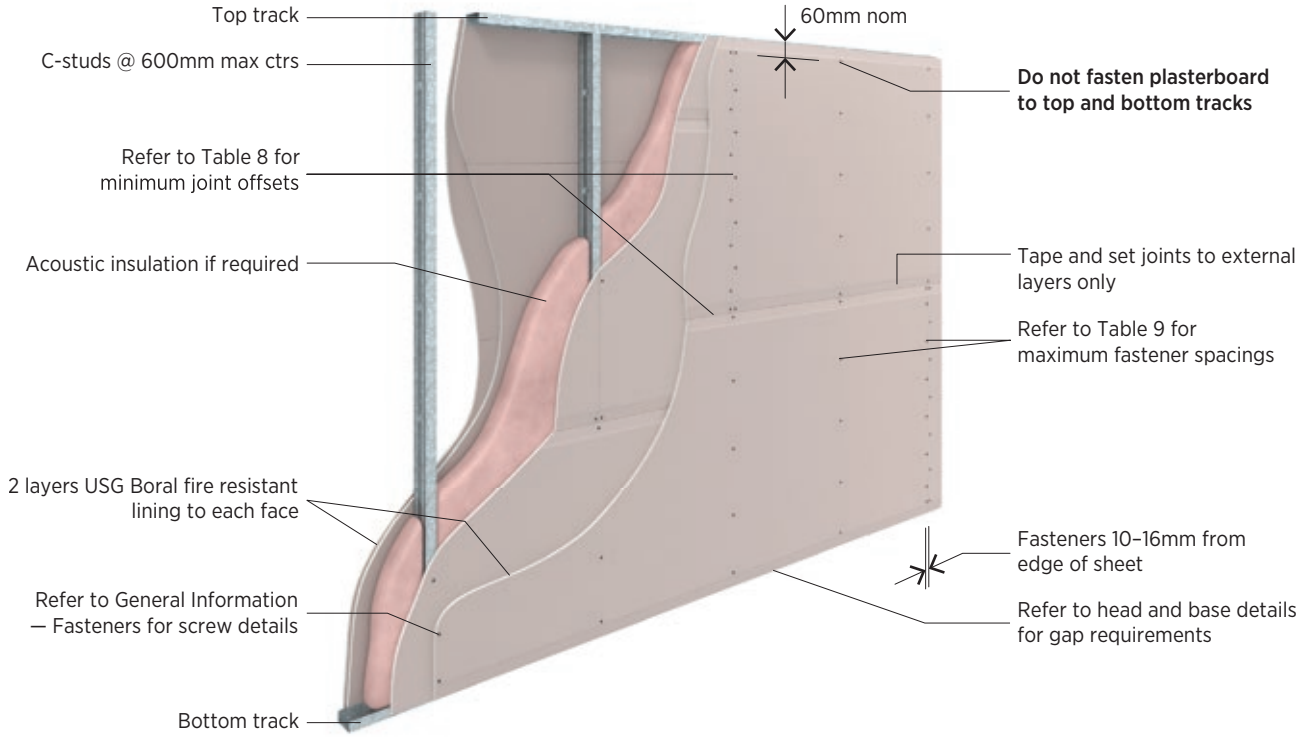


Figure 8: **Fire-rated Steel Stud – Horizontal Fixing – Multiple Layer**

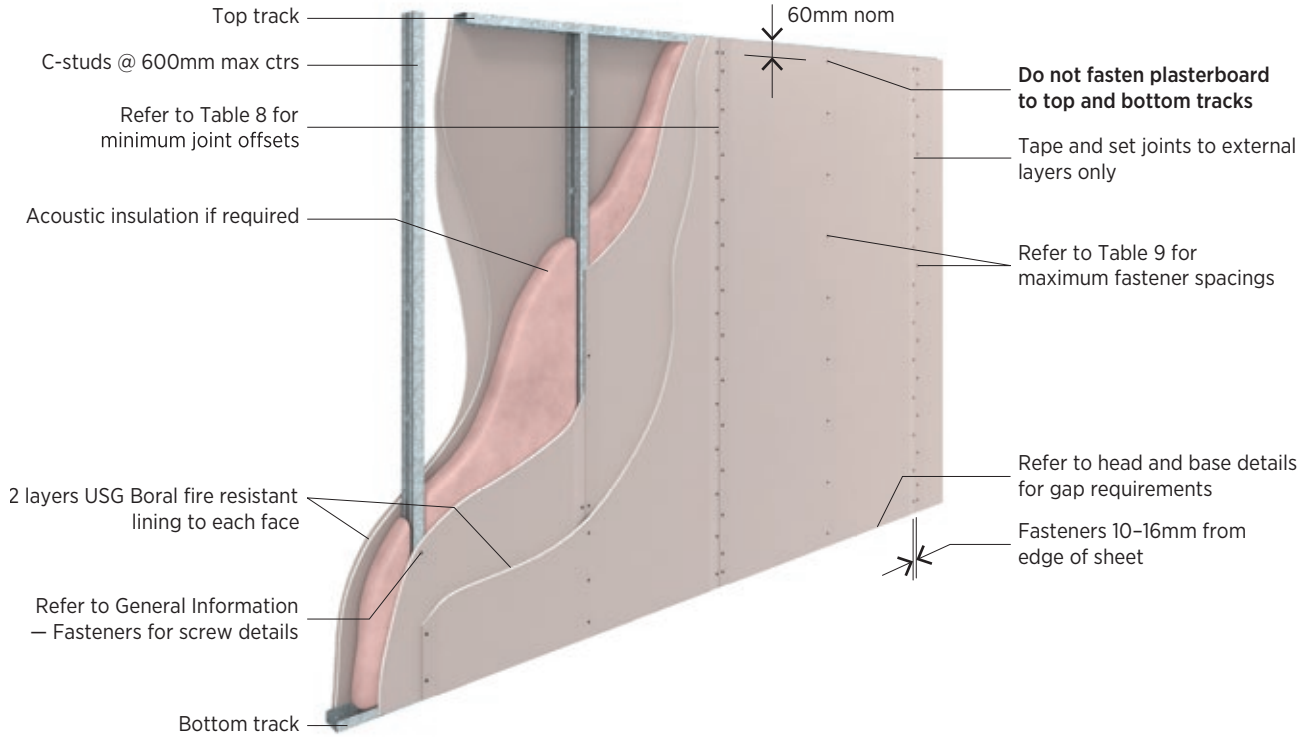


Figure 9: **Fire-rated Steel Stud – Vertical Fixing – Multiple Layer**

» INTRODUCTION

PLASTERBOARD INSTALLATION – NON–FIRE-RATED WALLS

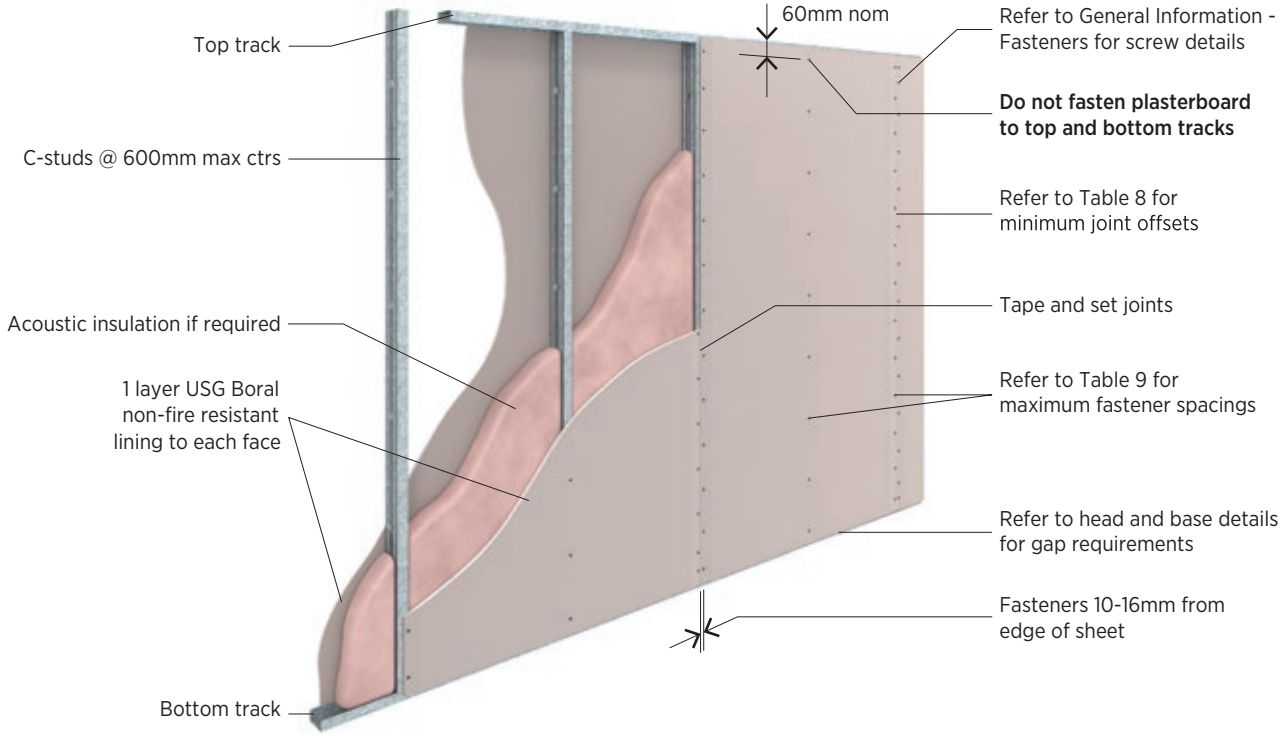


Figure 10: **Non–fire-rated Steel Stud – Vertical Fixing – Single Layer (fully screw-fixed)**

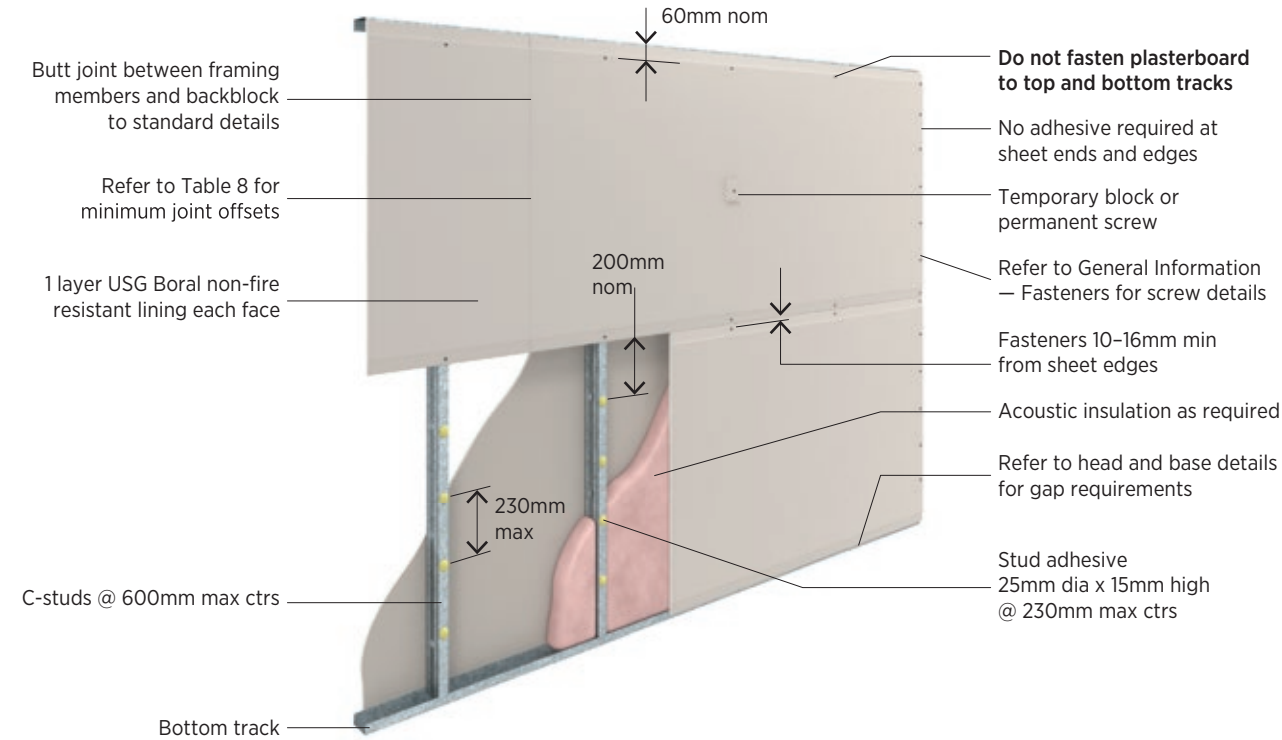


Figure 11: **Non–Fire-rated Steel Stud – Horizontal Fixing – Single Layer (combination adhesive and mechanical fixing option)**

NOTES:

- For a Level 5 finish, butt joints to fall between framing members, otherwise; butt joints may be fixed to studs.
- Combination adhesive and mechanical fixing method must not be used for Fiberock linings — only full screw fixing is allowed.

» INTRODUCTION

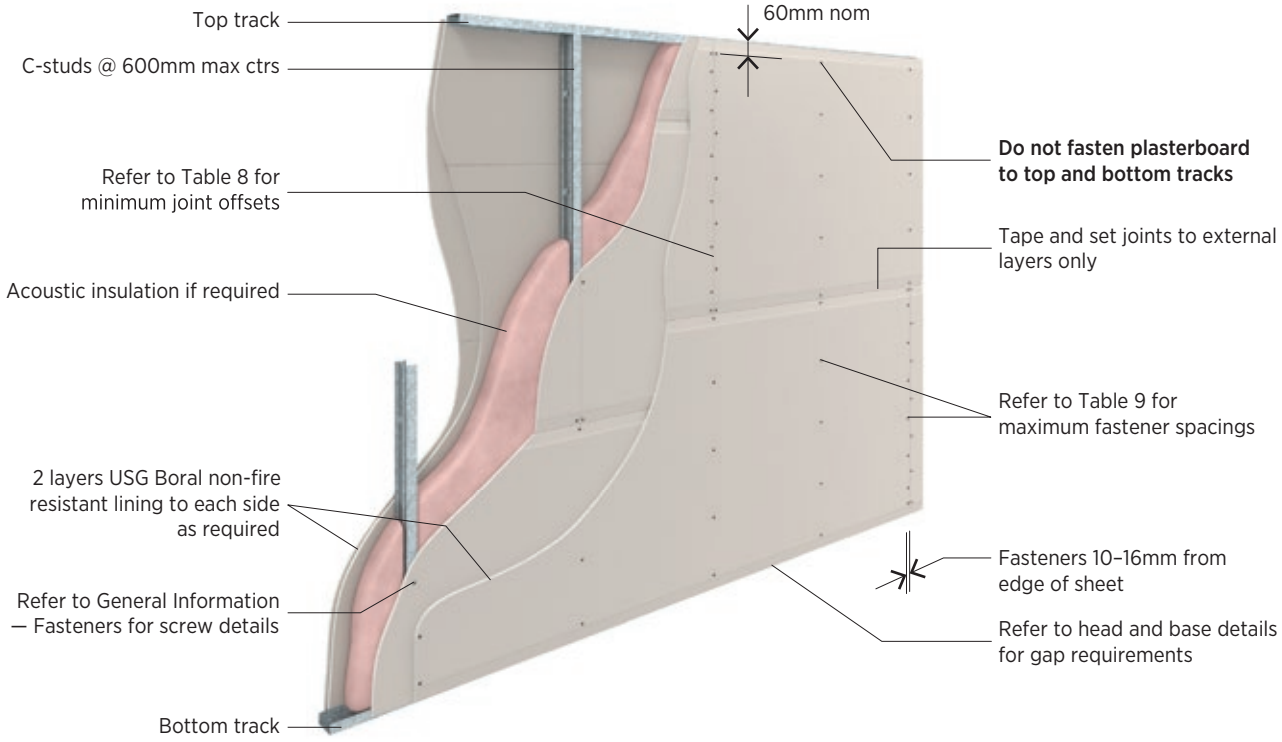


Figure 12: **Non–fire-rated Steel Stud – Horizontal Fixing – Double Layer**

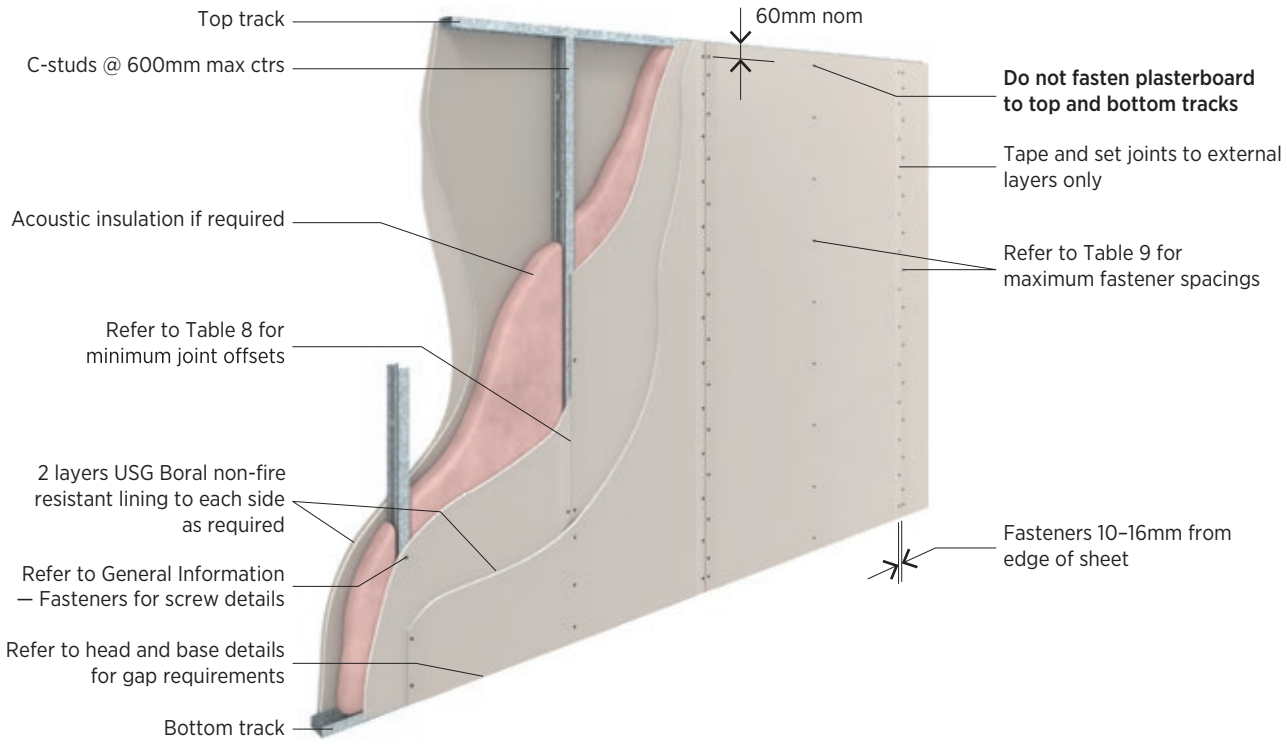


Figure 13: **Non–fire-rated Steel Stud – Vertical Fixing – Double Layer**

QUICK SELECTION TABLES

SINGLE STUD WALLS LINED BOTH SIDES

SYSTEM	PAGE NO	LINING SIDE 1	LINING SIDE 2	STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
				FRR	R_w					STC				
SB60.1	22	1x13mm fire resistant pbd*	1x13mm fire resistant pbd	–/60/60 30/30/30	34-42	35-43	36-45	37-46	36-44	35-43	36-44	37-46	38-47	37-45
SB90.1	22	1x13mm fire resistant pbd	2x13mm fire resistant pbd	–/90/90 30/30/30	40-47	41-47	42-49	42-51	41-49	41-48	42-48	43-50	43-52	42-50
SB90.2	23	1x16mm fire resistant pbd	1x16mm fire resistant pbd	–/90/90 60/60/60	38-45	39-46	40-48	41-48	40-46	39-46	40-47	41-49	42-49	41-47
SB120.1	23	2x13mm fire resistant pbd	2x13mm fire resistant pbd	–/120/120 90/90/90	44-50	45-51	46-52	47-54	46-51	45-51	46-52	47-53	48-55	47-52
SB180.1	24	2x16mm fire resistant pbd	2x16mm fire resistant pbd	–/180/180 120/120/120	45-51	46-52	47-53	47-54	47-52	46-52	47-53	48-54	48-55	48-53
SB180.2	24	1x25mm SHAFTLINER + 1x16mm fire resistant pbd	1x25mm SHAFTLINER + 1x16mm fire resistant pbd	–/180/180 120/120/120	48-56	49-56	50-56	50-56	50-53	48-56	49-56	50-56	50-56	50-53
SB240.1	25	2x25mm SHAFTLINER + 1x16mm fire resistant pbd	2x25mm SHAFTLINER + 1x16mm fire resistant pbd	–/240/240 180/180/180	54-60	55-60	56-60	57-60	56-57	55-61	56-61	57-61	58-61	57-58
SBF30.1	26	1x13mm FIBEROCK	1x13mm FIBEROCK	–/30/30 30/30/30	38-41	39-42	40-46	41-48	41-48	37-40	39-42	40-45	41-47	40-47
SBF30.2	26	1x13mm FIBEROCK	2x13mm FIBEROCK	–/30/30 30/30/30	41-46	43-46	44-50	45-52	46-56	41-45	43-46	44-50	45-51	45-51
SBF60.1	26	1x16mm FIBEROCK	1x16mm FIBEROCK	–/60/60 60/60/60	40-45	41-45	42-48	43-49	42-49	40-44	41-44	42-47	42-48	42-47
SBF90.1	27	2x13mm FIBEROCK	2x13mm FIBEROCK	–/90/90	–	48-51	49-53	–	–	–	49-52	49-54	–	–
SBF120.1	27	2x13mm FIBEROCK	2x13mm FIBEROCK	–/120/120	–	–	–	50-55	50-55	–	–	–	50-55	49-54
SBF120.2	27	2x16mm FIBEROCK	2x16mm FIBEROCK	–/120/120	49-51	50-52	51-54	51-55	50-54	50-53	50-52	50-53	50-54	49-53

* pbd = plasterboard

QUICK SELECTION TABLES

STAGGERED STUD WALLS								
SYSTEM	PAGE NO	LINING SIDE 1	LINING SIDE 2	TRACK SIZE mm	92	150	92	150
				FRR	R_w		STC	
SS60.1	28	1x13mm fire resistant pbd	1x13mm fire resistant pbd	–/60/60	40-51	42-53	40-51	42-53
SS90.1	28	1x13mm fire resistant pbd	2x13mm fire resistant pbd	–/90/90	43-56	46-58	43-56	46-58
SS90.3	29	1x16mm fire resistant pbd	1x16mm fire resistant pbd	–/90/90	43-54	46-56	43-54	46-56
SS120.1	29	2x13mm fire resistant pbd	2x13mm fire resistant pbd	–/120/120	47-60	50-61	47-60	50-61
SS180.1	30	2x16mm fire resistant pbd	2x16mm fire resistant pbd	–/180/180	48-60	51-61	48-60	51-61
SSF30.1	31	1x13mm FIBEROCK	1x13mm FIBEROCK	–/30/30	41-54	44-55	40-53	43-56
SSF30.2	31	1x13mm FIBEROCK	2x13mm FIBEROCK	–/30/30	46-58	49-59	46-57	49-58
SSF60.1	31	1x16mm FIBEROCK	1x16mm FIBEROCK	–/60/60	45-58	48-59	42-59	44-60
SSF90.1	32	2x13mm FIBEROCK	2x13mm FIBEROCK	–/90/90	52-63	55-65	51-63	54-64
SSF120.1	32	2x13mm FIBEROCK	2x13mm FIBEROCK	–/120/120	–	55-65	–	54-64
SSF120.2	32	2x16mm FIBEROCK	2x16mm FIBEROCK	–/120/120	54-65	58-65	52-65	56-65

QUICK SELECTION TABLES

TWIN STUD WALLS

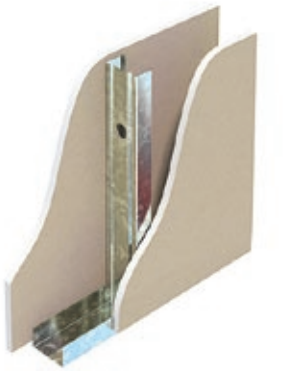
SYSTEM	PAGE NO	LINING SIDE 1	LINING SIDE 2	STUD SIZE mm	64	75	92	150	64	76	92	150
				FRR	R_w				STC			
ST60.1	33	1x13mm fire resistant pbd	1x13mm fire resistant pbd	–/60/60 30/30/30	43-58	44-59	46-59	47-59	44-59	45-60	47-60	48-60
ST90.1	33	1x13mm fire resistant pbd	2x13mm fire resistant pbd	–/90/90 30/30/30	48-64	49-64	50-66	52-66	49-65	50-65	51-67	53-67
ST90.2	34	1x16mm fire resistant pbd	1x16mm fire resistant pbd	–/90/90 60/60/60	46-61	47-62	48-63	51-64	47-62	48-63	49-64	52-65
ST120.1	34	2x13mm fire resistant pbd	2x13mm fire resistant pbd	–/120/120 90/90/90	53-64	54-66	55-67	58-68	54-65	55-67	56-68	59-69
ST180.1	35	2x16mm fire resistant pbd	2x16mm fire resistant pbd	–/180/180 120/120/120	52-64	53-66	54-67	58-68	53-65	54-67	55-68	59-69
STF30.1	36	1x13mm FIBEROCK	2x13mm FIBEROCK	–/30/30	49-61	50-62	51-64	52-65	49-62	50-63	51-65	52-66
STF60.1	36	1x16mm FIBEROCK	1x16mm FIBEROCK	–/60/60	48-60	48-61	49-63	50-64	44-61	44-62	45-64	48-65
STF90.1	37	2x13mm FIBEROCK	2x13mm FIBEROCK	–/90/90	56-67	57-69	–	–	55-68	55-70	–	–
STF120.1	37	2x13mm FIBEROCK	2x13mm FIBEROCK	–/120/120	–	–	57-71	58-72	–	–	55-72	55-73
STF120.2	38	2x16mm FIBEROCK	2x16mm FIBEROCK	–/120/120	58-69	59-71	60-73	61-74	57-70	57-72	57-74	57-75

SINGLE STUD

SB60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FCO–1045, FCO–1360, EWFA 27211–00



Side 1: 1x13mm fire resistant pbd
Framing: Steel studs
Insulation: Refer to table
Side 2: 1x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

Based on studs @ 600mm ctrs and thinnest available stud gauge

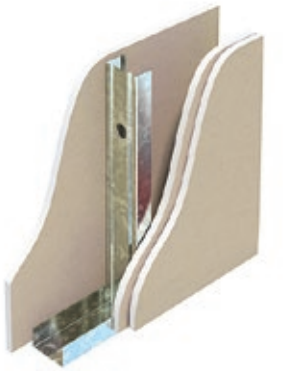
SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	77	90	101	118	176	77	90	101	118	176
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_W					STC				
SB60.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	Nil	34	35	36	37	36	35	36	37	38	37
			50G11, 50P14	40	42	43	43	42	41	43	44	44	43
			75G11, 75P14	–	–	45	45	44	–	–	46	46	45
			90G11, 90P14	–	–	–	45	44	–	–	–	46	45
SB60.1B	1x13mm MULTISTOP	1x13mm MULTISTOP	Nil	36	37	38	39	37	37	38	39	40	38
			50G11, 50P14	42	43	44	45	43	43	44	45	46	44
			75G11, 75P14	–	–	45	46	44	–	–	46	47	45
			90G11, 90P14	–	–	–	46	44	–	–	–	47	45
SB60.1C	1x13mm FIRESTOP	1x13mm MULTISTOP	Nil	35	36	37	38	36	36	37	38	39	37
			50G11, 50P14	41	43	43	45	43	42	44	44	46	44
			75G11, 75P14	–	–	45	46	44	–	–	46	47	45
			90G11, 90P14	–	–	–	46	44	–	–	–	47	45

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

SB90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: SI 515, FCO–1360, FCO–1045, EWFA 27211–00



Side 1: 1x13mm fire resistant pbd
Framing: Steel studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	90	103	116	131	189	90	103	114	131	189
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_W					STC				
SB90.1A	1x13mm FIRESTOP	2x13mm FIRESTOP	Nil	40	41	42	42	41	41	42	43	43	42
			50G11, 50P14	45	46	47	48	47	46	47	48	49	48
			75G11, 75P14	–	–	48	49	48	–	–	49	50	49
			90G11, 90P14	–	–	–	50	49	–	–	–	51	50
SB90.1B	1x13mm MULTISTOP	2x13mm MULTISTOP	Nil	40	42	42	43	42	41	43	43	44	43
			50G11, 50P14	47	47	48	49	47	48	48	49	50	48
			75G11, 75P14	–	–	49	50	48	–	–	50	51	49
			90G11, 90P14	–	–	–	51	49	–	–	–	52	50
SB90.1C	1x13mm FIRESTOP	2x13mm MULTISTOP	Nil	40	41	42	43	42	41	42	43	44	43
			50G11, 50P14	46	47	48	49	47	47	48	49	50	48
			75G11, 75P14	–	–	49	50	48	–	–	50	51	49
			90G11, 90P14	–	–	–	51	49	–	–	–	52	50

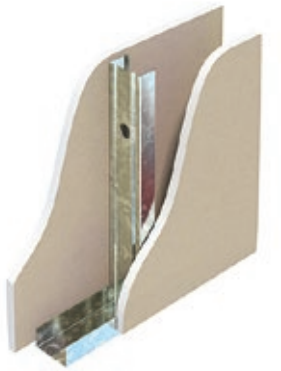
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

SINGLE STUD

SB90.2

FIRE RESISTANCE RATING
NLB **–/90/90**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FCO–1360, FCO–1045, EWFA 27211–00



Side 1: 1x16mm fire resistant pbd
Framing: Steel studs
Insulation: Refer to table
Side 2: 1x16mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

Based on studs @ 600mm ctrs and thinnest available stud gauge

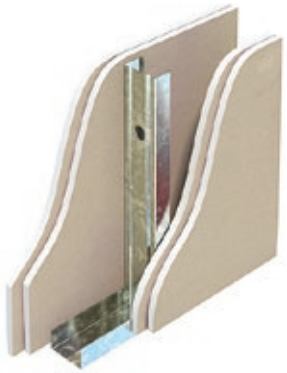
SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	83	96	107	124	182	83	96	107	124	182
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_w					STC				
SB90.2A	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil	38	39	40	41	40	39	40	41	42	41
			50G11, 50P14	44	45	46	47	45	45	46	47	48	46
			75G11, 75P14	–	–	48	48	46	–	–	49	49	47
			90G11, 90P14	–	–	–	48	46	–	–	–	49	47
SB90.2B	1x16mm MULTISTOP	1x16mm MULTISTOP	Nil	38	39	40	41	40	39	40	41	42	41
			50G11, 50P14	45	46	47	47	45	46	47	48	48	46
			75G11, 75P14	–	–	48	48	46	–	–	49	49	47
			90G11, 90P14	–	–	–	48	46	–	–	–	49	47
SB90.2C	1x16mm FIRESTOP	1x16mm MULTISTOP	Nil	38	39	40	41	40	39	40	41	42	41
			50G11, 50P14	45	45	46	47	45	46	46	47	48	46
			75G11, 75P14	–	–	47	48	46	–	–	48	49	47
			90G11, 90P14	–	–	–	48	46	–	–	–	49	47

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

SB120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
LB **90/90/90**
FROM BOTH SIDES

FRR Basis: SI 720, SI 474, FCO–1360, FCO–1045, WFRA C91228, EWFA 27211–00



Side 1: 2x13mm fire resistant pbd
Framing: Steel studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	103	116	127	144	202	103	116	127	144	202
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_w					STC				
SB120.1A	2x13mm FIRESTOP	2x13mm FIRESTOP	Nil	44	45	46	47	46	45	46	47	48	47
			50G11, 50P14	49	50	50	51	49	50	51	51	52	50
			75G11, 75P14	–	–	51	52	50	–	–	52	53	51
			90G11, 90P14	–	–	–	53	51	–	–	–	54	52
SB120.1B	2x13mm MULTISTOP	2x13mm MULTISTOP	Nil	46	47	47	48	47	47	48	48	49	48
			50G11, 50P14	50	51	51	52	49	51	52	52	53	50
			75G11, 75P14	–	–	52	53	50	–	–	53	54	51
			90G11, 90P14	–	–	–	54	51	–	–	–	55	52
SB120.1C	2x13mm FIRESTOP	2x13mm MULTISTOP	Nil	45	46	47	47	47	46	47	48	48	48
			50G11, 50P14	49	50	51	51	49	50	51	52	52	50
			75G11, 75P14	–	–	52	52	50	–	–	53	53	51
			90G11, 90P14	–	–	–	53	51	–	–	–	54	52

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

SINGLE STUD

SB180.1

FIRE RESISTANCE RATING
NLB **–/180/180**
LB **120/120/120**
FROM BOTH SIDES

FRR Basis: SI 1453, FCO–1360, FCO–1045, WFRA C91228, EWFA 27211–00

Side 1: 2x16mm fire resistant pbd
Framing: Steel studs
Insulation: Refer to table
Side 2: 2x16mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	115	128	139	156	214	115	128	139	156	214
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_W					STC				
SB180.1A	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil	45	46	47	47	47	46	47	48	48	48
			50G11, 50P14	50	51	51	52	50	51	52	52	53	51
			75G11, 75P14	–	–	53	53	51	–	–	54	54	52
			90G11, 90P14	–	–	–	54	52	–	–	–	55	53
SB180.1B	2x16mm MULTISTOP	2x16mm MULTISTOP	Nil	46	47	47	48	47	47	48	48	49	48
			50G11, 50P14	51	52	52	52	50	52	53	53	53	51
			75G11, 75P14	–	–	53	53	51	–	–	54	54	52
			90G11, 90P14	–	–	–	54	52	–	–	–	55	53
SB180.1C	2x16mm FIRESTOP	2x16mm MULTISTOP	Nil	45	46	47	48	47	46	47	48	49	48
			50G11, 50P14	51	51	52	52	50	52	52	53	53	51
			75G11, 75P14	–	–	53	53	51	–	–	54	54	52
			90G11, 90P14	–	–	–	54	52	–	–	–	55	53

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm olyester insulation 14kg/m³

SB180.2

FIRE RESISTANCE RATING
NLB **–/180/180**
LB **120/120/120**
FROM BOTH SIDES

FRR Basis: FCO–2440

Side 1: 1x25 Shaftliner pbd + 1x16mm Firestop pbd
Framing: Steel studs + Linerstrips
Insulation: Refer to table
Side 2: 1x25 Shaftliner pbd + 1x16mm Firestop pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	133	146	157	174	232	133	146	157	174	232
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_W					STC				
SB180.2A	1x25mm SHAFTLINER + 1x16mm FIRESTOP	1x25mm SHAFTLINER + 1x16mm FIRESTOP	Nil	48	49	50	50	50	49	50	51	51	51
			50G11, 50P14	56	56	56	56	53	57	57	57	57	54
			75G11, 75P14	–	–	56	56	53	–	–	57	57	54
			90G11, 90P14	–	–	–	56	53	–	–	–	57	54

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm olyester insulation 14kg/m³

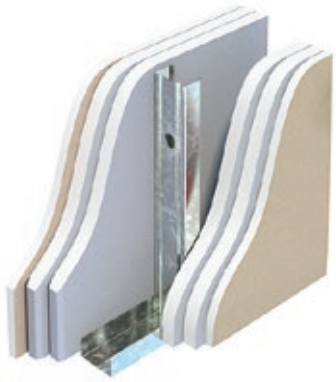
For maximum wall heights contact USG Boral

SINGLE STUD

SB240.1

FIRE RESISTANCE RATING
NLB **–/240/240**
LB **180/180/180**
FROM BOTH SIDES

FRR Basis: FCO–2440



Side 1: 2x25mm Shaftliner pbd + 1x16mm Firestop pbd
Framing: Steel studs + Linerstrips
Insulation: Refer to table
Side 2: 2x25mm Shaftliner pbd + 1x16mm Firestop pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	183	196	207	224	282	183	196	207	224	282
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_w					STC				
SB240.1A	2x25mm SHAFTLINER + 1x16mm FIRESTOP	2x25mm SHAFTLINER + 1x16mm FIRESTOP	Nil	54	55	56	57	56	55	56	57	58	57
			50G11, 50P14	60	60	60	60	57	61	61	61	61	58
			75G11, 75P14	–	–	60	60	57	–	–	61	61	58
			90G11, 90P14	–	–	–	60	57	–	–	–	61	58

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

For maximum wall heights contact USG Boral

FIBEROCK – SINGLE STUD

SBF30.1

FIRE RESISTANCE RATING
NLB **–/30/30**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396, FAR3242

ACOUSTIC RATINGS BASIS: SLR-FB-S-S-01 — Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	77	90	101	118	176	77	90	101	118	176
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_W					STC				
SBF30.1A	1x13mm FIBEROCK	1x13mm FIBEROCK	Nil	38	39	40	41	41	37	39	40	41	40
			50G11, 50P14	41	42	43	46	46	40	41	43	45	45
			75G11, 75P14	–	–	46	47	47	–	–	45	46	46
			90G11, 90P14	–	–	–	48	48	–	–	–	47	47

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

Side 1: 1x13mm Fiberock
Framing: Steel studs
Insulation: Refer to table
Side 2: 1x13mm Fiberock

SBF30.2

FIRE RESISTANCE RATING
NLB **–/30/30**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396, FAR3242

ACOUSTIC RATINGS BASIS: SLR-FB-S-S-01 — Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	90	103	114	131	189	90	103	114	131	189
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_W					STC				
SBF30.2A	1x13mm FIBEROCK	2x13mm FIBEROCK	Nil	41	43	44	45	46	41	43	44	45	45
			50G11, 50P14	46	46	47	49	49	45	46	47	49	49
			75G11, 75P14	–	–	50	50	50	–	–	50	50	49
			90G11, 90P14	–	–	–	52	52	–	–	–	51	51

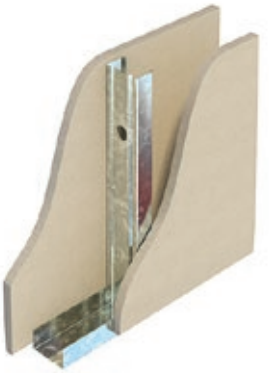
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

Side 1: 1x13mm Fiberock
Framing: Steel studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

SBF60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FSV1427a, FAR2311



ACOUSTIC RATINGS BASIS: SLR-FB-S-S-01 — Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	83	96	107	124	182	83	96	107	124	182
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_W					STC				
SBF60.1A	1x16mm FIBEROCK	1x16mm FIBEROCK	Nil	40	41	42	43	42	40	41	42	42	42
			50G11, 50P14	45	45	46	47	47	44	44	45	46	45
			75G11, 75P14	–	–	48	48	48	–	–	47	47	46
			90G11, 90P14	–	–	–	49	49	–	–	–	48	47

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

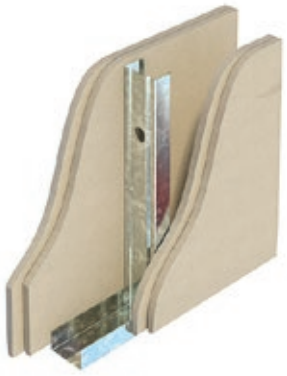
Side 1: 1x16mm Fiberock
Framing: Steel studs
Insulation: Refer to table
Side 2: 1x16mm Fiberock

FIBEROCK – SINGLE STUD

SBF90.1^

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FAR4405



ACOUSTIC RATINGS BASIS: SLR-FB-S-S-01

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	103	116	127	144	202	103	116	127	144	202
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_w					STC				
SBF90.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil	–	48	49	–	–	–	49	49	–	–
			50G11, 50P14	–	51	51	–	–	–	52	52	–	–
			75G11, 75P14	–	–	53	–	–	–	–	54	–	–
			90G11, 90P14	–	–	–	–	–	–	–	–	–	–

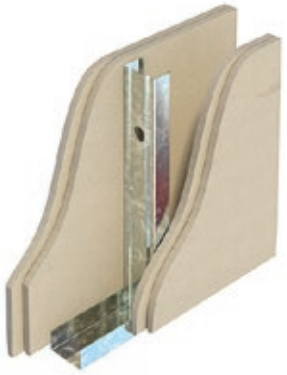
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³
^ System SBF90.1 must utilise 64mm or 75mm studs only

Side 1: 2x13mm Fiberock
Framing: Steel studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

SBF120.1^

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR4405



ACOUSTIC RATINGS BASIS: SLR-FB-S-S-01

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	103	116	127	144	202	103	116	127	144	202
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_w					STC				
SBF120.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil	–	–	–	50	50	–	–	–	50	49
			50G11, 50P14	–	–	–	52	52	–	–	–	53	52
			75G11, 75P14	–	–	–	54	53	–	–	–	55	53
			90G11, 90P14	–	–	–	55	55	–	–	–	55	54

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³
^ System SBF120.1 must utilise 92mm or 150mm studs only

Side 1: 2x13mm Fiberock
Framing: Steel studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

SBF120.2

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FSV1401a

ACOUSTIC RATINGS BASIS: SLR-FB-S-S-01

Based on studs @ 600mm ctrs and thinnest available stud gauge

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	115	128	139	156	214	115	28	139	156	214
			STUD SIZE mm	51	64	75	92	150	51	64	75	92	150
			INSULATION*	R_w					STC				
SBF120.2A	2x16mm FIBEROCK	2x16mm FIBEROCK	Nil	49	50	51	51	50	50	50	50	50	49
			50G11, 50P14	51	52	53	53	52	53	52	52	52	51
			75G11, 75P14	–	–	54	54	53	–	–	53	53	52
			90G11, 90P14	–	–	–	55	54	–	–	–	54	53

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

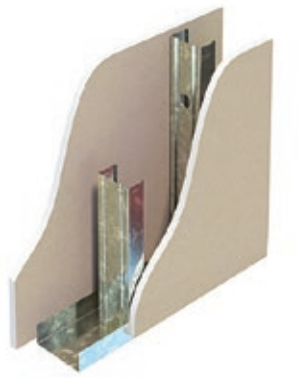
Side 1: 2x16mm Fiberock
Framing: Steel studs
Insulation: Refer to table
Side 2: 2x16mm Fiberock

STAGGERED STUD

SS60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
FROM BOTH SIDES

FRR Basis: FR2539, FCO–0512, 99/1370, EWFA 27211–00



Side 1: 1x13mm fire resistant pbd
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 1x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03 — Based on studs @ 600mm ctrs

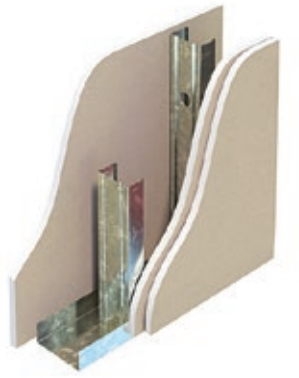
SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	118	176	118	176
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_w		STC	
SS60.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	Nil	40	42	40	42
			50G11, 50P14	48	50	48	50
			75G11, 75P14	49	51	49	51
			90G11, 90P14	49	52	49	52
SS60.1B	1x13mm MULTISTOP	1x13mm MULTISTOP	Nil	42	44	42	44
			50G11, 50P14	49	52	49	52
			75G11, 75P14	50	53	50	53
			90G11, 90P14	51	53	51	53
SS60.1C	1x13mm FIRESTOP	1x13mm MULTISTOP	Nil	41	43	41	43
			50G11, 50P14	49	51	49	51
			75G11, 75P14	50	52	50	52
			90G11, 90P14	50	52	50	52

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

SS90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FR2539, FCO–0512, 99/1370, EWFA 27211–00



Side 1: 1x13mm fire resistant pbd
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	131	189	131	189
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_w		STC	
SS90.1A	1x13mm FIRESTOP	2x13mm FIRESTOP	Nil	43	46	43	46
			50G11, 50P14	53	55	53	55
			75G11, 75P14	54	56	54	56
			90G11, 90P14	55	57	55	57
SS90.1B	1x13mm MULTISTOP	2x13mm MULTISTOP	Nil	45	48	45	48
			50G11, 50P14	54	56	54	56
			75G11, 75P14	55	57	55	57
			90G11, 90P14	56	58	56	58
SS90.1C	1x13mm FIRESTOP	2x13mm MULTISTOP	Nil	44	47	44	47
			50G11, 50P14	53	55	53	55
			75G11, 75P14	54	56	54	56
			90G11, 90P14	55	58	55	58

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

STAGGERED STUD

SS90.3

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FR2539, FCO–0512, 99/1370, EWFA 27211–00

Side 1: 1x16mm fire resistant pbd
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 1x16mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03 — Based on studs @ 600mm ctrs

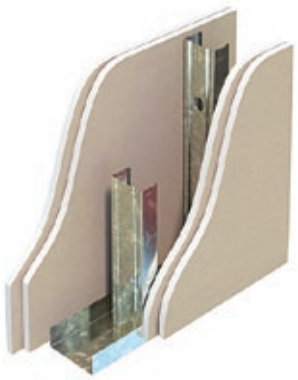
SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	124	182	124	182
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_w		STC	
SS90.3A	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil	43	46	43	46
			50G11, 50P14	51	53	51	53
			75G11, 75P14	52	55	52	55
			90G11, 90P14	53	55	53	55
SS90.3B	1x16mm MULTISTOP	1x16mm MULTISTOP	Nil	44	46	44	46
			50G11, 50P14	52	54	52	54
			75G11, 75P14	53	55	53	55
			90G11, 90P14	54	56	54	56
SS90.3C	1x16mm FIRESTOP	1x16mm MULTISTOP	Nil	44	47	44	47
			50G11, 50P14	52	54	52	54
			75G11, 75P14	53	55	53	55
			90G11, 90P14	53	55	53	55

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

SS120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FR2539, FCO–0512, 99/1370, EWFA 27211–00



Side 1: 2x13mm fire resistant pbd
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	144	202	144	202
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_w		STC	
SS120.1A	2x13mm FIRESTOP	2x13mm FIRESTOP	Nil	47	50	47	50
			50G11, 50P14	56	58	56	58
			75G11, 75P14	57	59	57	59
			90G11, 90P14	58	60	58	60
SS120.1B	2x13mm MULTISTOP	2x13mm MULTISTOP	Nil	49	51	49	51
			50G11, 50P14	58	59	58	59
			75G11, 75P14	59	60	59	60
			90G11, 90P14	60	61	60	61
SS120.1C	2x13mm FIRESTOP	2x13mm MULTISTOP	Nil	48	51	48	51
			50G11, 50P14	57	58	57	58
			75G11, 75P14	58	60	58	60
			90G11, 90P14	59	61	59	61

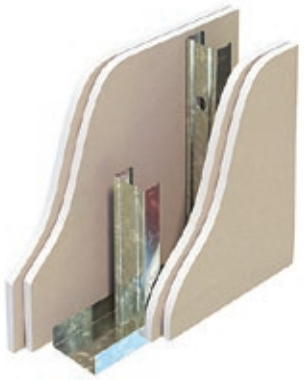
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

STAGGERED STUD

SS180.1

FIRE RESISTANCE RATING
NLB **–/180/180**
FROM BOTH SIDES

FRR Basis: FR2539, FCO–0512, 99/1370, EWFA 27211–00



Side 1: 2x16mm fire resistant pbd
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 2x16mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	156	214	156	214
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_W		STC	
SS180.1A	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil	48	51	48	51
			50G11, 50P14	57	59	57	59
			75G11, 75P14	58	60	58	60
			90G11, 90P14	59	61	59	61
SS180.1B	2x16mm MULTISTOP	2x16mm MULTISTOP	Nil	49	52	49	52
			50G11, 50P14	58	59	58	59
			75G11, 75P14	59	60	59	60
			90G11, 90P14	60	61	60	61
SS180.1C	2x16mm FIRESTOP	2x16mm MULTISTOP	Nil	49	52	49	52
			50G11, 50P14	58	59	58	59
			75G11, 75P14	59	60	59	60
			90G11, 90P14	60	61	60	61

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

FIBEROCK – STAGGERED STUD

SSF30.1

FIRE RESISTANCE RATING
NLB **–/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396

ACOUSTIC RATINGS BASIS: SLR-FB-S-SS-01 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	118	176	118	176
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_w		STC	
SSF30.1A	1x13mm FIBEROCK	1x13mm FIBEROCK	Nil	41	44	40	43
			50G11, 50P14	51	52	50	53
			75G11, 75P14	53	54	52	55
			90G11, 90P14	54	55	53	56

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

Side 1: 1x13mm Fiberock
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 1x13mm Fiberock

SSF30.2

FIRE RESISTANCE RATING
NLB **–/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396

ACOUSTIC RATINGS BASIS: SLR-FB-S-SS-01 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	131	189	131	189
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_w		STC	
SSF30.2A	1x13mm FIBEROCK	2x13mm FIBEROCK	Nil	46	49	46	49
			50G11, 50P14	56	57	55	56
			75G11, 75P14	57	58	56	57
			90G11, 90P14	58	59	57	58

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

Side 1: 1x13mm Fiberock
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

SSF60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
FROM BOTH SIDES

FRR Basis: FAR2396

ACOUSTIC RATINGS BASIS: SLR-FB-S-SS-01 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	124	182	124	182
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_w		STC	
SSF60.1A	1x16mm FIBEROCK	1x16mm FIBEROCK	Nil	45	48	42	44
			50G11, 50P14	55	56	56	57
			75G11, 75P14	57	58	58	59
			90G11, 90P14	58	59	59	60

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

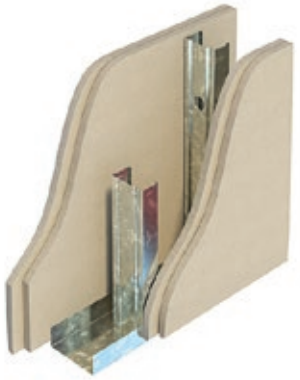
Side 1: 1x16mm Fiberock
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 1x16mm Fiberock

FIBEROCK – STAGGERED STUD

SSF90.1^

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FAR4405



ACOUSTIC RATINGS BASIS: SLR-FB-S-SS-01 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	144	202	144	202
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_W		STC	
SSF90.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil	52	55	51	54
			50G11, 50P14	60	63	60	62
			75G11, 75P14	62	64	62	63
			90G11, 90P14	63	65	63	64

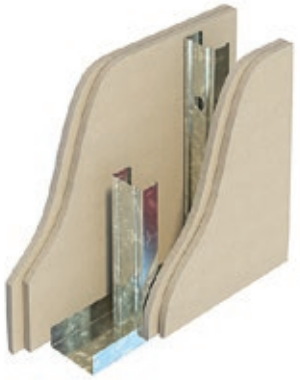
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m^3
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m^3
^ System SSF90.1 must utilise 51mm, 64mm or 75mm studs only

Side 1: 2x13mm Fiberock
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

SSF120.1^

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR4405



ACOUSTIC RATINGS BASIS: SLR-FB-S-SS-01 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	144	202	144	202
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_W		STC	
SSF120.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil	–	55	–	54
			50G11, 50P14	–	63	–	62
			75G11, 75P14	–	64	–	63
			90G11, 90P14	–	65	–	64

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m^3
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m^3
^ System SSF120.1 must utilise 92mm studs only

Side 1: 2x13mm Fiberock
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

SSF120.2

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR2396

ACOUSTIC RATINGS BASIS: SLR-FB-S-SS-01 — Based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	156	214	156	214
			TRACK SIZE mm	92	150	92	150
			INSULATION*	R_W		STC	
SSF120.2A	2x16mm FIBEROCK	2x16mm FIBEROCK	Nil	54	58	52	56
			50G11, 50P14	62	62	62	62
			75G11, 75P14	64	64	64	64
			90G11, 90P14	65	65	65	65

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m^3
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m^3

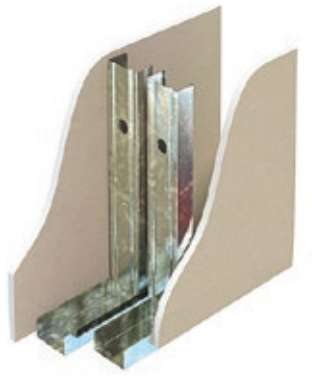
Side 1: 2x16mm Fiberock
Framing: Staggered steel studs
Insulation: Refer to table
Side 2: 2x16mm Fiberock

TWIN STUD

ST60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FR 2539, 99/1370, EWFA 27211–00



Side 1: 1x13mm fire resistant pbd
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 1x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03 — Based on studs @ 600mm ctrs

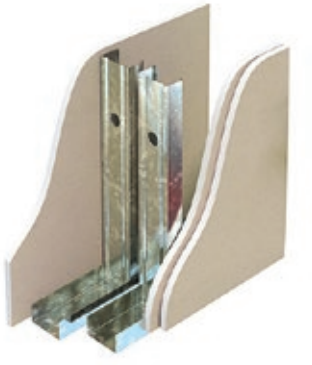
SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		174	197	230	346	174	197	230	346
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
ST60.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	Nil		43	44	46	47	44	45	47	48
			50G11, 50P14	One Side	53	54	54	55	54	55	55	56
			75G11, 75P14	One Side	–	54	54	55	–	55	55	56
			90G11, 90P14	One Side	–	–	55	55	–	–	56	56
			50G11, 50P14	Both Sides	56	57	57	58	57	58	58	59
			75G11, 75P14	Both Sides	–	57	57	58	–	58	58	59
			90G11, 90P14	Both Sides	–	–	58	58	–	–	59	59
ST60.1B	1x13mm MULTISTOP	1x13mm MULTISTOP	Nil		45	45	46	49	46	46	47	50
			50G11, 50P14	One Side	55	55	56	56	56	56	57	57
			75G11, 75P14	One Side	–	56	56	56	–	57	57	57
			90G11, 90P14	One Side	–	–	56	56	–	–	57	57
			50G11, 50P14	Both Sides	58	58	59	59	59	59	60	60
			75G11, 75P14	Both Sides	–	59	59	59	–	60	60	60
			90G11, 90P14	Both Sides	–	–	59	59	–	–	60	60
ST60.1C	1x13mm FIRESTOP	1x13mm MULTISTOP	Nil		44	45	45	48	45	46	46	49
			50G11, 50P14	One Side	54	55	55	56	55	56	56	57
			75G11, 75P14	One Side	–	55	55	56	–	56	56	57
			90G11, 90P14	One Side	–	–	56	56	–	–	57	57
			50G11, 50P14	Both Sides	57	58	58	59	58	59	59	60
			75G11, 75P14	Both Sides	–	58	58	59	–	59	59	60
			90G11, 90P14	Both Sides	–	–	59	59	–	–	60	60

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

ST90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: SI 515, FR 2539, 99/1370, EWFA 27211–00



Side 1: 1x13mm fire resistant pbd
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		187	210	243	359	187	210	243	359
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
ST90.1A	1x13mm FIRESTOP	2x13mm FIRESTOP	Nil		48	49	50	52	49	50	51	53
			50G11, 50P14	One Side	57	58	58	59	58	59	59	60
			75G11, 75P14	One Side	–	59	59	60	–	60	60	61
			90G11, 90P14	One Side	–	–	60	61	–	–	61	62
			50G11, 50P14	Both Sides	60	61	61	62	61	62	62	63
			75G11, 75P14	Both Sides	61	62	62	63	62	63	63	64
			90G11, 90P14	Both Sides	–	–	63	64	–	–	64	65
ST90.1B	1x13mm MULTISTOP	2x13mm MULTISTOP	Nil		50	51	52	55	51	52	53	56
			50G11, 50P14	One Side	60	60	61	61	61	61	62	62
			75G11, 75P14	One Side	–	61	62	62	–	62	63	63
			90G11, 90P14	One Side	–	–	63	63	–	–	64	64
			50G11, 50P14	Both Sides	63	63	64	64	64	64	65	65
			75G11, 75P14	Both Sides	64	64	65	65	65	65	66	66
			90G11, 90P14	Both Sides	–	–	66	66	–	–	67	67
ST90.1C	1x13mm FIRESTOP	2x13mm MULTISTOP	Nil		50	50	51	54	51	51	52	55
			50G11, 50P14	One Side	58	59	59	60	59	60	60	61
			75G11, 75P14	One Side	–	60	60	61	–	61	61	62
			90G11, 90P14	One Side	–	–	61	62	–	–	62	63
			50G11, 50P14	Both Sides	61	62	62	63	62	63	63	64
			75G11, 75P14	Both Sides	62	63	63	64	63	64	64	65
			90G11, 90P14	Both Sides	–	–	64	65	–	–	65	66

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

TWIN STUD

ST90.2

FIRE RESISTANCE RATING
NLB **–/90/90**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FR 2539, 99/1370, EWFA 27211–00

Side 1: 1x16mm fire resistant pbd
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 1x16mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

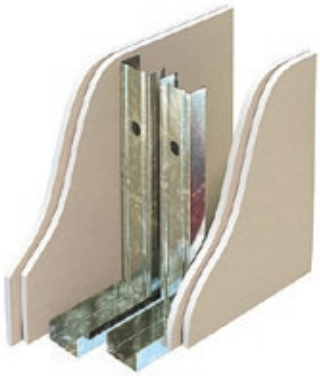
SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		180	203	236	352	180	203	236	352
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
ST90.2A	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil		46	47	48	51	47	48	49	52
			50G11, 50P14	One Side	55	55	56	56	56	56	57	57
			75G11, 75P14	One Side	–	56	57	57	–	57	58	58
			90G11, 90P14	One Side	–	–	58	58	–	–	59	59
			50G11, 50P14	Both Sides	58	58	59	59	59	59	60	60
			75G11, 75P14	Both Sides	59	59	60	60	60	60	61	61
			90G11, 90P14	Both Sides	–	–	61	61	–	–	62	62
ST90.2B	1x16mm MULTISTOP	1x16mm MULTISTOP	Nil		48	48	49	52	49	49	50	53
			50G11, 50P14	One Side	57	58	58	59	58	59	59	60
			75G11, 75P14	One Side	–	59	59	60	–	60	60	61
			90G11, 90P14	One Side	–	–	60	61	–	–	61	62
			50G11, 50P14	Both Sides	60	61	61	62	61	62	62	63
			75G11, 75P14	Both Sides	61	62	62	63	62	63	63	64
			90G11, 90P14	Both Sides	–	–	63	64	–	–	64	65
ST90.2C	1x16mm FIRESTOP	1x16mm MULTISTOP	Nil		47	48	49	51	48	49	50	52
			50G11, 50P14	One Side	56	57	57	58	57	58	58	59
			75G11, 75P14	One Side	–	58	58	59	–	59	59	60
			90G11, 90P14	One Side	–	–	59	60	–	–	60	61
			50G11, 50P14	Both Sides	59	60	60	61	60	61	61	62
			75G11, 75P14	Both Sides	60	61	61	62	61	62	62	63
			90G11, 90P14	Both Sides	–	–	62	63	–	–	63	64

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

ST120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
LB **90/90/90**
FROM BOTH SIDES

FRR Basis: FR 2539, 99/1370, EWFA 27211–00



Side 1: 2x13mm fire resistant pbd
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		200	223	256	372	200	223	256	372
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
ST120.1A	2x13mm FIRESTOP	2x13mm FIRESTOP	Nil		53	54	55	58	54	55	56	59
			50G11, 50P14	One Side	59	60	60	61	60	61	61	62
			75G11, 75P14	One Side	–	61	61	62	–	62	62	63
			90G11, 90P14	One Side	–	–	62	63	–	–	63	64
			50G11, 50P14	Both Sides	62	63	63	64	63	64	64	65
			75G11, 75P14	Both Sides	–	64	64	65	–	65	65	66
			90G11, 90P14	Both Sides	–	–	65	66	–	–	66	67
ST120.1B	2x13mm MULTISTOP	2x13mm MULTISTOP	Nil		55	56	57	60	56	57	58	61
			50G11, 50P14	One Side	61	62	62	63	62	63	63	64
			75G11, 75P14	One Side	–	63	63	64	–	64	64	65
			90G11, 90P14	One Side	–	–	64	65	–	–	65	66
			50G11, 50P14	Both Sides	64	65	65	66	65	66	66	67
			75G11, 75P14	Both Sides	–	66	66	67	–	67	67	68
			90G11, 90P14	Both Sides	–	–	67	68	–	–	68	69
ST120.1C	2x13mm FIRESTOP	2x13mm MULTISTOP	Nil		54	55	56	59	55	56	57	60
			50G11, 50P14	One Side	60	61	61	62	61	62	62	63
			75G11, 75P14	One Side	–	62	62	63	–	63	63	64
			90G11, 90P14	One Side	–	–	63	64	–	–	64	65
			50G11, 50P14	Both Sides	63	64	64	65	64	65	65	66
			75G11, 75P14	Both Sides	–	65	65	66	–	66	66	67
			90G11, 90P14	Both Sides	–	–	66	67	–	–	67	68

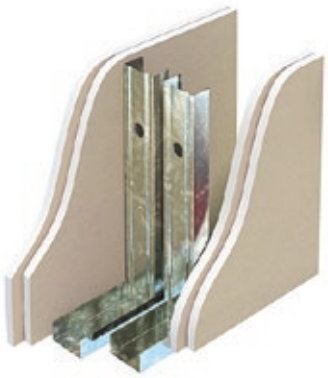
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

TWIN STUD

ST180.1

FIRE RESISTANCE RATING
NLB **–/180/180**
LB **120/120/120**
FROM BOTH SIDES

FRR Basis: FR 2539, 99/1370, EWFA 27211–00



Side 1: 2x16mm fire resistant pbd
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x16mm fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405–20S03

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		212	235	268	384	212	235	268	384
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_W				STC			
ST180.1A	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil		52	53	54	58	53	54	55	59
			50G11, 50P14	One Side	61	61	62	62	62	62	63	63
			75G11, 75P14	One Side	–	62	63	63	–	63	64	64
			90G11, 90P14	One Side	–	–	64	64	–	–	65	65
			50G11, 50P14	Both Sides	64	64	65	65	65	65	66	66
			75G11, 75P14	Both Sides	–	65	66	66	–	66	67	67
			90G11, 90P14	Both Sides	–	–	67	67	–	–	68	68
ST180.1B	2x16mm MULTISTOP	2x16mm MULTISTOP	Nil		53	54	55	59	54	55	56	60
			50G11, 50P14	One Side	61	62	62	63	62	63	63	64
			75G11, 75P14	One Side	–	63	63	64	–	64	64	65
			90G11, 90P14	One Side	–	–	64	65	–	–	65	66
			50G11, 50P14	Both Sides	64	65	65	66	65	66	66	67
			75G11, 75P14	Both Sides	–	66	66	67	–	67	67	68
			90G11, 90P14	Both Sides	–	–	67	68	–	–	68	69
ST180.1C	2x16mm FIRESTOP	2x16mm MULTISTOP	Nil		53	54	55	59	54	55	56	60
			50G11, 50P14	One Side	61	61	62	62	62	62	63	63
			75G11, 75P14	One Side	–	62	63	63	–	63	64	64
			90G11, 90P14	One Side	–	–	64	64	–	–	65	65
			50G11, 50P14	Both Sides	64	64	65	65	65	65	66	66
			75G11, 75P14	Both Sides	–	65	66	66	–	66	67	67
			90G11, 90P14	Both Sides	–	–	67	67	–	–	68	68

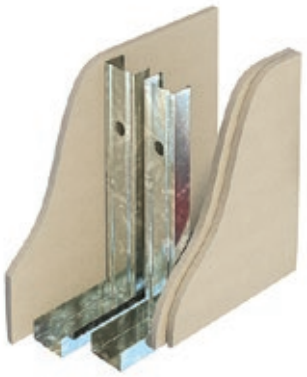
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

FIBEROCK – TWIN STUD

STF30.1

FIRE RESISTANCE RATING
NLB **–/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396



Side 1: 1x13mm Fiberock
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS BASIS: SLR-FB-S-DS-01

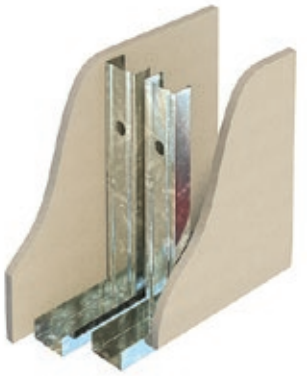
SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		187	210	243	359	187	210	243	359
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
STF30.1A	1x13mm FIBEROCK	2x13mm FIBEROCK	Nil		49	50	51	52	49	50	51	52
			50G11, 50P14	One Side	58	59	60	61	59	60	61	62
			75G11, 75P14	One Side	–	60	61	62	–	61	62	63
			90G11, 90P14	One Side	–	–	61	62	–	–	62	63
			50G11, 50P14	Both Sides	60	61	62	63	61	62	63	64
			75G11, 75P14	Both Sides	61	62	63	64	62	63	64	65
			90G11, 90P14	Both Sides	–	–	64	65	–	–	65	66

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

STF60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
FROM BOTH SIDES

FRR Basis: FAR2396



Side 1: 1x16mm Fiberock
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 1x16mm Fiberock

ACOUSTIC RATINGS BASIS: SLR-FB-S-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		180	203	236	352	180	203	236	352
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
STF60.1A	1x16mm FIBEROCK	1x16mm FIBEROCK	Nil		48	48	49	50	44	44	45	48
			50G11, 50P14	One Side	57	58	59	60	58	59	60	61
			75G11, 75P14	One Side	–	59	60	61	–	60	61	62
			90G11, 90P14	One Side	–	–	60	61	–	–	61	62
			50G11, 50P14	Both Sides	59	60	61	62	60	61	62	63
			75G11, 75P14	Both Sides	60	61	62	63	61	62	63	64
			90G11, 90P14	Both Sides	–	–	63	64	–	–	64	65

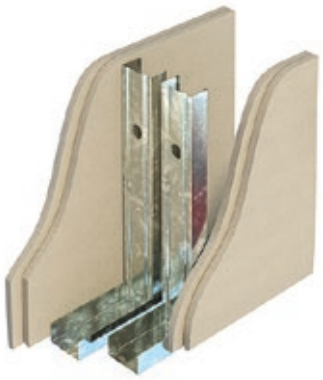
* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

FIBEROCK – TWIN STUD

STF90.1^

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FAR4405



Side 1: 2x13mm Fiberock
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS BASIS: SLR-FB-S-DS-01

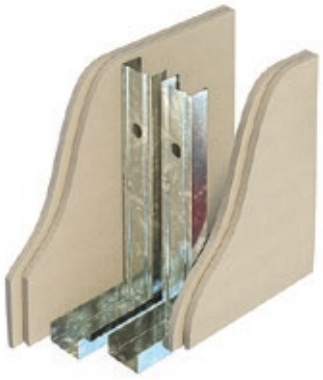
SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		200	223	256	372	200	223	256	372
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
STF90.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil		56	57	–	–	55	55	–	–
			50G11, 50P14	One Side	65	66	–	–	66	67	–	–
			75G11, 75P14	One Side	–	67	–	–	–	68	–	–
			90G11, 90P14	One Side	–	–	–	–	–	–	–	–
			50G11, 50P14	Both Sides	67	68	–	–	68	69	–	–
			75G11, 75P14	Both Sides	–	69	–	–	–	70	–	–
			90G11, 90P14	Both Sides	–	–	–	–	–	–	–	–

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³
^ System STF90.1 must utilise 64mm or 75mm studs only

STF120.1^

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR4405



Side 1: 2x13mm Fiberock
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS BASIS: SLR-FB-S-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		200	223	256	372	200	223	256	372
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
STF120.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil		–	–	57	58	–	–	55	55
			50G11, 50P14	One Side	–	–	67	68	–	–	68	69
			75G11, 75P14	One Side	–	–	68	69	–	–	69	70
			90G11, 90P14	One Side	–	–	68	69	–	–	69	70
			50G11, 50P14	Both Sides	–	–	69	70	–	–	70	71
			75G11, 75P14	Both Sides	–	–	70	71	–	–	71	72
			90G11, 90P14	Both Sides	–	–	71	72	–	–	72	73

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³
^ System STF120.1 must utilise 92mm or 150mm studs only

FIBEROCK – TWIN STUD

STF120.2

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR2396

Side 1: 2x16mm Fiberock
Framing: Twin steel studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x16mm Fiberock

ACOUSTIC RATINGS BASIS: SLR-FB-S-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		212	235	268	384	212	235	268	384
			STUD SIZE mm		64	75	92	150	64	75	92	150
			INSULATION*		R_w				STC			
STF120.2A	2x16mm FIBEROCK	2x16mm FIBEROCK	Nil		58	59	60	61	57	57	57	57
			50G11, 50P14	One Side	67	68	69	70	68	69	70	71
			75G11, 75P14	One Side	–	69	70	71	–	70	71	72
			90G11, 90P14	One Side	–	–	70	71	–	–	71	72
			50G11, 50P14	Both Sides	69	70	71	72	70	71	72	73
			75G11, 75P14	Both Sides	–	71	72	73	–	72	73	74
			90G11, 90P14	Both Sides	–	–	73	74	–	–	74	75

* **50/75/90G11** – 50/75/90mm glasswool insulation 11kg/m³
50/75/90P14 – 50/75/90mm polyester insulation 14kg/m³

TIMBER STUD WALLS

INTRODUCTION

DESCRIPTION

USG Boral timber stud wall systems consist of single or multiple layers of plasterboard, fixed to one or both sides of timber stud framing.

DESIGN OPTIONS

Timber stud wall systems outlined in this manual provide designers and builders with a wide range of options to suit project-specific requirements with regard to fire-rating, acoustic isolation, water resistance and impact resistance. A large number of hybrid systems have been included, providing cost-effective solutions where impact- and/or water- resistance requirements differ on each side of the wall.

Timber stud wall systems are available in non-fire-rated configurations with acoustic ratings up to STC 38 (R_w = 38), and in fire-rated configurations with FRRs up to 120/120/120 and acoustic ratings up to STC = 69 (R_w = 68).

The following types of timber stud wall systems are outlined in this manual:

- Lined one side
- Lined both sides
- Staggered stud
- Twin stud.

MATERIALS

PLASTERBOARD LININGS

- 10mm/13mm SHEETROCK plasterboard
- 13mm/16mm Fiberock
- 13mm/16mm Firestop plasterboard
- 10mm/13mm/16mm Multistop 4 plasterboard
- 10mm/13mm Soundstop plasterboard

TIMBER SECTIONS

- 70mm studs
- 90mm studs
- 90mm plates (staggered stud walls)
- 120mm plates (staggered stud walls)
- 140mm plates (staggered stud walls)

DEFLECTION HEAD TRACK

Deflection head track is used where allowance needs to be made for deflection of the floor/roof structure above a fire-rated timber stud wall system (refer to the Junctions and Penetrations section).

INSULATION

Glasswool

- 50mm 11kg/m^3 insulation
- R1.5 65mm insulation
- R2.0 90mm insulation

Polyester

- 50mm, 70mm and 90mm polyester insulation 14kg/m^3 density

SCREWS

Refer to the General Information – Fasteners Tables 2-4 for plasterboard screws suitable for timber-framed systems.

SEALANTS

H.B. Fuller Firesound™ sealant is recommended for use in USG Boral fire-rated and acoustic systems.

DESIGN CONSIDERATIONS

MAXIMUM HEIGHTS AND LOADS

Timber-framed walls must be designed in accordance with NZS 3604:2011 *Timber-framed buildings*.

In addition to design loads under normal service conditions, fire-rated timber-framed walls must be checked for maximum loads under the design fire exposure.

Maximum loads for fire-rated timber-framed walls depend on the extent of potential timber charring in a fire situation.

MULTI-RESIDENTIAL BUILDINGS

Separating walls in multi-residential buildings must satisfy NZBC fire-rating and acoustic requirements.

USG Boral Partiwall® is a family of NZBC compliant separating wall systems for attached dwellings.

For more information on USG Boral Partiwall separating walls, refer to the Partiwall® Installation Manual NZ and to **www.usgboral.com**

» INTRODUCTION

RESIDENTIAL BUILDINGS

The NZBC allows the use of timber-framed construction in low-rise multi-residential buildings (refer to NZS 3604 for height limitations on such buildings).

Various structural elements in these buildings must satisfy NZBC fire-rating and acoustic requirements.

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 FRR.

Where components by others are specified in USG Boral fire-rated penetration details (e.g., dampers, General Power Outlets (GPOs), 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.

INSTALLATION

Fire-rated and acoustic systems must be assembled strictly in accordance with the installation details and specifications outlined in this manual and in the relevant USG Boral publications in order to achieve stated FRR and acoustic ratings.

FRAMING

- Accurately mark wall layouts. Always check individual measurements against overall site dimensions.
- Cut timber studs to length, allowing for deflection of the floor/roof structure above.
- Use suitable fasteners and clips for anchoring the top and bottom plates. Locate fasteners 50mm from each end and spaced at maximum 600mm centres along the wall plate.
- Noggings are required as headers above doorways, for reinforcement behind fixture attachments, and where special circumstances require additional stiffening of the frame.

PLASTERBOARD APPLICATION

- Plasterboard linings can be installed vertically or horizontally. Refer to Figures 14-17 for optional plasterboard configurations in fire-rated timber stud walls.
- Cut plasterboard sheets to provide a 6-10mm maximum gap at ceiling (refer to the Junctions and Penetrations section for typical head and base details).
- Vertical sheet ends and edges in fire-rated systems are to fall on studs. Refer to Table 10 for minimum joint offsets in fire-rated systems.
- Fasten plasterboard sheets to timber framing with appropriate screws, as outlined in the General Information section. Place screws 10–16mm from sheet ends and edges.
- Refer to Table 11 for maximum screw spacings in fire-rated systems.
- Refer to the USG Boral Installation Manual for plasterboard fixing specifications for non-fire-rated timber stud wall systems.

TABLE 10: **MINIMUM JOINT OFFSETS** (mm)

LINING LAYER	VERTICAL JOINTS	HORIZONTAL JOINTS
Inner/single layers on opposite sides or Adjacent layers on same side	One stud spacing (300 min)	300

TABLE 11: **MAXIMUM SCREW SPACING** (mm)

LINING LAYER	INTERMEDIATE STUDS	VERTICAL EDGES, TOP AND BOTTOM PLATES	INTERNAL/EXTERNAL CORNERS & AROUND OPENINGS
Outer/single layer	300	200 (stagger screws in abutting sheets)	200
Inner layers	600	600	600

JOINTING AND FINISHING

- Finish all joints and internal and external corners in face layers with the appropriate USG Boral jointing system (refer to the USG Boral Installation Manual). Joints and junctions in inner layers of multiple-layer systems do not need to be stopped.
- SHEETROCK® paper tape must be used in fire-rated, bracing and wet area systems.
- Stop exposed fasteners on face layers.

CAULKING

Perimeter gaps and penetrations in fire-rated and acoustic systems must be caulked with an appropriate sealant (refer to the Junctions and Penetrations section).

DECORATION

Apply paint or other decorative finishes as required. Refer to USG Boral Plasterboard Installation Manual – Decorating Plasterboard Linings, for recommendations on decorating of plasterboard.

» INTRODUCTION

PLASTERBOARD INSTALLATION – FIRE-RATED WALLS

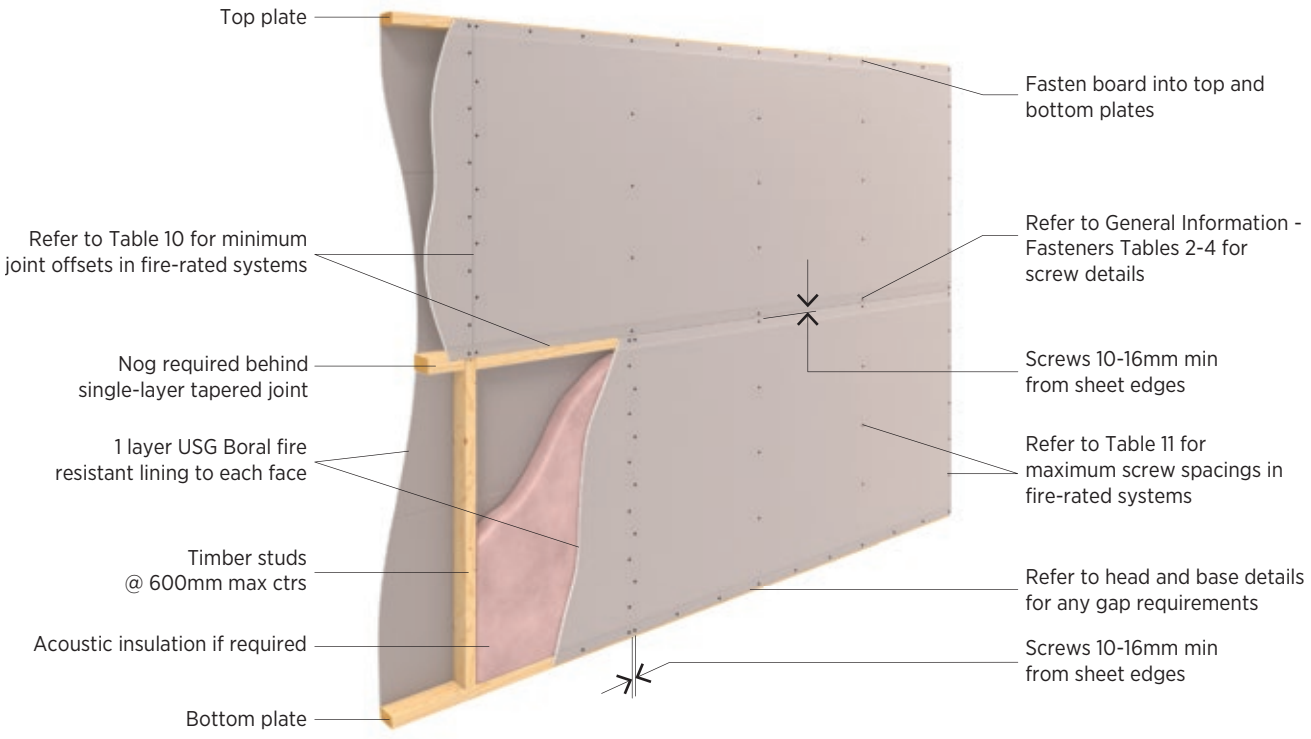


Figure 14: **Fire-rated Timber Stud – Horizontal Fixing – Single Layer**

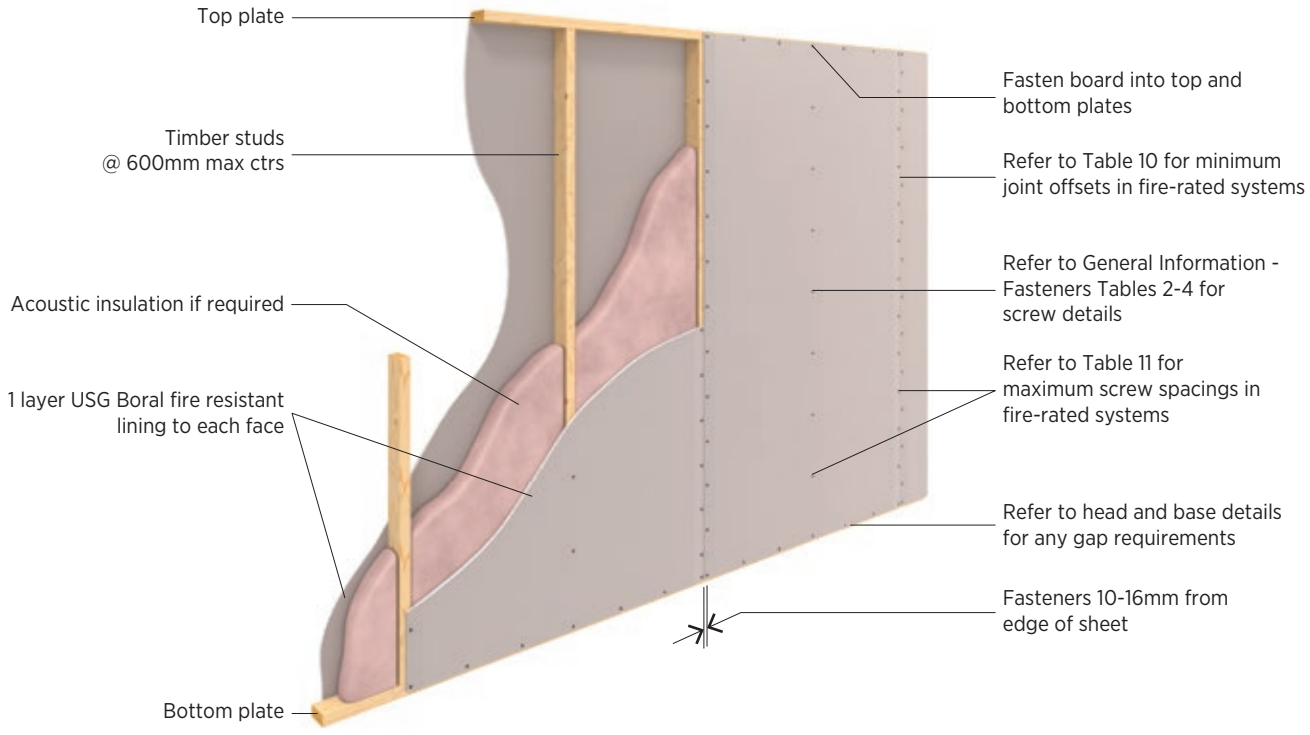


Figure 15: **Fire-rated Timber Stud – Vertical Fixing – Single Layer**

» INTRODUCTION

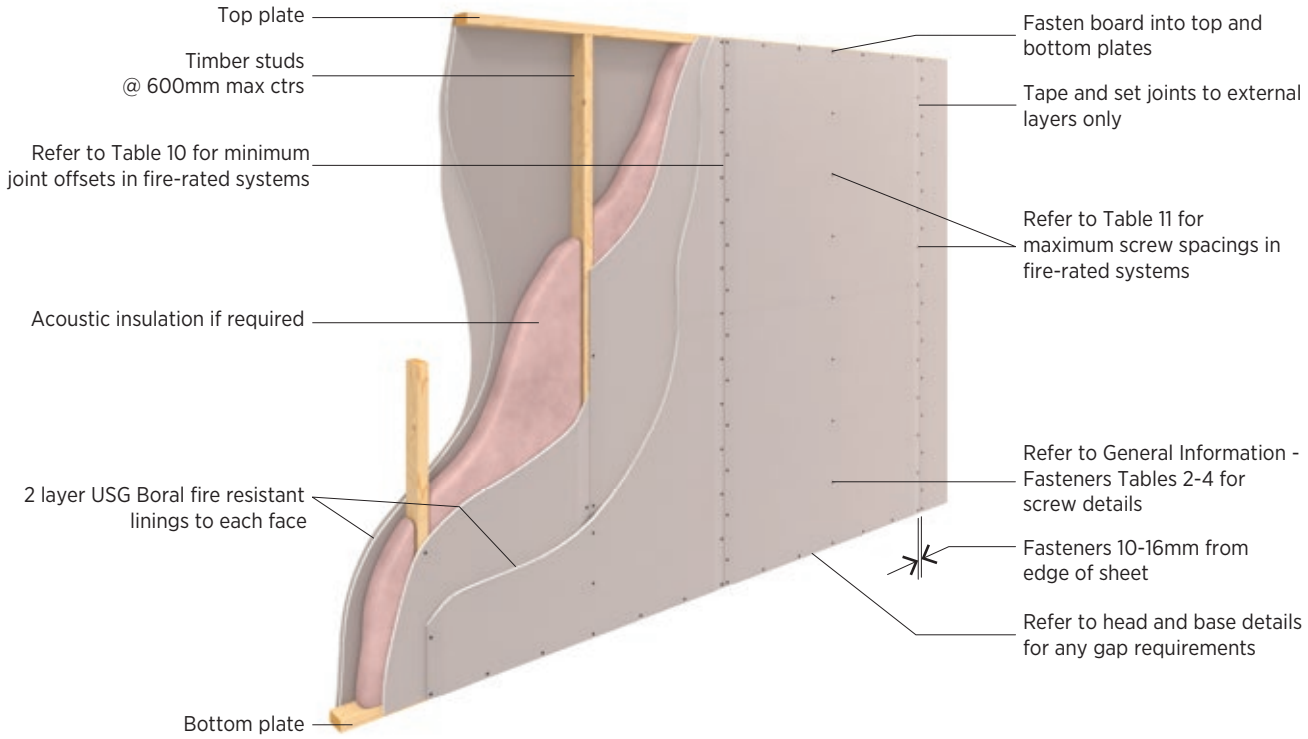


Figure 16: **Fire-rated Timber Stud – Vertical Fixing – Multiple Layer**

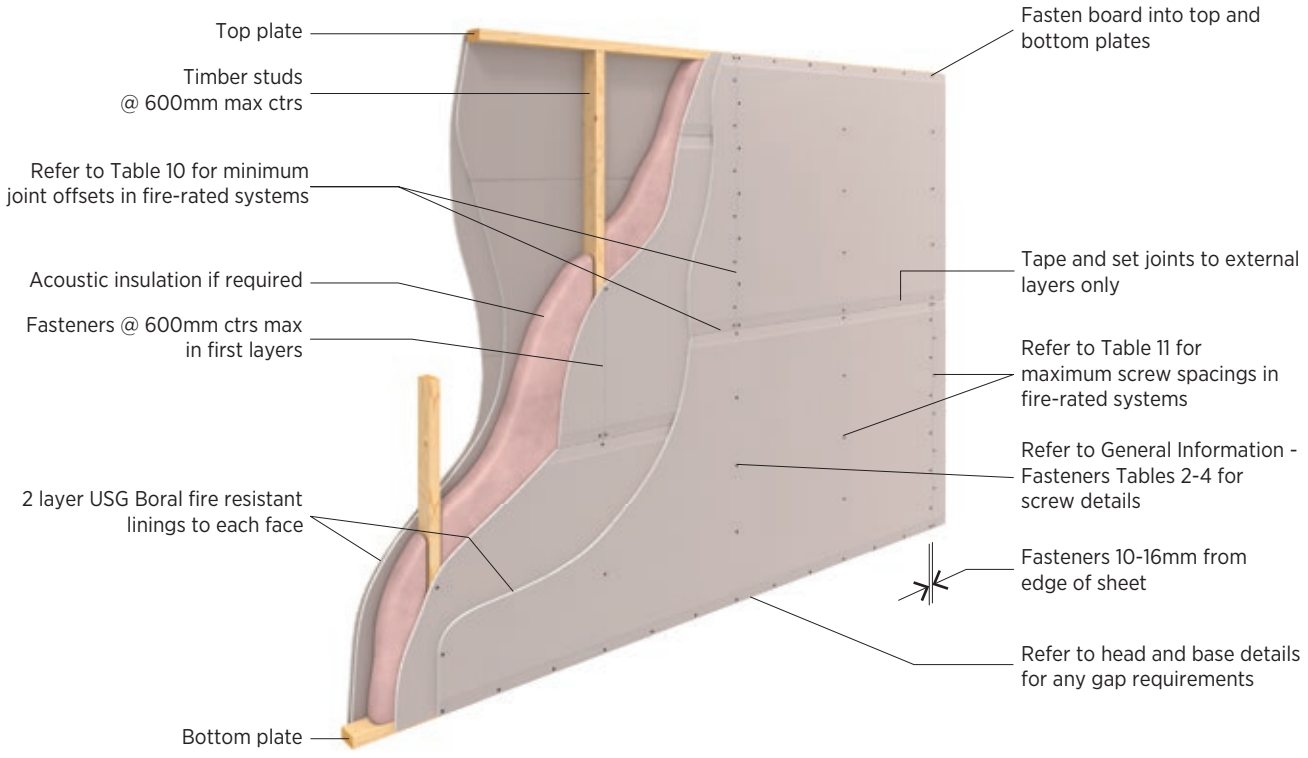


Figure 17: **Fire-rated Timber Stud – Horizontal Fixing – Multiple Layer**

QUICK SELECTION TABLES

WALLS LINED ONE SIDE Acoustic ratings are based on 600mm stud spacings

SYSTEM	PAGE NO	LINING SIDE 1	LINING SIDE 2	STUD SIZE mm	ANY STUD	
				FRR (from lining side only)	R_w	STC
TO.1	48	1x10mm non-fire resistant pbd	–	non-fire-rated	26-28	26-28
TO.2	48	2x10mm non-fire resistant pbd	–	non-fire-rated	32-34	32-34
TO.3	48	1x13mm non-fire resistant pbd	–	non-fire-rated	27-29	27-29
TO30.1	49	1x16mm fire resistant pbd	–	-/30/30	30	30
TO30.2	49	2x13mm fire resistant pbd	–	-/30/30	35	33-35
TO60.1	49	2x16mm fire resistant pbd	–	60/60/60	36	36
TO90.1	50	3x13mm fire resistant pbd	–	90/90/90	38-39	38-39
TO120.1	50	3x16mm fire resistant pbd	–	120/120/120	39-40	39-40
TOF.3	51	1x13mm FIBEROCK	–	non-fire-rated	29	29
TOF30.1	52	1x16mm FIBEROCK	–	-/30/30	30	30
TOF60.1	52	2x16mm FIBEROCK	–	-/60/60	36	35
TOF90.1	52	3x16mm FIBEROCK	–	-/90/90	40	40

QUICK SELECTION TABLES

WALLS LINED BOTH SIDES

Acoustic ratings are based on 600mm stud spacings

SYSTEM	PAGE NO	LINING SIDE 1	LINING SIDE 2	STUD SIZE mm	70	90	70	90
				FRR	R_W		STC	
TBS.1	53	1x10mm SHEETROCK	1x10mm SHEETROCK	non-fire-rated	27-35	28-36	27-35	28-36
TBS.2	53	1x13mm SHEETROCK	1x13mm SHEETROCK	non-fire-rated	29-37	30-38	29-37	30-38
TB45.1	53	1x10mm MULTISTOP 4	1x10mm MULTISTOP 4	45/45/45	32-40	33-41	32-40	33-41
TB60.1	54	1x13mm fire resistant pbd	1x13mm fire resistant pbd	-/60/60 30/30/30	32-41	33-42	32-41	33-42
TB60.2	54	1x13mm fire resistant pbd	2x13mm fire resistant pbd	-/60/60 30/30/30	39-44	39-45	39-44	39-45
TB60.3	55	1x16mm fire resistant pbd	1x16mm fire resistant pbd	-/60/60 60/60/60	34-42	34-42	34-42	34-42
TB90.1	55	2x13mm fire resistant pbd	2x13mm fire resistant pbd	-/90/90 90/90/90	39-48	40-48	39-48	40-48
TB120.1	56	2x16mm fire resistant pbd	2x16mm fire resistant pbd	-/120/120 120/120/120	41-48	41-48	41-48	41-48
TBF30.1	57	1x13mm FIBEROCK	1x13mm FIBEROCK	-/30/30 30/30/30	37-41	37-41	37-41	37-41
TBF30.2	57	1x13mm FIBEROCK	2x13mm FIBEROCK	-/30/30 30/30/30	39-43	39-43	39-43	39-43
TBF60.1	58	1x16mm FIBEROCK	1x16mm FIBEROCK	-/60/60 60/60/60	37-40	37-40	36-40	36-40
TBF90.1	59	2x13mm FIBEROCK	2x13mm FIBEROCK	-/90/90	40-44	41-44	41-44	42-44
TBF120.1	59	2x16mm FIBEROCK	2x16mm FIBEROCK	-/120/120	41-45	41-45	42-44	42-44

QUICK SELECTION TABLES

STAGGERED STUD WALLS Acoustic ratings are based on 600mm stud spacings

SYSTEM	PAGE NO	LINING SIDE 1	LINING SIDE 2	PLATE SIZE mm	90	120	140	90	120	140
				FRR	R_w			STC		
TS60.1	60	1x13mm fire resistant pbd	1x13mm fire resistant pbd	-/60/60 30/30/30	38-47	38-47	39-48	38-47	38-47	39-48
TS60.5	60	1x13mm fire resistant pbd	2x13mm fire resistant pbd	-/60/60 30/30/30	42-52	43-52	44-53	42-52	43-52	44-53
TS60.7	61	1x16mm fire resistant pbd	1x16mm fire resistant pbd	-/60/60 60/60/60	39-48	40-48	41-48	39-48	40-48	41-48
TS90.1	62	2x13mm fire resistant pbd	2x13mm fire resistant pbd	-/90/90 90/90/90	46-56	48-56	49-56	46-56	48-56	49-56
TS120.1	62	2x16mm fire resistant pbd	2x16mm fire resistant pbd	-/120/120 120/120/120	48-56	49-56	50-56	48-56	49-56	50-56
TSF30.1	63	1x13mm FIBEROCK	1x13mm FIBEROCK	-/30/30	41-49	42-50	43-51	41-48	41-49	42-51
TSF30.2	64	1x13mm FIBEROCK	2x13mm FIBEROCK	-/30/30 30/30/30	46-52	46-52	47-54	46-52	46-52	47-53
TSF60.1	64	1x16mm FIBEROCK	1x16mm FIBEROCK	-/60/60 60/60/60	44-50	45-51	46-52	43-50	43-51	43-52
TSF90.1	65	2x13mm FIBEROCK	2x13mm FIBEROCK	-/90/90	48-55	48-56	49-56	48-55	48-56	49-56
TSF120.1	65	2x16mm FIBEROCK	2x16mm FIBEROCK	-/120/120	49-55	49-56	50-56	49-55	49-56	50-56

QUICK SELECTION TABLES

TWIN STUD WALLS — Acoustic ratings are based on 600mm stud spacings

SYSTEM	PAGE NO	LINING SIDE 1	LINING SIDE 2	STUD SIZE mm	70	90	70	90
				FRR	R_W		STC	
TT60.1	66	1x13mm fire resistant pbd	1x13mm fire resistant pbd	-/60/60 30/30/30	41-58	42-59	42-59	43-60
TT60.5	67	1x13mm fire resistant pbd	2x13mm fire resistant pbd	-/60/60 30/30/30	46-61	47-63	47-62	48-64
TT60.6	68	1x16mm fire resistant pbd	1x16mm fire resistant pbd	-/60/60 60/60/60	44-61	45-63	45-62	46-64
TT90.1	69	2x13mm fire resistant pbd	2x13mm fire resistant pbd	-/90/90 90/90/90	51-65	52-67	52-66	53-68
TT120.1	70	2x16mm fire resistant pbd	2x16mm fire resistant pbd	-/120/120 120/120/120	50-66	51-67	51-67	52-68
TTF30.1	71	1x13mm FIBEROCK	1x13mm FIBEROCK	-/30/30	45-56	46-59	43-58	43-61
TTF30.2	71	1x13mm FIBEROCK	2x13mm FIBEROCK	-/30/30	49-61	51-64	49-62	51-65
TTF60.1	72	1x16mm FIBEROCK	1x16mm FIBEROCK	-/60/60 60/60/60	48-60	49-63	44-61	45-64
TTF90.1	72	2x13mm FIBEROCK	2x13mm FIBEROCK	-/90/90	56-68	57-71	55-69	55-72
TTF120.1	73	2x16mm FIBEROCK	2x16mm FIBEROCK	-/120/120	58-70	60-73	57-71	57-74

LINED ONE SIDE

TO.1

NON-FIRE-RATED

Side 1: 1x10mm non-fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	10 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO.1A	1x10mm SHEETROCK	NA	Nil	26	26
TO.1B	1x10mm SOUNDSTOP	NA	Nil	28	28

TO.2

NON-FIRE-RATED

Side 1: 2x10mm non-fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	20 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO.2A	2x10mm SHEETROCK	NA	Nil	32	32
TO.2B	2x10mm SOUNDSTOP	NA	Nil	34	34

TO.3

NON-FIRE-RATED

Side 1: 1x13mm non-fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	13 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO.3A	1x13mm SHEETROCK	NA	Nil	27	27
TO.3B	1x13mm SOUNDSTOP	NA	Nil	29	29

LINED ONE SIDE

TO30.1

FIRE RESISTANCE RATING -/30/30
FROM LINED SIDE ONLY

FRR Basis: FCO-1658, FCO-0568, EWFA 27211-00

Side 1: 1x16mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	16 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO30.1A	1x16mm FIRESTOP	NA	Nil	30	30
TO30.1B	1x16mm MULTISTOP	NA	Nil	30	30

TO30.2

FIRE RESISTANCE RATING -/30/30
FROM LINED SIDE ONLY

FRR Basis: FCO-1658, FCO-0568, EWFA 27211-00

Side 1: 2x13mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	26 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO30.2A	2x13mm FIRESTOP	NA	Nil	35	35
TO30.2B	2x13mm MULTISTOP	NA	Nil	35	35

TO60.1

FIRE RESISTANCE RATING 60/60/60
FROM LINED SIDE ONLY

FRR Basis: SI95, EWFA 27211-00

Side 1: 2x16mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	32 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO60.1A	2x16mm FIRESTOP	NA	Nil	36	36
TO60.1B	2x16mm MULTISTOP	NA	Nil	36	36

LINED ONE SIDE

TO90.1

FIRE RESISTANCE RATING 90/90/90
FROM LINED SIDE ONLY

FRR Basis: FCO-2423, EWFA 27211-00

Side 1: 3x13mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	39 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO90.1A	3x13mm FIRESTOP	NA	Nil	38	38
TO90.1B	3x13mm MULTISTOP	NA	Nil	39	39

TO120.1

FIRE RESISTANCE RATING 120/120/120
FROM LINED SIDE ONLY

FRR Basis: FSV-0538, EWFA 27211-00

Side 1: 3x16mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	48 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TO120.1A	3x16mm FIRESTOP	NA	Nil	39	39
TO120.1B	3x16mm MULTISTOP	NA	Nil	40	40

FIBEROCK – LINED ONE SIDE

TOF.3

NON-FIRE-RATED

Side 1: 1x13mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: SLR-FB-T-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	13 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
SOF.3A	1x13mm FIBEROCK	NA	Nil	29	29

FIBEROCK – LINED ONE SIDE

TOF30.1

FIRE RESISTANCE RATING
NLB **–/30/30**
FROM LINED SIDE ONLY

FRR Basis: FAR 3590

Side 1: 1x16mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: SLR-FB-T-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	16 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TOF30.1A	1x16mm FIBEROCK	NA	Nil	30	30

TOF60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
FROM LINED SIDE ONLY

FRR Basis: FAR 3590

Side 1: 2x16mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: SLR-FB-T-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	32 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TOF60.1A	2x16mm FIBEROCK	NA	Nil	36	35

TOF90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM LINED SIDE ONLY

FRR Basis: FAR 3590

Side 1: 3x16mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: NA

ACOUSTIC RATINGS BASIS: SLR-FB-T-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	48 + STUD	
			STUD SIZE mm	ANY STUD	
			INSULATION	R_w	STC
TOF90.1A	3x16mm FIBEROCK	NA	Nil	40	40

SHEETROCK BRAND – LINED BOTH SIDES

TBS.1

NON-FIRE-RATED

Side 1: 1x10mm non-fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 1x10mm non-fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	90	110	90	110
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_W		STC	
TBS.1A	1x10mm SHEETROCK	1x10mm SHEETROCK	Nil	27	28	27	28
			50G11, 50P14	34	35	34	35
			R1.5, 70P14	35	36	35	36
			R2.0, 90P14	-	36	-	36

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TBS.2

NON-FIRE-RATED

Side 1: 1x13mm non-fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 1x13mm non-fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	96	116	96	116
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_W		STC	
TBS.2A	1x13mm SHEETROCK	1x13mm SHEETROCK	Nil	29	30	29	30
			50G11, 50P14	36	37	36	37
			R1.5, 70P14	37	38	37	38
			R2.0, 90P14	-	38	-	38

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

LINED BOTH SIDES

TB45.1

FIRE RESISTANCE RATING
LB **45/45/45**
FROM BOTH SIDES

FRR Basis: FR 6123

Side 1: 1x10mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 1x10mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	90	110	90	110
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_W		STC	
TB45.1A	1x10mm MULTISTOP 4	1x10mm MULTISTOP 4	Nil	32	33	32	33
			50G11, 50P14	39	40	39	40
			R1.5, 70P14	40	41	40	41
			R2.0, 90P14	-	41	-	41

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

LINED BOTH SIDES

TB60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FCO-2393, WFRA 460081, WFRA C91550, EWFA 27211-00

Side 1: 1x13mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 1x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	96	116	96	116
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TB60.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	Nil	32	33	32	33
			50G11, 50P14	40	40	40	40
			R1.5, 70P14	41	41	41	41
			R2.0, 90P14	-	41	-	41
TB60.1B	1x13mm MULTISTOP	1x13mm MULTISTOP	Nil	33	34	33	34
			50G11, 50P14	40	40	40	40
			R1.5, 70P14	41	41	41	41
			R2.0, 90P14	-	42	-	42
TB60.1C	1x13mm FIRESTOP	1x13mm MULTISTOP	Nil	33	34	33	34
			50G11, 50P14	40	40	40	40
			R1.5, 70P14	41	41	41	41
			R2.0, 90P14	-	41	-	41

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TB60.2

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FCO-2393, WFRA 460081, WFRA C91550, EWFA 27211-00

Side 1: 1x13mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	109	129	109	129
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TB60.2A	1x13mm FIRESTOP	2x13mm FIRESTOP	Nil	39	39	39	39
			50G11, 50P14	44	44	44	44
			R1.5, 70P14	44	44	44	44
			R2.0, 90P14	-	45	-	45
TB60.2B	1x13mm MULTISTOP	2x13mm MULTISTOP	Nil	39	40	39	40
			50G11, 50P14	44	44	44	44
			R1.5, 70P14	44	44	44	44
			R2.0, 90P14	-	45	-	45
TB60.2C	1x13mm FIRESTOP	2x13mm MULTISTOP	Nil	39	40	39	40
			50G11, 50P14	44	44	44	44
			R1.5, 70P14	44	44	44	44
			R2.0, 90P14	-	45	-	45

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

LINED BOTH SIDES

TB60.3

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: WFRA C91202, FCO-0619, FCO-0626, EWFA 27211-00

Side 1: 1x16mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 1x16mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	102	122	102	122
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TB60.3A	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil	34	34	34	34
			50G11, 50P14	41	41	41	41
			R1.5, 70P14	42	42	42	42
			R2.0, 90P14	-	42	-	42
TB60.3B	1x16mm MULTISTOP	1x16mm MULTISTOP	Nil	34	35	34	35
			50G11, 50P14	41	41	41	41
			R1.5, 70P14	42	42	42	42
			R2.0, 90P14	-	42	-	42
TB60.3C	1x16mm FIRESTOP	1x16mm MULTISTOP	Nil	34	35	34	35
			50G11, 50P14	41	41	41	41
			R1.5, 70P14	42	42	42	42
			R2.0, 90P14	-	42	-	42

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TB90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
LB **90/90/90**
FROM BOTH SIDES

FRR Basis: FCO-2564, 91/103 EWFA 27211-00

Side 1: 2x13mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	122	142	122	142
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TB90.1A	2x13mm FIRESTOP	2x13mm FIRESTOP	Nil	39	40	39	40
			50G11, 50P14	48	48	48	48
			R1.5, 70P14	48	48	48	48
			R2.0, 90P14	-	48	-	48
TB90.1B	2x13mm MULTISTOP	2x13mm MULTISTOP	Nil	40	40	40	40
			50G11, 50P14	48	48	48	48
			R1.5, 70P14	48	48	48	48
			R2.0, 90P14	-	48	-	48
TB90.1C	2x13mm FIRESTOP	2x13mm MULTISTOP	Nil	40	40	40	40
			50G11, 50P14	48	48	48	48
			R1.5, 70P14	48	48	48	48
			R2.0, 90P14	-	48	-	48

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

LINED BOTH SIDES

TB120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
LB **120/120/120**
FROM BOTH SIDES

FRR Basis: FCO-2564, EWFA 27211-00

Side 1: 2x16mm fire resistant pbd
Framing: Timber studs
Insulation: Refer to table
Side 2: 2x16mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	134	154	134	154
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TB120.1A	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil	41	41	41	41
			50G11, 50P14	48	48	48	48
			R1.5, 70P14	48	48	48	48
			R2.0, 90P14	-	48	-	48
TB120.1B	2x16mm MULTISTOP	2x16mm MULTISTOP	Nil	41	41	41	41
			50G11, 50P14	48	48	48	48
			R1.5, 70P14	48	48	48	48
			R2.0, 90P14	-	48	-	48
TB120.1C	2x16mm FIRESTOP	2x16mm MULTISTOP	Nil	41	41	41	41
			50G11, 50P14	48	48	48	48
			R1.5, 70P14	48	48	48	48
			R2.0, 90P14	-	48	-	48

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – LINED BOTH SIDES

TBF30.1

FIRE RESISTANCE RATING
NLB **–/30/30**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FR3242, FAR2236

Side 1: 1x13mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: 1x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-S-01

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	96	116	96	116
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TBF30.1A	1x13mm FIBEROCK	1x13mm FIBEROCK	Nil	37	37	37	37
			50G11, 50P14	41	41	41	41
			R1.5, 70P14	41	41	41	41
			R2.0, 90P14	-	41	-	41

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TBF30.2

FIRE RESISTANCE RATING
NLB **–/30/30**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396

Side 1: 1x13mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-S-01

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	109	129	109	129
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TBF30.2A	1x13mm FIBEROCK	2x13mm FIBEROCK	Nil	39	39	39	39
			50G11, 50P14	43	43	43	43
			R1.5, 70P14	43	43	43	43
			R2.0, 90P14	-	43	-	43

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – LINED BOTH SIDES

TBF60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FAR2339

Side 1: 1x16mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: 1x16mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-S-01

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	102	122	102	122
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TBF60.1A	1x16mm FIBEROCK	1x16mm FIBEROCK	Nil	37	37	36	36
			50G11, 50P14	40	40	40	40
			R1.5, 70P14	40	40	40	40
			R2.0, 90P14	-	40	-	40

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – LINED BOTH SIDES

TBF90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FAR4405

Side 1: 2x13mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-S-01

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	122	142	122	142
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TBF90.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil	40	41	41	42
			50G11, 50P14	44	44	44	44
			R1.5, 70P14	44	44	44	44
			R2.0, 90P14	-	44	-	44

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TBF120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR2364

Side 1: 2x16mm Fiberock
Framing: Timber studs
Insulation: Refer to table
Side 2: 2x16mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-S-01

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	134	154	134	154
			STUD SIZE mm	70	90	70	90
			INSULATION*	R_w		STC	
TBF120.1A	2x16mm FIBEROCK	2x16mm FIBEROCK	Nil	41	41	42	42
			50G11, 50P14	45	45	44	44
			R1.5, 70P14	45	45	44	44
			R2.0, 90P14	-	45	-	44

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

STAGGERED STUD

TS60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FCO-2393, EWFA 27211-00

Side 1: 1x13mm fire resistant pbd
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 1x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	116	146	166	116	146	166
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TS60.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	Nil	38	38	39	38	38	39
			50G11, 50P14	45	46	46	45	46	46
			R1.5, 70P14	46	47	47	46	47	47
			R2.0, 90P14	46	47	47	46	47	47
TS60.1B	1x13mm MULTISTOP	1x13mm MULTISTOP	Nil	38	39	40	38	39	40
			50G11, 50P14	46	46	46	46	46	46
			R1.5, 70P14	47	47	48	47	47	48
			R2.0, 90P14	47	47	48	47	47	48
TS60.1C	1x13mm FIRESTOP	1x13mm MULTISTOP	Nil	38	39	40	38	39	40
			50G11, 50P14	45	46	46	45	46	46
			R1.5, 70P14	46	47	47	46	47	47
			R2.0, 90P14	46	47	47	46	47	47

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation. **R2.0** – R2.0 90mm insulation.
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TS60.5

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FCO-2393, EWFA 27211-00

Side 1: 1x13mm fire resistant pbd
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	129	159	179	129	159	179
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TS60.5A	1x13mm FIRESTOP	2x13mm FIRESTOP	Nil	42	43	44	42	43	44
			50G11, 50P14	49	50	50	49	50	50
			R1.5, 70P14	50	51	51	50	51	51
			R2.0, 90P14	51	52	52	51	52	52
TS60.5B	1x13mm MULTISTOP	2x13mm MULTISTOP	Nil	43	44	44	43	44	44
			50G11, 50P14	50	50	51	50	50	51
			R1.5, 70P14	51	51	52	51	51	52
			R2.0, 90P14	52	52	53	52	52	53
TS60.5C	1x13mm FIRESTOP	2x13mm MULTISTOP	Nil	42	44	44	42	44	44
			50G11, 50P14	50	50	51	50	50	51
			R1.5, 70P14	51	51	52	51	51	52
			R2.0, 90P14	52	52	53	52	52	53

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

STAGGERED STUD

TS60.7

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FCO-0626, EWFA 27211-00

Side 1: 1x16mm fire resistant pbd
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 1x16mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	122	152	172	122	152	172
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TS60.7A	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil	39	40	41	39	40	41
			50G11, 50P14	46	47	47	46	47	47
			R1.5, 70P14	47	48	48	47	48	48
			R2.0, 90P14	47	48	48	47	48	48
TS60.7B	1x16mm MULTISTOP	1x16mm MULTISTOP	Nil	39	41	41	39	41	41
			50G11, 50P14	46	47	47	46	47	47
			R1.5, 70P14	48	48	48	48	48	48
			R2.0, 90P14	48	48	48	48	48	48
TS60.7C	1x16mm FIRESTOP	1x16mm MULTISTOP	Nil	39	41	41	39	41	41
			50G11, 50P14	46	47	47	46	47	47
			R1.5, 70P14	47	48	48	47	48	48
			R2.0, 90P14	47	48	48	47	48	48

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

STAGGERED STUD

TS90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
LB **90/90/90**
FROM BOTH SIDES

FRR Basis: FCO-2564, EWFA 27211-00

Side 1: 2x13mm fire resistant pbd
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	142	172	192	142	172	192
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TS90.1A	2x13mm FIRESTOP	2x13mm FIRESTOP	Nil	46	48	49	46	48	49
			50G11, 50P14	54	54	54	54	54	54
			R1.5, 70P14	55	55	55	55	55	55
			R2.0, 90P14	56	56	56	56	56	56
TS90.1B	2x13mm MULTISTOP	2x13mm MULTISTOP	Nil	47	48	49	47	48	49
			50G11, 50P14	54	54	54	54	54	54
			R1.5, 70P14	55	55	55	55	55	55
			R2.0, 90P14	56	56	56	56	56	56
TS90.1C	2x13mm FIRESTOP	2x13mm MULTISTOP	Nil	47	48	49	47	48	49
			50G11, 50P14	54	54	54	54	54	54
			R1.5, 70P14	55	55	55	55	55	55
			R2.0, 90P14	56	56	56	56	56	56

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TS120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
LB **120/120/120**
FROM BOTH SIDES

FRR Basis: FCO-2564, EWFA 27211-00

Side 1: 2x16mm fire resistant pbd
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 2x16mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	154	184	204	154	184	204
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TS120.1A	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil	48	49	50	48	49	50
			50G11, 50P14	54	54	54	54	54	54
			R1.5, 70P14	55	55	55	55	55	55
			R2.0, 90P14	56	56	56	56	56	56
TS120.1B	2x16mm MULTISTOP	2x16mm MULTISTOP	Nil	48	49	50	48	49	50
			50G11, 50P14	54	54	54	54	54	54
			R1.5, 70P14	55	55	55	55	55	55
			R2.0, 90P14	56	56	56	56	56	56
TS120.1C	2x16mm FIRESTOP	2x16mm MULTISTOP	Nil	48	49	50	48	49	50
			50G11, 50P14	54	54	54	54	54	54
			R1.5, 70P14	55	55	55	55	55	55
			R2.0, 90P14	56	56	56	56	56	56

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – STAGGERED STUD

TSF30.1

FIRE RESISTANCE RATING
NLB **–/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396

Side 1: 1x13mm Fiberock
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 1x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-SS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	116	146	166	116	146	166
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TSF30.1A	1x13mm FIBEROCK	1x13mm FIBEROCK	Nil	41	42	43	41	41	42
			50G11, 50P14	46	47	48	45	47	48
			R1.5, 70P14	48	49	50	47	48	50
			R2.0, 90P14	49	50	51	48	49	51

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – STAGGERED STUD

TSF30.2

FIRE RESISTANCE RATING
NLB **–/30/30**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396

Side 1: 1x13mm Fiberock
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-SS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	129	159	179	129	159	179
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TSF30.2A	1x13mm FIBEROCK	2x13mm FIBEROCK	Nil	46	46	47	46	46	47
			50G11, 50P14	50	50	51	50	50	51
			R1.5, 70P14	51	51	52	51	51	51
			R2.0, 90P14	52	52	54	52	52	53

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TSF60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FAR2418

Side 1: 1x16mm Fiberock
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 1x16mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-SS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	122	152	172	122	152	172
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TSF60.1A	1x16mm FIBEROCK	1x16mm FIBEROCK	Nil	44	45	46	43	43	43
			50G11, 50P14	48	49	50	48	49	50
			R1.5, 70P14	49	51	51	49	51	51
			R2.0, 90P14	50	51	52	50	51	52

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – STAGGERED STUD

TSF90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FAR 4405

Side 1: 2x13mm Fiberock
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-SS-01

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	142	172	192	142	172	192
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TSF90.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil	48	48	49	48	48	49
			50G11, 50P14	52	53	55	52	53	54
			R1.5, 70P14	54	55	56	55	55	56
			R2.0, 90P14	55	56	56	55	56	56

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TSF120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR2396, FAR2364

Side 1: 2x16mm Fiberock
Framing: Staggered timber studs
Insulation: Refer to table
Side 2: 2x16mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-SS-01

Acoustic ratings are based on studs @ 600mm ctrs

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	154	184	204	154	184	204
			PLATE SIZE mm	90	120	140	90	120	140
			INSULATION*	R_w			STC		
TSF120.1A	2x16mm FIBEROCK	2x16mm FIBEROCK	Nil	49	49	50	49	49	50
			50G11, 50P14	53	53	55	52	53	54
			R1.5, 70P14	55	55	56	55	55	56
			R2.0, 90P14	55	56	56	55	56	56

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TWIN STUD

TT60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FCO-2393, EWFA 27211-00

Side 1: 1x13mm fire resistant pbd
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 1x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		186	226	186	226
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TT60.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	Nil		41	42	42	43
			50G11, 50P14	One Side	54	54	55	55
			R1.5, 70P14	One Side	54	54	55	55
			R2.0, 90P14	One Side	-	55	-	56
			50G11, 50P14	Both Sides	57	57	58	58
			R1.5, 70P14	Both Sides	57	57	58	58
			R2.0, 90P14	Both Sides	-	58	-	59
TT60.1B	1x13mm MULTISTOP	1x13mm MULTISTOP	Nil		42	43	43	44
			50G11, 50P14	One Side	55	56	56	57
			R1.5, 70P14	One Side	55	56	56	57
			R2.0, 90P14	One Side	-	56	-	57
			50G11, 50P14	Both Sides	58	59	59	60
			R1.5, 70P14	Both Sides	58	59	59	60
			R2.0, 90P14	Both Sides	-	59	-	60
TT60.1C	1x13mm FIRESTOP	1x13mm MULTISTOP	Nil		42	43	43	44
			50G11, 50P14	One Side	55	55	56	56
			R1.5, 70P14	One Side	55	56	56	57
			R2.0, 90P14	One Side	-	56	-	57
			50G11, 50P14	Both Sides	58	58	59	59
			R1.5, 70P14	Both Sides	58	59	59	60
			R2.0, 90P14	Both Sides	-	59	-	60

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TWIN STUD

TT60.5

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FCO-2393, EWFA 27211-00

Side 1: 1x13mm fire resistant pbd
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		199	239	199	239
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TT60.5A	1x13mm FIRESTOP	2x13mm FIRESTOP	Nil		46	47	47	48
			50G11, 50P14	One Side	56	56	57	57
			R1.5, 70P14	One Side	57	57	58	58
			R2.0, 90P14	One Side	-	59	-	60
			50G11, 50P14	Both Sides	59	59	60	60
			R1.5, 70P14	Both Sides	60	60	61	61
			R2.0, 90P14	Both Sides	-	62	-	63
TT60.5B	1x13mm MULTISTOP	2x13mm MULTISTOP	Nil		47	48	48	49
			50G11, 50P14	One Side	57	58	58	59
			R1.5, 70P14	One Side	58	59	59	60
			R2.0, 90P14	One Side	-	60	-	61
			50G11, 50P14	Both Sides	60	61	61	62
			R1.5, 70P14	Both Sides	61	62	62	63
			R2.0, 90P14	Both Sides	-	63	-	64
TT60.5C	1x13mm FIRESTOP	2x13mm MULTISTOP	Nil		47	48	48	49
			50G11, 50P14	One Side	57	57	58	58
			R1.5, 70P14	One Side	58	59	59	60
			R2.0, 90P14	One Side	-	60	-	61
			50G11, 50P14	Both Sides	60	60	61	61
			R1.5, 70P14	Both Sides	61	62	62	63
			R2.0, 90P14	Both Sides	-	63	-	64

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TWIN STUD

TT60.6

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FCO-0626, EWFA 27211-00

Side 1: 1x16mm fire resistant pbd
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 1x16mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		192	232	192	232
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TT60.6A	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil		44	45	45	46
			50G11, 50P14	One Side	55	56	56	57
			R1.5, 70P14	One Side	57	57	58	58
			R2.0, 90P14	One Side	-	59	-	60
			50G11, 50P14	Both Sides	58	59	59	60
			R1.5, 70P14	Both Sides	60	60	61	61
			R2.0, 90P14	Both Sides	-	62	-	63
TT60.6B	1x16mm MULTISTOP	1x16mm MULTISTOP	Nil		44	45	45	46
			50G11, 50P14	One Side	57	57	58	58
			R1.5, 70P14	One Side	58	59	59	60
			R2.0, 90P14	One Side	-	60	-	61
			50G11, 50P14	Both Sides	60	60	61	61
			R1.5, 70P14	Both Sides	61	62	62	63
			R2.0, 90P14	Both Sides	-	63	-	64
TT60.6C	1x16mm FIRESTOP	1x16mm MULTISTOP	Nil		44	45	45	46
			50G11, 50P14	One Side	56	57	57	58
			R1.5, 70P14	One Side	57	58	58	59
			R2.0, 90P14	One Side	-	59	-	60
			50G11, 50P14	Both Sides	59	60	60	61
			R1.5, 70P14	Both Sides	60	61	61	62
			R2.0, 90P14	Both Sides	-	62	-	63

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TWIN STUD

TT90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
LB **90/90/90**
FROM BOTH SIDES

FRR Basis: FCO-2564, EWFA 27211-00

Side 1: 2x13mm fire resistant pbd
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		212	252	212	252
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TT90.1A	2x13mm FIRESTOP	2x13mm FIRESTOP	Nil		51	52	52	53
			50G11, 50P14	One Side	60	60	61	61
			R1.5, 70P14	One Side	61	61	62	62
			R2.0, 90P14	One Side	-	62	-	63
			50G11, 50P14	Both Sides	63	63	64	64
			R1.5, 70P14	Both Sides	64	64	65	65
			R2.0, 90P14	Both Sides	-	65	-	66
TT90.1B	2x13mm MULTISTOP	2x13mm MULTISTOP	Nil		52	53	53	54
			50G11, 50P14	One Side	61	62	62	63
			R1.5, 70P14	One Side	62	63	63	64
			R2.0, 90P14	One Side	-	64	-	65
			50G11, 50P14	Both Sides	64	65	65	66
			R1.5, 70P14	Both Sides	65	66	66	67
			R2.0, 90P14	Both Sides	-	67	-	68
TT90.1C	2x13mm FIRESTOP	2x13mm MULTISTOP	Nil		52	53	53	54
			50G11, 50P14	One Side	61	61	62	62
			R1.5, 70P14	One Side	62	62	63	63
			R2.0, 90P14	One Side	-	63	-	64
			50G11, 50P14	Both Sides	64	64	65	65
			R1.5, 70P14	Both Sides	65	65	66	66
			R2.0, 90P14	Both Sides	-	66	-	67

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TWIN STUD

TT120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
LB **120/120/120**
FROM BOTH SIDES

FRR Basis: FCO-2564, EWFA 27211-00

Side 1: 2x16mm fire resistant pbd
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x16mm fire resistant pbd

ACOUSTIC RATINGS RT&A TE405-20S04

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		224	264	224	264
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TT120.1A	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil		50	51	51	52
			50G11, 50P14	One Side	61	61	62	62
			R1.5, 70P14	One Side	62	62	63	63
			R2.0, 90P14	One Side	-	63	-	64
			50G11, 50P14	Both Sides	64	64	65	65
			R1.5, 70P14	Both Sides	65	65	66	66
			R2.0, 90P14	Both Sides	-	66	-	67
TT120.1B	2x16mm MULTISTOP	2x16mm MULTISTOP	Nil		51	52	52	53
			50G11, 50P14	One Side	62	62	63	63
			R1.5, 70P14	One Side	63	63	64	64
			R2.0, 90P14	One Side	-	64	-	65
			50G11, 50P14	Both Sides	65	65	66	66
			R1.5, 70P14	Both Sides	66	66	67	67
			R2.0, 90P14	Both Sides	-	67	-	68
TT120.1C	2x16mm FIRESTOP	2x16mm MULTISTOP	Nil		51	52	52	53
			50G11, 50P14	One Side	61	62	62	63
			R1.5, 70P14	One Side	62	63	63	64
			R2.0, 90P14	One Side	-	64	-	65
			50G11, 50P14	Both Sides	64	65	65	66
			R1.5, 70P14	Both Sides	65	66	66	67
			R2.0, 90P14	Both Sides	-	67	-	68

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – TWIN STUD

TTF30.1

FIRE RESISTANCE RATING
NLB **–/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396

Side 1: 1x13mm Fiberock
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 1x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		186	226	186	226
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TTF30.1A	1x13mm FIBEROCK	1x13mm FIBEROCK	Nil		45	46	43	43
			50G11, 50P14	One Side	53	55	55	57
			R1.5, 70P14	One Side	54	56	56	58
			R2.0, 90P14	One Side	-	56	-	58
			50G11, 50P14	Both Sides	55	57	57	59
			R1.5, 70P14	Both Sides	56	58	58	60
			R2.0, 90P14	Both Sides	-	59	-	61

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TTF30.2

FIRE RESISTANCE RATING
NLB **–/30/30**
FROM BOTH SIDES

FRR Basis: FAR2396

Side 1: 1x13mm Fiberock
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		199	239	199	239
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TTF30.2A	1x13mm FIBEROCK	2x13mm FIBEROCK	Nil		49	51	49	51
			50G11, 50P14	One Side	58	60	59	61
			R1.5, 70P14	One Side	59	61	60	62
			R2.0, 90P14	One Side	-	61	-	62
			50G11, 50P14	Both Sides	60	62	61	63
			R1.5, 70P14	Both Sides	61	63	62	64
			R2.0, 90P14	Both Sides	-	64	-	65

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – TWIN STUD

TTF60.1

FIRE RESISTANCE RATING
NLB **–/60/60**
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FAR2418

Side 1: 1x16mm Fiberock
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 1x16mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		192	232	192	232
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TTF60.1A	1x16mm FIBEROCK	1x16mm FIBEROCK	Nil		48	49	44	45
			50G11, 50P14	One Side	57	59	58	60
			R1.5, 70P14	One Side	58	60	59	61
			R2.0, 90P14	One Side	-	60	-	61
			50G11, 50P14	Both Sides	59	61	60	62
			R1.5, 70P14	Both Sides	60	62	61	63
			R2.0, 90P14	Both Sides	-	63	-	64

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

TTF90.1

FIRE RESISTANCE RATING
NLB **–/90/90**
FROM BOTH SIDES

FRR Basis: FAR4405

Side 1: 2x13mm Fiberock
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x13mm Fiberock

ACOUSTIC RATINGS SLR-FB-T-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		212	252	212	252
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_w		STC	
TTF90.1A	2x13mm FIBEROCK	2x13mm FIBEROCK	Nil		56	57	55	55
			50G11, 50P14	One Side	65	67	66	68
			R1.5, 70P14	One Side	66	68	67	69
			R2.0, 90P14	One Side	-	68	-	69
			50G11, 50P14	Both Sides	67	69	68	70
			R1.5, 70P14	Both Sides	68	70	69	71
			R2.0, 90P14	Both Sides	-	71	-	72

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

FIBEROCK – TWIN STUD

TTF120.1

FIRE RESISTANCE RATING
NLB **–/120/120**
FROM BOTH SIDES

FRR Basis: FAR2396

Side 1: 2x16mm Fiberock
Framing: Twin timber studs
Gap: 20mm
Insulation: Refer to table
Side 2: 2x16mm Fiberock

ACOUSTIC RATINGS RT&A SLR-FB-T-DS-01

SYSTEM	LINING SIDE 1	LINING SIDE 2	MIN WALL WIDTH mm		224	264	224	264
			STUD SIZE mm		70	90	70	90
			INSULATION*		R_W		STC	
TTF120.1A	2x16mm FIBEROCK	2x16mm FIBEROCK	Nil		58	60	57	57
			50G11, 50P14	One Side	67	69	68	70
			R1.5, 70P14	One Side	68	70	69	71
			R2.0, 90P14	One Side	-	70	-	71
			50G11, 50P14	Both Sides	69	71	70	72
			R1.5, 70P14	Both Sides	70	72	71	73
			R2.0, 90P14	Both Sides	-	73	-	74

* **50G11** – 50mm 11kg/m³ glasswool insulation **R1.5** – R1.5 65mm insulation **R2.0** – R2.0 90mm insulation
50P14 – 50mm polyester insulation 14kg/m³ **70P14** – 70mm polyester insulation 14kg/m³ **90P14** – 90mm polyester insulation 14kg/m³

NOTES

EXTERNAL WALLS

Fibre Cement Walls

SYSTEMS + INNOVATIVE SYSTEMS SOLUTIONS

» INTRODUCTION

DESIGN CONSIDERATIONS

- Refer to the NZBC fire resistance requirements for external walls.
- Refer to NZS 3604:2011 for load-bearing capacities of fire-rated timber-framed walls.
- Beware of flanking sound effects on acoustic performance.
- Water resistant linings must be used in wet areas.
- Fire resistant plasterboard must be used on the outer side of timber framing where required.
- Refer to USG Boral Plasterboard Installation Manual for notes on Condensation and Ventilation.
- External wall systems must satisfy NZBC thermal resistance requirements. Cavity insulation must be selected accordingly. The minimum insulation requirement is detailed in system installation tables.
- External cladding must be installed on battens.

INSTALLATION

GENERAL

- Fire-rated and acoustic systems must be installed strictly in accordance with USG Boral specifications in order to achieve stated FRRs and acoustic ratings.
- Refer to the Timber Stud Walls and Junctions and Penetrations sections for installation specifications for fire-rated timber-framed walls.
- Timber framing must comply with NZS 3604:2011 *Timber-framed buildings.*

JOINTING AND FINISHING

- Stop and finish face layers of internal linings with the appropriate USG Boral jointing system (refer to the USG Boral Plasterboard Installation Manual). Joints and junctions in inner layers of multiple-layer systems do not need to be stopped.
- SHEETROCK® paper tape must be used in fire-rated, bracing and wet area systems.

CAULKING

Perimeter gaps and penetrations in fire-rated and acoustic systems must be caulked with an approved sealant (refer to the Junctions and Penetrations section).

EXTERNAL WALLS

DESCRIPTION

USG Boral wall systems utilise fire-rated or internal linings direct-fixed to timber framing.

DESIGN OPTIONS

USG Boral external wall systems are available with fire-rated configurations up to FRR 60/60/60 from one or both sides.

MATERIALS

PLASTERBOARD LININGS

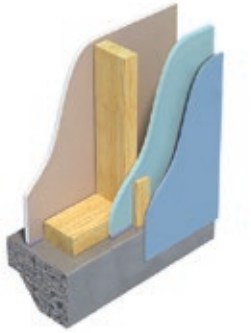
- 10mm/13mm Multistop 4 plasterboard
- 13mm Firestop plasterboard

FIBRE CEMENT EXTERIOR WALLS

UB-EX30

FIRE RESISTANCE RATING
LB **30/30/30**
FROM BOTH SIDES

FRR Basis: FAR 4786



Internal Lining:
1 x 10mm Multistop pbd
Framing: 90x45mm timber studs
Insulation: Refer to table
Cavity Batten:
Refer to table
External Cladding:
Refer to table

USG BORAL EXTERIOR FIRE-RATED WALL SYSTEMS

SYSTEM	INTERNAL PLASTERBOARD LINING	JAMES HARDIE EXTERNAL CLADDING	CAVITY* BATTEN	EXTERIOR WRAP	INSULATION
UB-EX30JH.A	1x10mm MULTISTOP	16.0mm Linea Weatherboard* 16.0mm Linea Oblique Weatherboard* 14.0mm Stria Cladding* 9.0mm Axon Panel 9.0mm Monotek Sheet* 9.0mm Titan Façade Panel* 7.5mm Hardieflex Sheet 6.0mm Hardieflex Sheet	NIL	Building wrap	R2.2 Fibreglass
UB-EX30JH.B			YES	James Hardie RAB Board	
UB-EX30JH.C			YES	Building wrap	

* Linea, Stria, Monoteck and Titan claddings **must** be on cavity battens

INSTALLATION

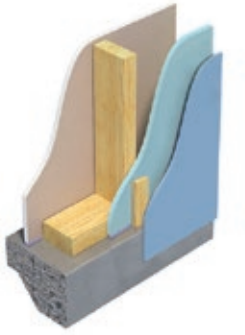
USG Boral Plasterboard	One layer of 10mm Multistop on the internal face, and one layer of James Hardie exterior cladding on the external face. Use full-length sheets where possible. Fix sheets at 300mm centres to perimeter of sheets and to the intermediate studs. Fixings should start 50mm from top or bottom of wall. Horizontal and vertical fixing permitted. Nogs are at 800mm centres for vertical lining and 1200mm centres for horizontal lining. All sheet edges must be made over solid framing.
Plasterboard Fasteners	41mm x 6g bugle head drywall screws, 12mm from sheet edges minimum.
Fixing Exterior Cladding	Consult James Hardie installation instructions for the fixing of the exterior cladding systems.
Timber Framing	Timber framing is constructed using framing dimensions and height as determined by NZS 3604:2011 stud tables. Minimum stud size to be 90 x 45mm for LB walls, at 600mm centres maximum.
Fixing Building Wrap	Consult with manufacturer's installation instructions for installing building wrap products.
Insulation (minimum)	Wall cavities are filled with 90mm R2.2 fibreglass insulation infill.
Jointing of the Plasterboard	All fastener heads stopped and all sheet joints reinforced with paper jointing tape and stopped in accordance with AS/NZS 2589.

FIBRE CEMENT EXTERIOR WALLS

UB-EX60

FIRE RESISTANCE RATING
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FAR 4786



Internal Lining:
1 x 13mm Firestop or Multistop pbd
Framing: 90x45mm timber studs
Insulation: Refer to table
Cavity Batten:
Refer to table
External Cladding:
Refer to table

USG BORAL EXTERIOR FIRE-RATED WALL SYSTEMS

SYSTEM	INTERNAL PLASTERBOARD LINING	JAMES HARDIE EXTERNAL CLADDING	CAVITY* BATTEN	EXTERIOR WRAP	INSULATION
UB-EX60JH.A	1x13mm FIRESTOP or 1x13mm MULTISTOP	16.0mm Linea Weatherboard* 16.0mm Linea Oblique Weatherboard* 14.0mm Stria Cladding* 9.0mm Axon Panel 9.0mm Monotek Sheet* 9.0mm Titan Façade Panel* 7.5mm Hardieflex Sheet 6.0mm Hardieflex Sheet	NIL	Building wrap	90mm mineral wool
UB-EX60JH.B			YES	James Hardie RAB Board	
UB-EX60JH.C			YES	Building wrap	

* Linea, Stria, Monoteck and Titan claddings **must** be on cavity battens

INSTALLATION

USG Boral Plasterboard	One layer of 13mm Firestop or 13mm Multistop on the internal face, and one layer of James Hardie exterior cladding on the external face. Use full-length sheets where possible. Fix sheets at 300mm centres to perimeter of sheets and to intermediate studs. Fixings should start 50mm from top or bottom of wall. Horizontal and vertical fixing permitted. Nogs are at 800mm centres for vertical lining and 1200mm centres for horizontal lining. All sheet edges must be made over solid framing.
Plasterboard Fasteners	51mm x 7g bugle head drywall screws, 12mm from sheet edges minimum.
Fixing Exterior Cladding	Consult James Hardie installation instructions for the fixing of the exterior cladding systems.
Timber Framing	Timber framing is constructed using framing dimensions and height as determined by NZS 3604:2011 stud tables. Minimum stud size to be 90 x 45mm for LB walls, at 600mm centres maximum.
Fixing Building Wrap	Consult with manufacturer's installation instructions for installing building wrap products.
Insulation (minimum)	Wall cavities are filled with James Hardie 90mm mineral wool insulation infill.
Jointing of the Plasterboard	All fastener heads stopped and all sheet joints reinforced with paper jointing tape and stopped in accordance with AS/NZS 2589.

SYSTEM TEST & ASSESSMENT REPORT REFERENCES

REPORT REFERENCE	DESCRIPTION
FSV 0224	10mm Multistop each side of a single timber frame
EWFA 27211-03	1 x 13mm Multistop or Firestop on each side of a 51mm steel stud 1 x 16mm Multistop or Firestop on each side of a 51mm steel stud
WFRA 46008	Assessment review
EWFA 29812300A	Assessment review
WFRA F91798	Fire resistance test 1 x 13mm Firestop on each side of a 64mm steel stud

MASONRY UPGRADES

SYSTEMS + INNOVATIVE SYSTEMS SOLUTIONS

INTRODUCTION

DESCRIPTION

USG Boral Masonry Upgrades encompass a range of Acoustic and Fire Upgrade systems with plasterboard linings on one or both sides of masonry walls.

DESIGN OPTIONS

MASONRY ACOUSTIC UPGRADES

Masonry Acoustic Upgrade systems outlined in this manual achieve acoustic ratings up to STC = 79, R_w = 79.

The following types of Acoustic Upgrade systems have been included.

TABLE 12: **TYPES OF ACOUSTIC UPGRADES**

SYSTEM TYPE	WALL TYPE
MWI	Internal masonry walls
MWB	Enclosed blade columns
MWS	Lift and stair shaft walls

Internal Walls

Acoustic ratings have been provided for the following types of internal masonry walls:

- 150mm concrete panel
- 200mm concrete panel
- 140mm concrete block (core filled 295kg/m^2)
- 190mm concrete block (core filled 400kg/m^2).

Refer to USG Boral for acoustic upgrades of other types of masonry walls.

Acoustic upgrades of internal masonry walls utilise 13mm non-fire resistant plasterboard fixed to one or both sides of the wall via:

- direct adhesive fixings
- 28mm Rondo furring channels
- free-standing 64mm Rondo studs.

Blade Columns

Acoustic upgrades of enclosed blade columns are provided for 150mm and 200mm concrete thicknesses.

Lining configurations are based on various fire-rated steel stud wall systems, with the following fixing options:

- 28mm Rondo furring channels on both sides
- 28mm Rondo furring channel on one side and free-standing 64mm studs on the other side.

Shaft/Stair Walls

Acoustic upgrades of shaft and stair walls are based on the same masonry and lining types as upgrades of internal walls, with linings fixed to one side of the wall only, via 28mm Rondo furring channels or free-standing 64mm Rondo steel studs.

MASONRY FIRE UPGRADES

Masonry Fire Upgrade systems outlined in this manual provide additional fire resistance capacity up to +90/+90/+90 from one side only or +90/+180/+180 from both sides.

Fire upgrade systems utilise single or multiple layers of fire resistant plasterboard fixed to one or both sides of masonry walls on Rondo 28mm furring channels.

» INTRODUCTION

MATERIALS

MASONRY ACOUSTIC UPGRADES

Plasterboard Linings

- 13mm SHEETROCK plasterboard
- 10mm/13mm/16mm Multistop plasterboard[1]
- 13mm/16mm Firestop plasterboard (blade columns)
- 13mm Soundstop plasterboard

Metal Components

- Rondo 129 furring channel and direct-fixing clips
- Rondo 64mm C-studs and tracks

Insulation

- 25mm partition 24kg/m^3 glasswool
- 50mm partition 11kg/m^3 glasswool
- 75mm partition 11kg/m^3 glasswool
- 30mm polyester insulation 14kg/m^3
- 75mm polyester insulation 14kg/m^3

Screws

Refer to General Information – Fasteners (Tables 2-4) for plasterboard screw types suitable for fixing to metal sections.

Masonry Adhesive

USG Boral Masonry Adhesive is a plaster-based setting compound that has been specifically designed for direct fixing of plasterboard linings to masonry walls.

Caulking

H.B. Fuller Firesound sealant

MASONRY FIRE UPGRADES

Plasterboard Linings

- 13mm/16mm Firestop plasterboard
- 13mm/16mm Multistop plasterboard[1]

Metal Components

- Rondo 129 furring channel and direct-fixing clips

Screws

Refer to General Information – Fasteners (Tables 2-4) for plasterboard screw types suitable for fixing to metal sections.

Caulking

H.B. Fuller Firesound sealant

DESIGN CONSIDERATIONS

- Refer to the Multi-Residential section for NZBC acoustic and fire resistance requirements for multi-residential buildings.
- Systems with free-standing steel studs satisfy the NZBC requirements for impact sound insulation as well as allowing a cavity space for services to run between the masonry wall and plasterboard.
- Beware of flanking sound effects on acoustic performance.
- Refer to the masonry manufacturer for the FRRs of masonry walls.

[1] Multistop™ 4 may be substituted for Firestop where a Wet Area plasterboard may also be required

» INTRODUCTION

INSTALLATION

GENERAL

- Fire-rated and acoustic upgrade systems must be assembled strictly in accordance with the installation details and specifications outlined in this manual to achieve the stated FRRs and acoustic ratings.
- Blockwork masonry walls must be constructed in accordance with NZS 4229 *Masonry structures.*
- Concrete walls must be constructed in accordance with NZS 3101 *Concrete structures*.

MASONRY ADHESIVE METHOD

NOTE:

The masonry adhesive method must not be used for the installation of fire resistant linings in fire upgrade systems.

- It is essential that all new masonry surfaces are allowed to dry to normal levels before installing USG Boral plasterboards.
- Masonry walls in wet areas, such as bathrooms and laundries, may be lined with Multistop 4 or Fiberock as per the wet area installation requirements (refer to the USG Boral Plasterboard Installation Manual or Wet Area Systems Manual). Linings in tiled areas must be mechanically fastened.
- Masonry walls should be checked for flatness and level, using a straight edge or string line, before determining the fixing method.
- Wall surfaces with high/low spots over 15mm or out of plumb by more than 15mm will need to be straightened with a series of levelling pads.
- The masonry adhesive method should not be used for walls over 3m high or where the wall surface requires more than 25mm of packing to bring it back to a true line.
- All services should be in place prior to plasterboard installation.
- Masonry walls must be dry and free from dust, oil, flaking paint, efflorescence, release agents, or any other material or treatment that could adversely affect bonding of masonry adhesive.
- Adhesion can also be affected by the porosity and/or previous surface treatment of a wall. Surfaces that are particularly dry or porous may need to be dampened. For best results, masonry walls should be coated with a bonding agent before applying masonry adhesive.
- Masonry adhesive daubs should be about 50mm diameter by 15mm thickness. Space adhesive daubs at maximum 450mm centres vertically and horizontally, and 50mm nominally from sheet ends and edges.
- Ribbons or additional daubs of masonry adhesive must be applied at sheet ends and at cornice and skirting lines. Additional daubs of masonry adhesive are also required at external angles and fixtures.

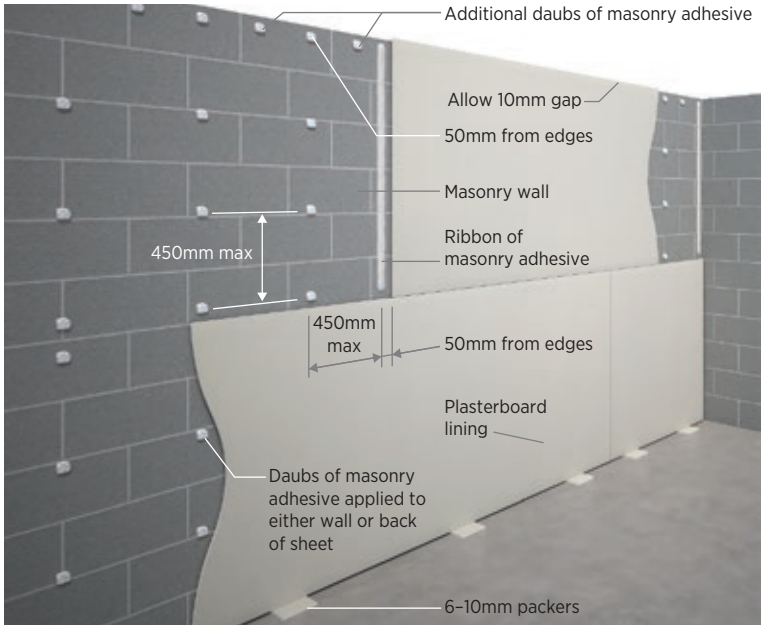


Figure 18: **Fixing to a True Wall Surface**

For detailed masonry adhesive installation instructions, refer to the USG Boral Plasterboard Installation Manual.

» INTRODUCTION

INSTALLATION USING FURRING CHANNELS

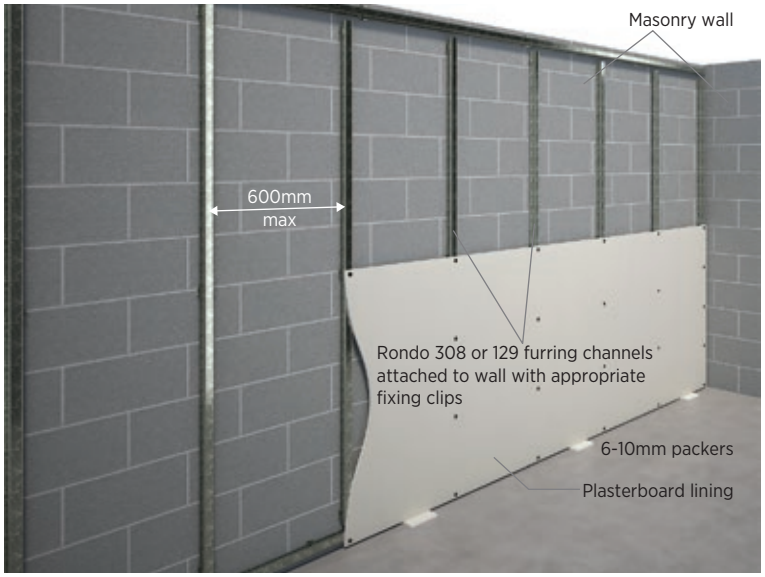


Figure 19: **Fixing to Furring Channels Clipped to Wall**

- Set out fixing clips for vertical channels spaced at maximum 600mm centres and for top and bottom horizontal channels. Pack clips where required to achieve a true surface.
- Fix clips to masonry with suitable fasteners.
- Fix plasterboard to furring channels using an appropriate method.
- Refer to the Steel Stud Wall section for plasterboard installation instructions for fire-rated and non-fire-rated systems.

NOTES:

- Fire resistant linings in fire upgrade systems must be mechanically fixed. Adhesive fixing is not permitted.
- In fire upgrade systems, clips must be fixed to masonry with only metal fasteners. Plastic sleeves are not permitted.

INSTALLATION ON STEEL STUDS

Refer to the Steel Stud Walls and Junctions and Penetrations sections for installation instructions for fire-rated and non-fire-rated systems.

JOINTING AND FINISHING

- Finish all joints and internal and external corners in face layers with the appropriate USG Boral jointing system (refer to the USG Boral Plasterboard Installation Manual). Joints and junctions in inner layers of multiple layer systems do not need to be stopped.
- SHEETROCK® paper tape must be used in fire-rated, bracing and wet area systems.

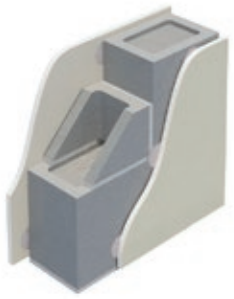
CAULKING

Perimeter gaps and penetrations in fire-rated and acoustic systems must be caulked with approved sealant H.B. Fuller Firesound sealant.

ACOUSTIC UPGRADES – INTERNAL WALLS

MWI.1

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- 1x13mm non-fire resistant pbd, adhesive fixed

Masonry:
- Refer to table

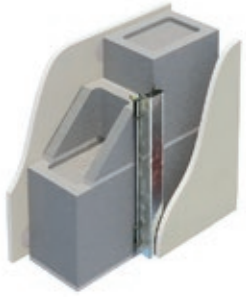
Side 2:
- 1x13mm non-fire resistant pbd, adhesive fixed

ACOUSTIC RATINGS BASIS: RT&A TE405-05F13

SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION	R_W	STC
					SIDE 1	SIDE 2			
MWI.1A	1x13mm SHEETROCK	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	180	–	–	Nil	50	48
			200mm concrete panel (480kg/m²)	230	–	–	Nil	52	50
			140mm concrete block (core filled 295kg/m²)	170	–	–	Nil	48	46
			190mm concrete block (core filled 400kg/m²)	220	–	–	Nil	50	48

MWI.2

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- 1x13mm non-fire resistant pbd, adhesive fixed

Masonry:
- Refer to table

Side 2:
- 1x13mm non-fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to masonry wall with direct fix clips
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-05F13

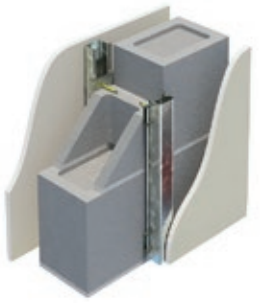
SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_W	STC
					SIDE 1	SIDE 2			
MWI.2A	1x13mm SHEETROCK	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	208	–	30	Nil	54	53
							25G24, 30P14 (furring cavity)	58	57
			200mm concrete panel (480kg/m²)	258	–	30	Nil	57	56
							25G24, 30P14 (furring cavity)	61	60
			140mm concrete block (core filled 295kg/m²)	198	–	30	Nil	51	50
							25G24, 30P14 (furring cavity)	54	53
			190mm concrete block (core filled 400kg/m²)	248	–	30	Nil	54	53
							25G24, 30P14 (furring cavity)	57	56
MWI.2C	1x13mm SOUNDSTOP	1x13mm SOUNDSTOP	140mm concrete block (core filled 295kg/m²)	198	–	30	Nil	54	53
							25G24, 30P14 (furring cavity)	57	56
				218	–	50	50G11, 50P14 (furring cavity)	59	58

* **25G24** – 25mm partition 24kg/m³ glasswool **30/50P14** – 30/50mm polyester insulation 14kg/m³ density
50G11 – 50mm partition 11kg/m³ glasswool

ACOUSTIC UPGRADES – INTERNAL WALLS

MWI.3

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- 1x13mm non-fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to masonry wall with direct fix clips
- Insulation (refer to table)

Masonry:
- Refer to table

Side 2:
- 1x13mm non-fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to masonry wall with direct fix clips
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-05F13

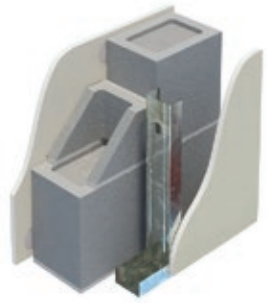
SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_w	STC
					SIDE 1	SIDE 2			
MWI.3A	1x13mm SHEETROCK	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	236	30	30	Nil	52	50
							25G24, 30P14 (both cavities)	58	56
			200mm concrete panel (480kg/m²)	286	30	30	Nil	55	53
							25G24, 30P14 (both cavities)	61	59
			140mm concrete block (core filled 295kg/m²)	226	30	30	Nil	50	48
							25G24, 30P14 (both cavities)	56	54
			190mm concrete block (core filled 400kg/m²)	276	30	30	Nil	53	51
							25G24, 30P14 (both cavities)	59	57
MWI.3C	1x13mm SOUNDSTOP	1x13mm SOUNDSTOP	140mm concrete block (core filled 295kg/m²)	266	50	50	Nil	53	51
							50G11, 50P14 (both cavities)	59	57
MWI.3H[1]			190mm concrete block (core filled 400kg/m²)	276	30	30	Nil	54	52
							25G24, 30P14 (both cavities)	60	58

* **25G24** – 25mm partition 24kg/m³ glasswool **30/50P14** – 30/50mm polyester insulation 14kg/m³ density
50G11 – 50mm partition 11kg/m³ glasswool

[1] 2 x 13mm each side system also available for higher upgrade

MWI.4

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- 1x13mm non-fire resistant pbd, adhesive fixed

Masonry:
- Refer to table

Side 2:
- 1x13mm non-fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between steel frame and masonry
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-05F13

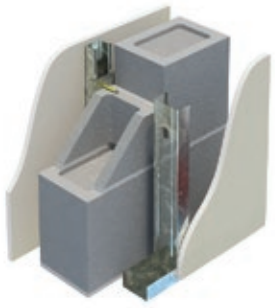
SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_w	STC
					SIDE 1	SIDE 2			
MWI.4A	1x13mm SHEETROCK	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	260	–	84	Nil	61	61
							75G11, 75P14 (stud cavity)	67	67
			200mm concrete panel (480kg/m²)	310	–	84	Nil	64	64
							75G11, 75P14 (stud cavity)	70	70
			140mm concrete block (core filled 295kg/m²)	250	–	84	Nil	59	59
							75G11, 75P14 (stud cavity)	63	63
			190mm concrete block (core filled 400kg/m²)	300	–	84	Nil	62	62
							75G11, 75P14 (stud cavity)	66	66
MWI.4C	1x13mm SOUNDSTOP	1x13mm SOUNDSTOP	150mm concrete panel (360kg/m²)	260	–	84	Nil	63	63
							75G11, 75P14 (stud cavity)	69	69
			140mm concrete block (core filled 295kg/m²)	250	–	84	Nil	61	61
							75G11, 75P14 (stud cavity)	65	65

* **75G11** – 75mm partition 11kg/m³ glasswool **75P14** – 75mm polyester insulation 14kg/m³ density

ACOUSTIC UPGRADES – INTERNAL WALLS

MWI.5

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- 1x13mm non-fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to masonry wall with direct fix clips
- Insulation (refer to table)

Masonry:
- Refer to table

Side 2:
- 1x13mm non-fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between steel frame and masonry
- Insulation (refer to table)

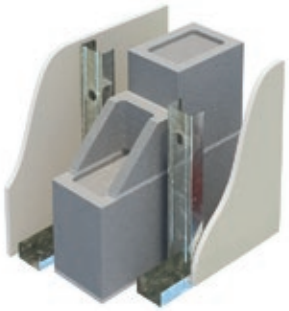
ACOUSTIC RATINGS BASIS: RT&A TE405-05F13

SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_W	STC
					SIDE 1	SIDE 2			
MWI.5A	1x13mm SHEETROCK	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	290	30	84	Nil	60	60
							75G11, 75P14 (stud cavity only)	66	66
			200mm concrete panel (480kg/m²)	340	30	84	Nil	63	63
							75G11, 75P14 (stud cavity only)	69	69
			140mm concrete block (core filled 295kg/m²)	280	30	84	Nil	56	56
							75G11, 75P14 (stud cavity only)	60	60
			190mm concrete block (core filled 400kg/m²)	330	30	84	Nil	59	59
							75G11, 75P14 (stud cavity only)	63	63

* **75G11** – 75mm partition 11kg/m³ glasswool **75P14** – 75mm polyester insulation 14kg/m³ density

MWI.6

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- 1x13mm non-fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between steel frame and masonry
- Insulation (refer to table)

Masonry:
- Refer to table

Side 2:
- 1x13mm non-fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between steel frame and masonry
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-05F13

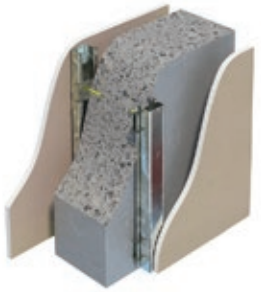
SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_W	STC
					SIDE 1	SIDE 2			
MWI.6A	1x13mm SHEETROCK	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	344	84	84	Nil	63	63
							75G11, 75P14 (both cavities)	69	69
			200mm concrete panel (480kg/m²)	394	84	84	Nil	66	66
							75G11, 75P14 (both cavities)	72	72
			140mm concrete block (core filled 295kg/m²)	334	84	84	Nil	59	59
							75G11, 75P14 (both cavities)	64	64
			190mm concrete block (core filled 400kg/m²)	384	84	84	Nil	62	62
							75G11, 75P14 (both cavities)	67	67

* **75G11** – 75mm partition 11kg/m³ glasswool **75P14** – 75mm polyester insulation 14kg/m³ density

ACOUSTIC UPGRADES – BLADE COLUMNS

MWB.1

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- One or more layers of fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to concrete wall with direct fix clips
- Insulation (refer to table)

Masonry:
- Refer to table

Side 2:
- One or more layers of fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to concrete wall with direct fix clips
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S09

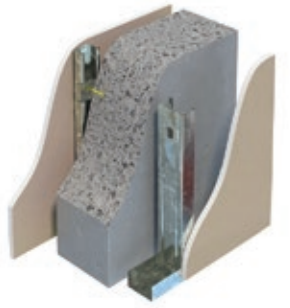
SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_W	STC
					SIDE 1	SIDE 2			
MWB.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	150mm concrete panel (360kg/m²)	236	30	30	Nil	51	51
							25G24, 30P14 (both cavities)	62	62
			200mm concrete panel (480kg/m²)	286	30	30	Nil	53	53
							25G24, 30P14 (both cavities)	64	64
MWB.1B	1x13mm FIRESTOP	2x13mm FIRESTOP	150mm concrete panel (360kg/m²)	249	30	30	Nil	54	54
							25G24, 30P14 (both cavities)	65	65
			200mm concrete panel (480kg/m²)	299	30	30	Nil	56	56
							25G24, 30P14 (both cavities)	67	67
MWB.1C	2x13mm FIRESTOP	2x13mm FIRESTOP	150mm concrete panel (360kg/m²)	262	30	30	Nil	57	57
							25G24, 30P14 (both cavities)	68	68
			200mm concrete panel (480kg/m²)	312	30	30	Nil	59	59
							25G24, 30P14 (both cavities)	70	70
MWB.1D	1x16mm FIRESTOP	1x16mm FIRESTOP	150mm concrete panel (360kg/m²)	242	30	30	Nil	53	53
							25G24, 30P14 (both cavities)	64	64
			200mm concrete panel (480kg/m²)	292	30	30	Nil	55	55
							25G24, 30P14 (both cavities)	66	66
MWB.1E	2x16mm FIRESTOP	2x16mm FIRESTOP	150mm concrete panel (360kg/m²)	274	30	30	Nil	59	59
							25G24, 30P14 (both cavities)	70	70
			200mm concrete panel (480kg/m²)	324	30	30	Nil	61	61
							25G24, 30P14 (both cavities)	72	72

* **25G24** – 25mm partition 24kg/m³ glasswool **30P14** – 30mm polyester insulation 14kg/m³ density

ACOUSTIC UPGRADES – BLADE COLUMNS

MWB.2

FIRE RESISTANCE RATING
(refer masonry manufacturer)



Side 1:
- One or more layers of fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to concrete wall with direct fix clips
- Insulation (refer to table)

Masonry:
- Refer to table

Side 2:
- One or more layers of fire resistant pbd
- 64mm steel studs @ 600mm ctrs
- 20mm gap between steel frame and concrete wall
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S09

SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_W	STC
					SIDE 1	SIDE 2			
MWB.2A	1x13mm FIRESTOP	1x13mm FIRESTOP	150mm concrete panel (360kg/m²)	290	30	84	Nil	60	60
							75G11, 75P14 (stud cavity only)	68	68
			200mm concrete panel (480kg/m²)	340	30	84	Nil	62	62
							75G11, 75P14 (stud cavity only)	71	71
MWB.2B	1x13mm FIRESTOP	2x13mm FIRESTOP	150mm concrete panel (360kg/m²)	303	30	84	Nil	63	63
							75G11, 75P14 (stud cavity only)	71	71
			200mm concrete panel (480kg/m²)	353	30	84	Nil	66	66
							75G11, 75P14 (stud cavity only)	74	74
MWB.2C	2x13mm FIRESTOP	2x13mm FIRESTOP	150mm concrete panel (360kg/m²)	316	30	84	Nil	66	66
							75G11, 75P14 (stud cavity only)	74	74
			200mm concrete panel (480kg/m²)	366	30	84	Nil	69	69
							75G11, 75P14 (stud cavity only)	77	77
MWB.2D	1x16mm FIRESTOP	1x16mm FIRESTOP	150mm concrete panel (360kg/m²)	296	30	84	Nil	62	62
							75G11, 75P14 (stud cavity only)	70	70
			200mm concrete panel (480kg/m²)	346	30	84	Nil	64	64
							75G11, 75P14 (stud cavity only)	72	72
MWB.2E	2x16mm FIRESTOP	2x16mm FIRESTOP	150mm concrete panel (360kg/m²)	328	30	84	Nil	68	68
							75G11, 75P14 (stud cavity only)	76	76
			200mm concrete panel (480kg/m²)	378	30	84	Nil	71	71
							75G11, 75P14 (stud cavity only)	79	79

* **75G11** – 75mm partition 11kg/m³ glasswool **75P14** – 75mm polyester insulation 14kg/m³ density

ACOUSTIC UPGRADES – SHAFT/STAIR WALLS

MWS.1

FIRE RESISTANCE RATING
(refer masonry manufacturer)

Side 1:
- Nil linings

Masonry:
- Refer to table

Side 2:
- 1x13mm non-fire resistant pbd
- 28mm furring channels @ 600mm ctrs fixed to masonry wall with direct fix clips
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S09

SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_w	STC
					SIDE 1	SIDE 2			
MWS.1A	Nil	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	193	–	30	Nil	53	52
							25G24, 30P14 (furring cavity)	57	56
			200mm concrete panel (480kg/m²)	243	–	30	Nil	56	55
							25G24, 30P14 (furring cavity)	60	59
			140mm concrete block (core filled 295kg/m²)	183	–	30	Nil	51	50
							25G24, 30P14 (furring cavity)	54	53
			190mm concrete block (core filled 400kg/m²)	233	–	30	Nil	54	53
							25G24, 30P14 (furring cavity)	57	56
MWS.1C	Nil	1x13m SOUNDSTOP	140mm concrete block (core filled 295kg/m²)	203	–	50	Nil	52	52
							25G24, 30P14 (furring cavity)	55	55

* **25G24** – 25mm partition 24kg/m³ glasswool **30P14** – 30mm polyester insulation 14kg/m³ density

MWS.2

FIRE RESISTANCE RATING
(refer masonry manufacturer)

Side 1:
- Nil linings

Masonry:
- Refer to table

Side 2:
- 1x13mm non-fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between steel frame and masonry
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S09

SYSTEM	LINING SIDE 1	LINING SIDE 2	MASONRY TYPE	NOM WALL WIDTH mm	CAVITY mm		INSULATION*	R_w	STC
					SIDE 1	SIDE 2			
MWS.2A	Nil	1x13mm SHEETROCK	150mm concrete panel (360kg/m²)	247	–	84	Nil	58	58
							75G11, 75P14 (stud cavity)	64	64
			200mm concrete panel (480kg/m²)	297	–	84	Nil	61	61
							75G11, 75P14 (stud cavity)	67	67
			140mm concrete block (core filled 295kg/m²)	237	–	84	Nil	56	56
							75G11, 75P14 (stud cavity)	60	60
			190mm concrete block (core filled 400kg/m²)	287	–	84	Nil	59	59
							75G11, 75P14 (stud cavity)	63	63
MWS.2C	Nil	1x13mm SOUNDSTOP	150mm concrete panel (360kg/m²)	247	–	84	Nil	60	60
							75G11, 75P14 (stud cavity)	66	66
			140mm concrete block (core filled 295kg/m²)	237	–	84	Nil	57	57
							75G11, 75P14 (stud cavity)	61	61

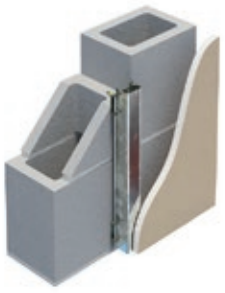
* **75G11** – 75mm partition 11kg/m³ glasswool **75P14** – 75mm polyester insulation 14kg/m³ density

FIRE UPGRADES

MW

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO-0394R



Side 1:
- Refer to table

Masonry:
- Fire-rated or non-fire-rated masonry wall

Side 2:
- Refer to table

MASONRY WALL – FIRE-RATINGS

SYSTEM	ADDITIONAL FRR	LINING SIDE 1	LINING SIDE 2
MW30.1A	+30/+30/+30 from lined side only	1x16mm FIRESTOP on 28mm furring channels @ 600mm ctrs	Nil
MW30.2A	+30/+60/+60 from both sides	1x16mm FIRESTOP on 28mm furring channels @ 600mm ctrs	1x16mm FIRESTOP on 28mm furring channels @ 600mm ctrs
MW60.1A	+60/+60/+60 from lined side only	2x13mm FIRESTOP on 28mm furring channels @ 600mm ctrs	Nil
MW60.2A	+60/+120/+120 from both sides	2x13mm FIRESTOP on 28mm furring channels @ 600mm ctrs	2x13mm FIRESTOP on 28mm furring channels @ 600mm ctrs
MW90.1A	+90/+90/+90 from lined side only	2x16mm FIRESTOP on 28mm furring channels @ 600mm ctrs	Nil
MW90.2A	+90/+180/+180 from both sides	2x16mm FIRESTOP on 28mm furring channels @ 600mm ctrs	2x16mm FIRESTOP on 28mm furring channels @ 600mm ctrs

CEILINGS

INTRODUCTION

CONVENTIONAL CEILINGS

DESCRIPTION

USG Boral conventional ceilings comprise single- or multiple-layer plasterboard linings attached to the underside of the 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/m^2)^ with or without acoustic underlay
- carpet with foam underlay
- ceramic floor tiles on nom 6mm cement sheet (total mass min 15kg/m^2).

Non-fire-rated ceiling systems are available with acoustic ratings up to STC = 52 or R_w = 52.

FIRE-RATED CEILINGS

Fire-rated ceiling systems are available with FRRs up to 120/120/120 and acoustic ratings up to STC = 65 or R_w = 65.

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/m^2) 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 minimum 190mm rafters.

NOTE:

^ The Janka Hardness Test measures the resistance of wood to denting and wear. The 8.5kg/m^2 minimum requirement equates to Janka rating of about 7 or more. However, please check the actual timber species with your supplier to ensure acoustic performance is achieved.

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 ceilings can be curved to a minimum radius of 6000mm.
- Ceilings 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 and 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 to USG Boral for the acoustic ratings 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 67kg 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 13. 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 14.
- Spacings of acoustic ceiling mounts must not exceed the values indicated in Table 15.
- Refer to Rondo for maximum spans and spacings of the Xpress Drywall Grid System.

» INTRODUCTION

TABLE 13: **MAXIMUM LOADS AND SPANS FOR INTERNAL NON-FIRE-RATED CEILINGS**

PLASTERBOARD TYPE	SPAN mm	MAXIMUM TOTAL LOAD* FOR GIVEN WIND CLASS kg/m²			
		LOW	MEDIUM	HIGH	VERY HIGH
10mm SHEETROCK or 13mm SHEETROCK	600 (max)	2.6†	2.6†	2.0	2.0
	450 (max)	2.6†			
10mm MULTISTOP 4	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 14: **MAXIMUM SPANS OF CONTINUOUS RONDO 129 FURRING CHANNELS**

CEILING LINING	WIND CLASS – MEDIUM		WIND CLASS – HIGH	
	@ 450mm	@ 600mm	@ 450mm	@ 600mm
1x10mm (7.2kg/m² max)	2070	1900	1850	1630
1x13mm (9.2kg/m² max)	2060	1850	1810	1600
1x16mm (13kg/m² max)	1890	1760	1750	1540
2x10mm (14.4kg/m² max)	1680	1530	1680	1525
2x13mm (18.4kg/m² max)	1650	1530	1650	1470
2x16mm (26kg/m² max)	1510	1400	1510	1390

Source: Rondo Building Services

TABLE 15: **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 FIRESTOP	1350 (R, B)	600	1200 (R, B)	600
1x16mm FIRESTOP	1350 (R, B)	600	1200 (R, B)	600
2x13mm 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
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/13mm Sheetrock plasterboard
- 13mm/16mm Firestop plasterboard
- 10mm Multistop 4
- 25mm Shaftliner

FURRING CHANNELS AND FIXING CLIPS

Figure 20: **Rondo 129 Furring Channel**

Figure 21: **Rondo 237 Fixing Clip**

Figure 22: **Rondo STWC Sound Isolation Mount**

Figure 23: **Rondo STPC Sound Isolation Clip**

SUSPENDED CEILING SYSTEMS

- Rondo Xpress® Drywall Grid System
- Rondo KEY-LOCK® Concealed Suspended Ceiling
- Rondo ScrewFix® Suspended Ceiling

INSULATION

- R2.5 ceiling
- R3.0 ceiling
- 50mm partition 11kg/m^3 glasswool
- 50mm polyester insulation 7kg/m^3 density
- Reflective foil insulation
- Building blanket

INSTALLATION

DIRECT-FIXED SYSTEMS

Where fixing direct to timber or steel framing, framework spacing must not exceed the plasterboard span values indicated in Table 13 or 600mm for fire resistant plasterboards.

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 1m run in abutting furring channels and top cross rails in fire-rated systems.
- Rondo KEY-LOCK, Xpress Drywall Grid and ScrewFix concealed suspended ceiling systems must be installed in accordance with Rondo 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 FRR.

Where components by others are specified in USG Boral fire-rated penetration details (i.e., dampers, GPOs, 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 (15m 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 the Junctions and Penetrations section for control joint details in fire-rated ceilings.
- Control joints in non-fire-rated ceilings can be formed by fitting #093 Zinc or 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 the edge screw-fixings in adjacent sheets. These sheets must be installed with the recessed edges facing down.
- 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 the laminate sheet ends to the previous layer with appropriate laminating screws at 200mm max centres (refer to the General Information — Fasteners Tables 2-4).

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 a combination of adhesive and mechanical fasteners as outlined in the USG Boral Plasterboard Installation Manual (see Figures 19-21) or mechanical fasteners only.
- Multi-layer non-fire-rated plasterboard ceiling systems must be fixed using the mechanical fasteners only method.
- Inner layers of multi-layer ceilings must be installed with the recessed edges facing down.
- In single-layer systems, butt joints must be between the framing members and back-blocked as described in the 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 the USG Boral Installation Manual.
- Plasterboard joints in the inner layers of multi-layer fire-rated and non-fire-rated systems do not need to be stopped.

NOTE:

Paper jointing tape must be used in bracing systems.

» INTRODUCTION

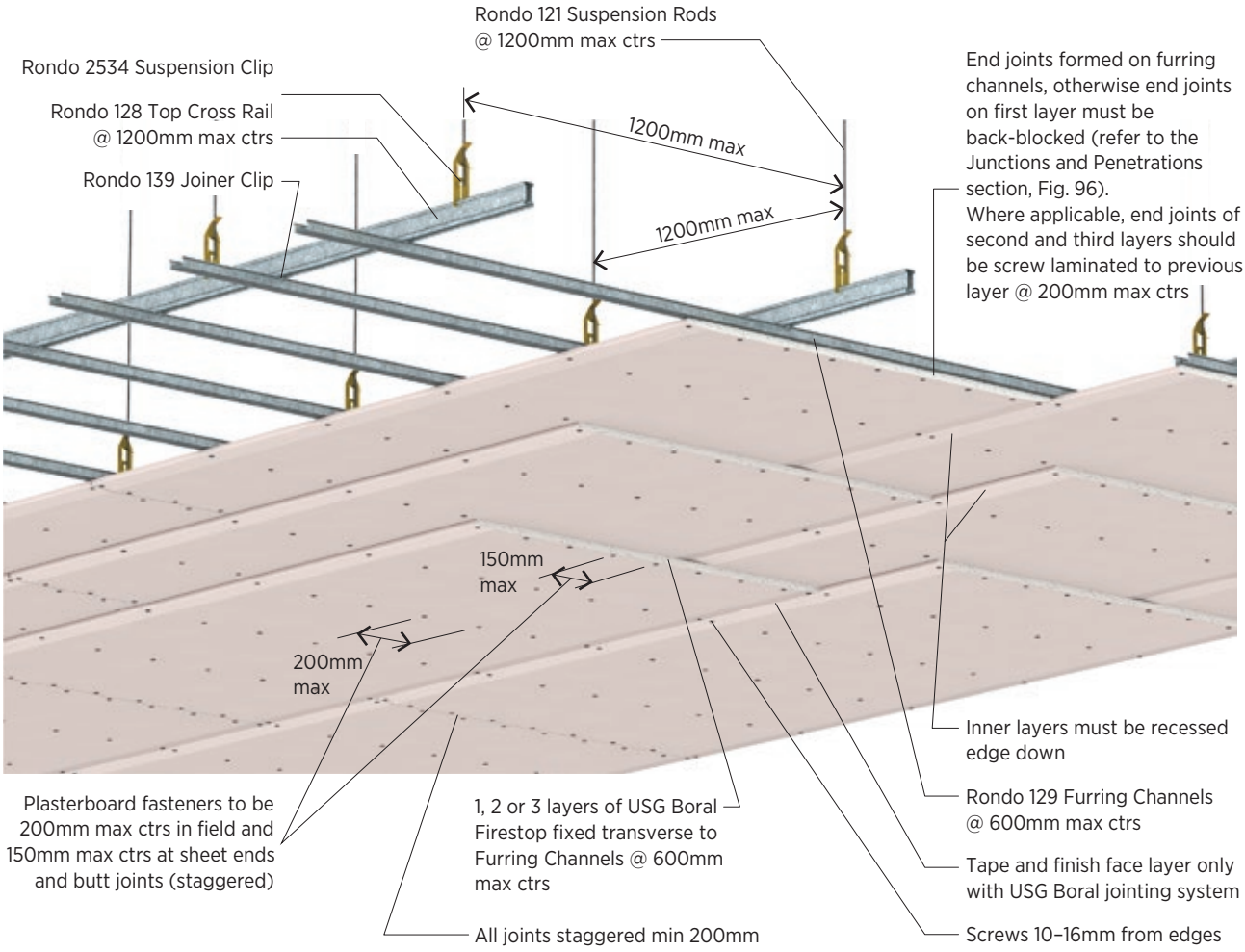


Figure 24: **Fire-rated Ceiling – Screw-fixing Layout**

» INTRODUCTION

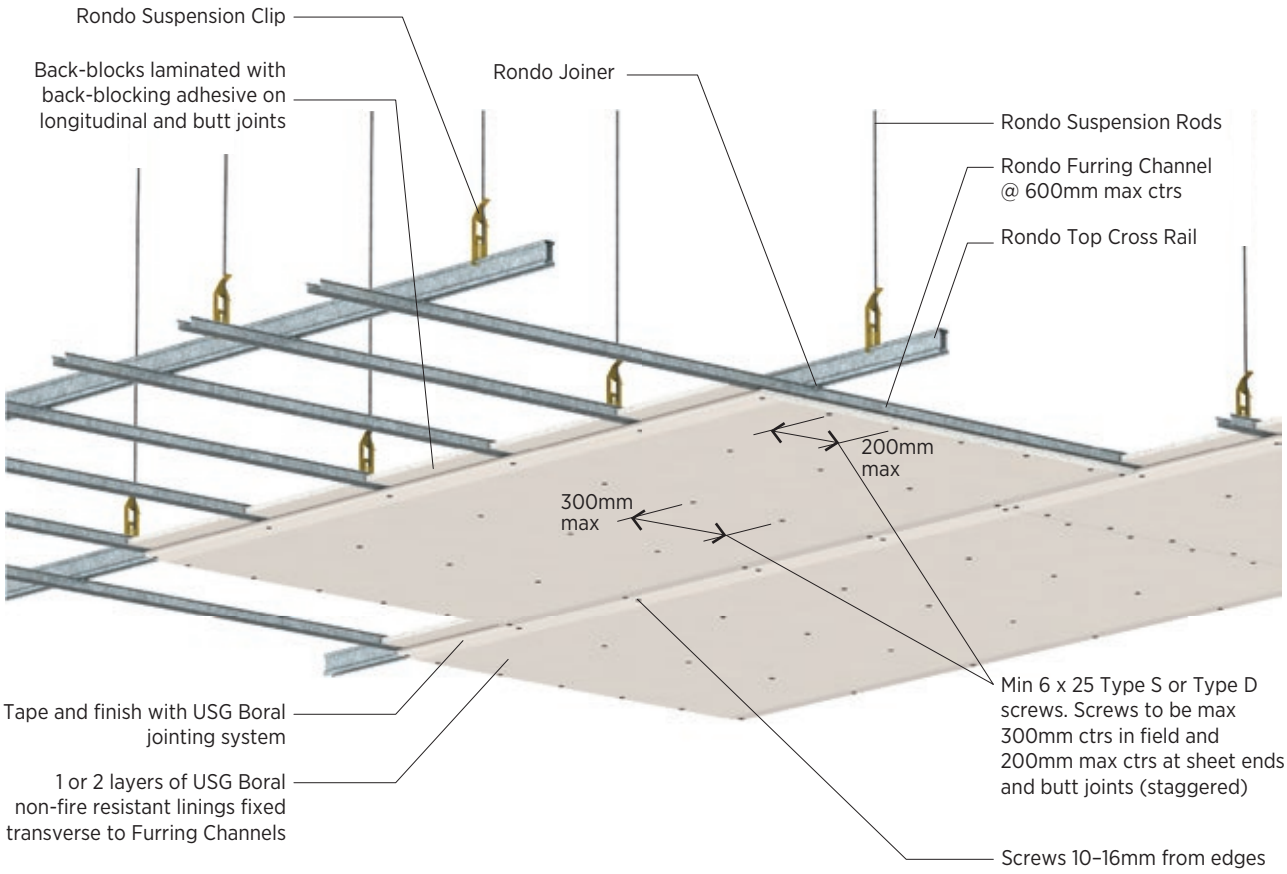


Figure 25: **Non-Fire-rated Ceiling – Screw-fixing Layout**

TABLE 16: **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 sections as joists.

Construction of C-stud ceilings requires access from both above and below.

DESIGN OPTIONS

USG Boral Spanning Ceilings are available in FRRs 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 BMT

INSULATION

- 50mm/90mm partition 11kg/m^3 glasswool
- 50mm/90mm polyester insulation 14kg/m^3 density

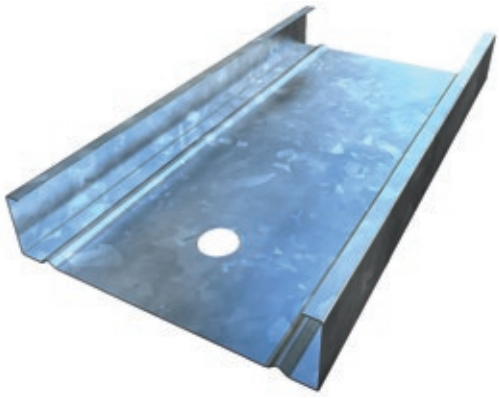


Figure 26: **Rondo 150mm C-stud**

CEILING SPANS

Ceiling spans must not exceed the maximum values shown in the corresponding Maximum Spans, Tables 13-15.

INSTALLATION

- For screw-fixing requirements, refer to the 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 (HB Fuller Firesound™).

JOINTING AND FINISHING

- Stop and finish visible plasterboard joints with USG Boral jointing system as outlined in the USG Boral Installation Manual.
- Plasterboard joints in the inner layers of multi-layer systems do not need to be stopped.
- SHEETROCK® paper tape must be used in fire-rated, bracing and wet area systems.

» 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 $D_{nc,w}$).

Metal panel lay-in, clip-up and custom perforated Pixels™ metal panels are also available for bespoke applications. Contact 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.

See the Acoustic Ceilings tables (pages 114-117) for the range of available mineral fibre tile products.

ECHOSTOP® PLASTERBOARD CEILINGS

Echostop perforated plasterboard ceilings offer the combined benefits of a 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:

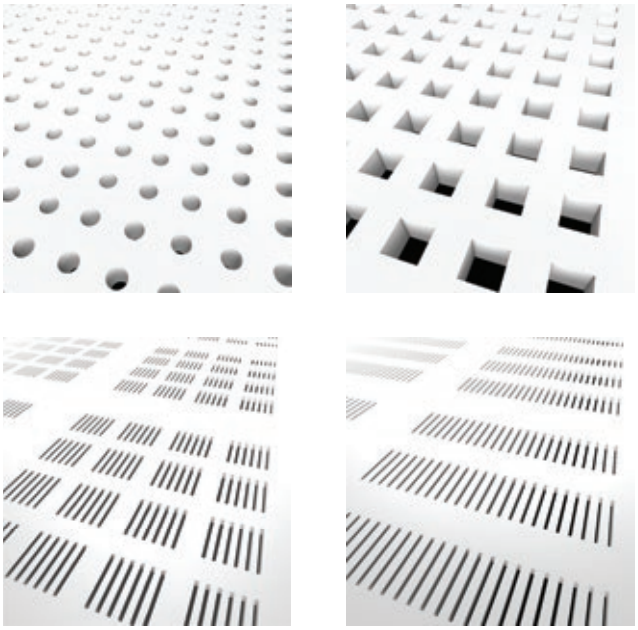


Figure 27: **Echostop Patterns**

Refer to Echostop datasheets for the acoustic performance of the 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.

The Acoustic Ceilings tables included in this manual provide essential information on the performance and features of USG Boral acoustic panels. For additional information, refer to the relevant product data sheets at **www.usgboral.com**

MATERIALS

- USG Boral mineral fibre tile ceilings are composed of mineral fibre tiles laid into DONN® Exposed Grid system.
- Echostop panels can be screw-fixed to Rondo Xpress Drywall Grid, Key-Lock, or ScrewFix concealed ceiling systems.

INSTALLATION

Refer to the USG Boral and Rondo installation specifications for:

- Rondo Xpress Drywall Grid system
- Rondo DONN suspension system
- Rondo KEY-LOCK concealed ceiling system
- Echostop perforated plasterboard.

OVER PARTITION CEILING SYSTEMS

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

The solutions provided in the Over Partition Ceiling Systems Tables (pages 116-117) are based on an extensive laboratory testing 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:

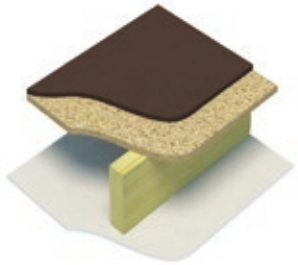
- There is no acoustical benefit when the wall linings extend 100mm above the ceiling, as opposed to a nominal distance of 20mm.
- Penetrations such as standard light troffers on both sides of the dividing wall do not degrade the $D_{nc,w}$ of the ceiling (other types of ceiling penetrations should be assessed by a suitably qualified acoustical engineer).

Figure 28: **Echostop Ceiling**

CEILING UNDER TIMBER FLOOR

CT.1

NON-FIRE-RATED



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

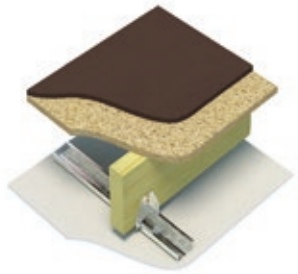
ACOUSTIC RATINGS BASIS: RT&A TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT.1A	1x10mm SHEETROCK	Direct-fixed	Timber flooring (min 8.5kg/m^2)	Nil	42	41	33
				R2.5 GW Ceiling	45	44	34
			Carpet + foam underlay	Nil	41	40	68
				R2.5 GW Ceiling	44	43	69
CT.1B	1x13mm SHEETROCK	Direct-fixed	Timber flooring (min 8.5kg/m^2)	Nil	43	42	34
				R2.5 GW Ceiling	46	45	35
			Carpet + foam underlay	Nil	42	41	68
				R2.5 GW Ceiling	45	44	69

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool

CT.2

NON-FIRE-RATED



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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT.2A	1x10mm SHEETROCK	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m^2)	Nil	46	46	37
				R2.5 GW Ceiling	51	51	39
			Carpet + foam underlay	Nil	46	46	69
				R2.5 GW Ceiling	51	51	71
CT.2B	1x13mm SHEETROCK	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m^2)	Nil	47	47	38
				R2.5 GW Ceiling	52	52	40
			Carpet + foam underlay	Nil	47	47	69
				R2.5 GW Ceiling	52	52	71

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool

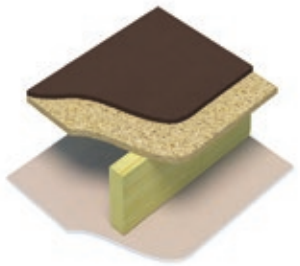
Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.

CEILING UNDER TIMBER FLOOR

CT30.1

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

FRR Basis: FCO-1658



Direct-fixed system shown

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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT30.1A	1x13mm FIRESTOP	Direct-fixed	Timber flooring (min 8.5kg/m^2)	R2.5 GW Ceiling	48	47	37
			Carpet + foam underlay	R2.5 GW Ceiling	47	46	69
CT30.1B	1x13mm FIRESTOP	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m^2)	R2.5 GW Ceiling	54	54	41
			Carpet + foam underlay	R2.5 GW Ceiling	53	53	71
CT30.1C	1x13mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber flooring (min 8.5kg/m^2)	R3.0 GW Ceiling	55	55	43

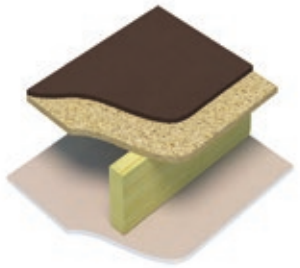
* **R2.5 GW Ceiling** – R2.5 ceiling glasswool
R3.0 GW Ceiling – R3.0 ceiling glasswool

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CT60.0

FIRE RESISTANCE RATING 60/60/60
FROM BELOW

FRR Basis: FCO-1658, FCO-0568, FC10757-001-TO



Direct-fixed system shown

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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT60.2A	1x16mm FIRESTOP	Direct-fixed	Timber flooring (min 8.5kg/m^2)	R2.5 GW Ceiling	49	48	38
			Carpet + foam underlay	R2.5 GW Ceiling	48	47	69
CT60.2B	1x16mm FIRESTOP	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m^2)	R2.5 GW Ceiling	55	55	42
			Carpet + foam underlay	R2.5 GW Ceiling	54	54	71
CT60.2C	1x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber flooring (min 8.5kg/m^2)	R3.0 GW Ceiling	56	56	44

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool
R3.0 GW Ceiling – R3.0 ceiling glasswool

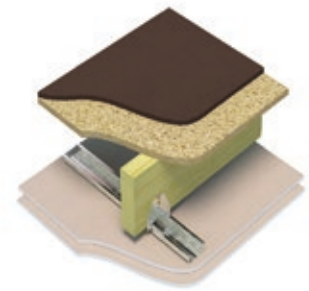
Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER TIMBER FLOOR

CT60.1

FIRE RESISTANCE RATING 60/60/60
FROM BELOW

FRR Basis: FCO-1658



Furred system shown

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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT60.1A	2x13mm FIRESTOP	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m^2) + min 4.5mm acoustic underlay†	R2.5 GW Ceiling	57	57	56
			Carpet + foam underlay	R2.5 GW Ceiling	56	56	72
			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	58	58	53
CT60.1B	2x13mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber flooring (min 8.5kg/m^2)	R3.0 GW Ceiling	58	58	47
			Min 6mm ceramic floor tiles + 6mm cement sheet or 10mm Fiberock (total mass min 15kg/m^2)	R3.0 GW Ceiling	58	58	53
CT60.1C	2x13mm FIRESTOP	Furred @ 600mm ctrs with Embelton Acoustic Mounts	Timber flooring (min 8.5kg/m^2)	R2.5 GW Ceiling	58	58	49
			Min 6mm ceramic floor tiles + 6mm cement sheet or 10mm Fiberock (total mass min 15kg/m^2)	R2.5 GW Ceiling	59	59	50

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool
R3.0 GW Ceiling – R3.0 ceiling glasswool
† **4.5mm Acoustic underlay** – Regupol 4515 acoustic underlay or equivalent

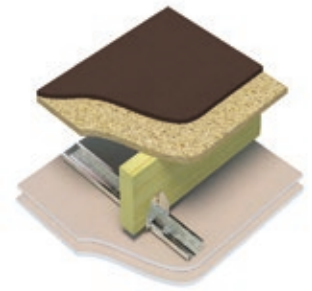
Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER TIMBER FLOOR

CT60.2

FIRE RESISTANCE RATING 60/60/60
FROM BELOW

FRR Basis: FCO-1658



Furred system shown

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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
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	59	59	56
			Carpet + foam underlay	R2.5 GW Ceiling	58	58	72
			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	60	60	53
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	60	60	47
			Min 6mm ceramic floor tiles + 6mm cement sheet or 10mm Fiberock (total mass min 15kg/m^2)	R3.0 GW Ceiling	61	61	48
CT60.2C	1x13mm FIRESTOP + 1x16mm FIRESTOP	Furred @ 600mm ctrs with Embelton Acoustic Mounts	Timber flooring (min 8.5kg/m^2)	R2.5 GW Ceiling	60	60	49
			Min 6mm ceramic floor tiles + 6mm cement sheet or 10mm Fiberock (total mass min 15kg/m^2)	R2.5 GW Ceiling	61	61	50

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool
R3.0 GW Ceiling – R3.0 ceiling glasswool
† **4.5mm Acoustic underlay** – Regupol 4515 acoustic underlay or equivalent

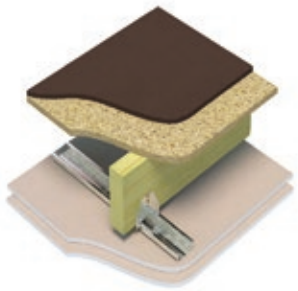
Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER TIMBER FLOOR

CT90.1

FIRE RESISTANCE RATING 90/90/90
FROM BELOW

FRR Basis: FCO-1658, FCO-0629



Furred system shown

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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT90.1A	2x16mm FIRESTOP	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m^2) + min 4.5mm acoustic underlay†	R2.5 GW Ceiling	58	58	57
			Carpet + foam underlay	R2.5 GW Ceiling	57	57	72
			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	59	59	53
CT90.1B	2x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber flooring (min 8.5kg/m^2)	R3.0 GW Ceiling	59	59	48
			Min 6mm ceramic floor tiles + 6mm cement sheet or 10mm Fiberock (total mass min 15kg/m^2)	R3.0 GW Ceiling	60	60	48
CT90.1C	2x16mm FIRESTOP	Furred @ 600mm ctrs with Embelton Acoustic Mounts	Timber flooring (min 8.5kg/m^2)	R2.5 GW Ceiling	59	59	50
			Min 6mm ceramic floor tiles + 6mm cement sheet or 10mm Fiberock (total mass min 15kg/m^2)	R2.5 GW Ceiling	60	60	50

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool
R3.0 GW Ceiling – R3.0 ceiling glasswool
† **4.5mm Acoustic underlay** – Regupol 4515 acoustic underlay or equivalent

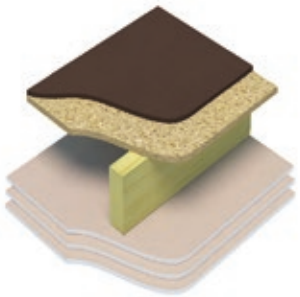
Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER TIMBER FLOOR

CT120.1

FIRE RESISTANCE RATING
120/120/120
FROM BELOW

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



Direct-fixed system shown

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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT120.1A	3x16mm FIRESTOP	Direct-fixed	Timber flooring (min 8.5kg/m²)	R2.5 GW Ceiling	54	53	43
			Carpet + foam underlay	R2.5 GW Ceiling	53	52	71
CT120.1B	3x16mm FIRESTOP	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m²)	R2.5 GW Ceiling	60	60	47
			Carpet + foam underlay	R2.5 GW Ceiling	59	59	73
CT120.1C	3x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber flooring (min 8.5kg/m²)	R3.0 GW Ceiling	61	61	49

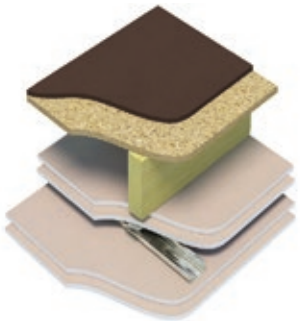
* **R2.5 GW Ceiling** – R2.5 ceiling glasswool
R3.0 GW Ceiling – R3.0 ceiling glasswool

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CT120.2

FIRE RESISTANCE RATING
120/120/120
FROM BELOW

FRR Basis: FCO-1856



Direct-fixed system shown

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 TE405-20S01

SYSTEM	CEILING LINING	FIXING	FLOORING TYPE	INSULATION*	R_w	STC	IIC
CT120.2A	2x16mm FIRESTOP + furring channel + 2x16mm FIRESTOP	Direct-fixed	Timber flooring (min 8.5kg/m²)	R2.5 GW Ceiling	58	57	50
			Carpet + foam underlay	R2.5 GW Ceiling	57	56	70
CT120.2B	2x16mm FIRESTOP + furring channel + 2x16mm FIRESTOP	Furred @ 600mm ctrs	Timber flooring (min 8.5kg/m²)	R2.5 GW Ceiling	64	64	54
			Carpet + foam underlay	R2.5 GW Ceiling	63	63	74
CT120.2C	2x16mm FIRESTOP + furring channel + 2x16mm FIRESTOP	Furred @ 600mm ctrs with Rondo STWC Sound Isolation Mounts	Timber flooring (min 8.5kg/m²)	R3.0 GW Ceiling	65	65	56

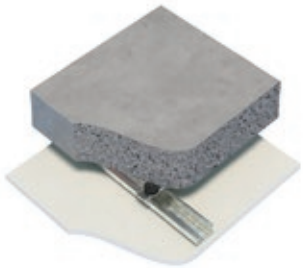
* **R2.5 GW Ceiling** – R2.5 ceiling glasswool
R3.0 GW Ceiling – R3.0 ceiling glasswool

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER CONCRETE FLOOR

CC.1

FIRE RESISTANCE RATING
(refer to slab FRR)



Bare concrete floor shown

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 (100mm nom ceiling cavity)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S02

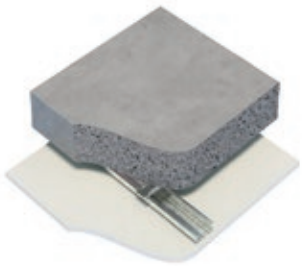
SYSTEM	CEILING LINING	FLOORING TYPE	SLAB THICKNESS	150mm			200mm		
			INSULATION*	R_w	STC	IIC	R_w	STC	IIC
CC.1A	1x13mm SHEETROCK	Bare concrete	Nil	58	59	42	62	63	45
			50G11, 50P7	62	63	45	66	67	48
		Timber flooring (min 8.5kg/m^2) + min 4.5mm acoustic underlay†	Nil	58	59	55	62	63	58
			50G11, 50P7	62	63	58	66	67	61
		Carpet + foam underlay	Nil	58	59	77	62	63	80
			50G11, 50P7	62	63	78	66	67	81
		Tiled floor + min 4.5mm acoustic underlay†	Nil	58	59	54	62	63	57
			50G11, 50P7	62	63	57	66	67	60

* **50G11** – 50mm partition 11kg/m^3 glasswool **50P7** – 50mm polyester insulation 7kg/m^3
† **4.5mm Acoustic underlay** – Regupol 4515 acoustic underlay or equivalent

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.

CC.2

FIRE RESISTANCE RATING
(refer to slab FRR)



Bare concrete floor shown

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 with Rondo STWC Sound Isolation Mounts (100mm nom ceiling cavity)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S02

SYSTEM	CEILING LINING	FLOORING TYPE	SLAB THICKNESS	150mm			200mm		
			INSULATION*	R_w	STC	IIC	R_w	STC	IIC
CC.2A	1x13mm SHEETROCK	Bare concrete	Nil	58	59	45	62	63	48
			50G11, 50P7	62	63	48	66	67	51
		Timber flooring (min 8.5kg/m^2)	Nil	58	59	49	62	63	52
			50G11, 50P7	62	63	52	66	67	55
		Tiled floor	Nil	58	59	45	62	63	48
			50G11, 50P7	62	63	48	66	67	51

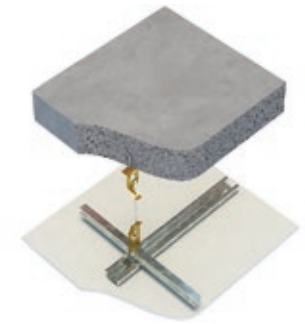
* **50G11** – 50mm partition 11kg/m^3 glasswool **50P7** – 50mm polyester insulation 7kg/m^3

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILING UNDER CONCRETE FLOOR

CC.3

FIRE RESISTANCE RATING
(refer to slab FRR)



Bare concrete floor shown

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 (300mm nom ceiling cavity)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S02

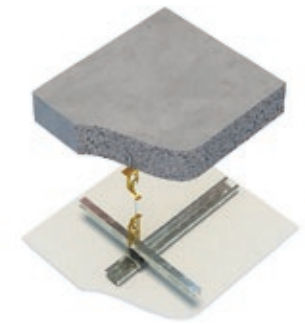
SYSTEM	CEILING LINING	FLOORING TYPE	SLAB THICKNESS	150mm			200mm		
			INSULATION*	R_w	STC	IIC	R_w	STC	IIC
CC.3A	1x13mm SHEETROCK	Bare concrete	Nil	60	60	46	64	64	49
			50G11, 50P7	64	64	49	68	68	52
		Timber flooring (min 8.5kg/m^2) + min 4.5mm acoustic underlay†	Nil	60	60	59	64	64	62
			50G11, 50P7	64	64	62	68	68	65
		Carpet + foam underlay	Nil	60	60	78	64	64	81
			50G11, 50P7	64	64	79	68	68	82
		Tiled floor + flexible adhesive	Nil	60	60	49	64	64	52
			50G11, 50P7	64	64	52	68	68	55

* **50G11** – 50mm partition 11kg/m^3 glasswool **50P7** – 50mm polyester insulation 7kg/m^3
† **4.5mm Acoustic underlay** – Regupol 4515 acoustic underlay or equivalent

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.

CC.4

FIRE RESISTANCE RATING
(refer to slab FRR)



Bare concrete floor shown

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 with Rondo STSU Sound Isolation Hangers (300mm nom ceiling cavity)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S02

SYSTEM	CEILING LINING	FLOORING TYPE	SLAB THICKNESS	150mm			200mm		
			INSULATION*	R_w	STC	IIC	R_w	STC	IIC
CC.4A	1x13mm SHEETROCK	Bare concrete	Nil	60	60	49	64	64	52
			50G11, 50P7	64	64	52	68	68	55
		Timber flooring (min 8.5kg/m^2)	Nil	60	60	53	64	64	56
			50G11, 50P7	64	64	56	68	68	59
		Tiled floor	Nil	60	60	49	64	64	52
			50G11, 50P7	64	64	52	68	68	55

* **50G11** – 50mm partition 11kg/m^3 glasswool **50P7** – 50mm polyester insulation 7kg/m^3

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILINGS UNDER ROOF

CR.1

NON-FIRE-RATED

Pitched roof shown

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 TE405-20S08

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	STC	R_W	STC	R_W	STC
CR.1A	1x10mm SHEETROCK	Direct-fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling	42	43	–	–	–	–
CR.1D	2x10mm SHEETROCK	Direct-fixed to roof trusses @ 600mm ctrs	R2.5 GW Ceiling	47	48	–	–	–	–

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool

CR.2

NON-FIRE-RATED

Pitched roof shown

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 TE405-20S08

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	STC	R_W	STC	R_W	STC
CR.2A	1x10mm SHEETROCK	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling	43	44	42	43	40	41
CR.2D	2x10mm SHEETROCK	On furring channels @ 600mm ctrs (nom 30mm gap)	R2.5 GW Ceiling	48	49	47	48	45	46

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.

CEILINGS UNDER ROOF

CR.3

NON-FIRE-RATED

Pitched roof shown

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 TE405-20S08

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	STC	R_w	STC	R_w	STC
CR.3A	1x10mm SHEETROCK	On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)	R2.5 GW Ceiling	48	49	47	48	45	46
CR.3D	2x10mm SHEETROCK	On furring channels @ 600mm ctrs attached with Rondo STWC Sound Isolation Mounts (nom 50mm gap)	R2.5 GW Ceiling	54	55	53	54	51	52

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CR.4

NON-FIRE-RATED

Pitched roof shown

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 TE405-20S08

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	STC	R_w	STC	R_w	STC
CR.4A	1x10mm SHEETROCK	Suspended	R2.5 GW Ceiling	–	–	47	48	45	46
CR.4D	2x10mm SHEETROCK	Suspended	R2.5 GW Ceiling	–	–	52	53	50	51

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.

CEILINGS UNDER ROOF

CR.5

NON-FIRE-RATED

Pitched roof shown

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 TE405-20S08

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	STC	R_w	STC	R_w	STC
CR.5A	1x10mm SHEETROCK	Suspended with Rondo Sound Isolation Hangers	R2.5 GW Ceiling	–	–	50	51	48	49
CR.5D	2x10mm SHEETROCK	Suspended with Rondo Sound Isolation Hangers	R2.5 GW Ceiling	–	–	55	56	53	54

* **R2.5 GW Ceiling** – R2.5 ceiling glasswool

Notes:
Refer to Table 14, page 93, for maximum spans of Rondo 129 furring channel.
Refer to Table 15, page 93, for maximum spans and spacings of furring channels with acoustic mounts.

CEILINGS UNDER ROOF – FIRE UPGRADE

CR

FIRE RESISTANCE RATING
(refer to table)

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

Pitched roof shown

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

FIRE-RATINGS

SYSTEM	FRR	LINING
CR30.1A	30/30/30 from below	1x13mm FIRESTOP
CR30.2A	30/30/30 from below	1x16mm FIRESTOP
CR60.1A	60/60/60 from below	2x13mm FIRESTOP
CR60.2A	60/60/60 from below	1x13mm FIRESTOP + 1x16mm FIRESTOP
CR90.1A	90/90/90 from below	2x16mm FIRESTOP
CR120.1A	120/120/120 from below	3x16mm FIRESTOP
CR120.2A	120/120/120 from below	2x16mm FIRESTOP + Furring +2x16mm FIRESTOP

SPANNING CEILINGS C-SECTION

CS

FIRE RESISTANCE RATING
(refer to table)

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

System CS60.1A shown

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 TE405-20S08

SYSTEM	FRR	TOP LINING	BOTTOM LINING	STUD SIZE mm	150		MAX SPANS FOR POINT LOAD AT MIDSPAN† mm	
				BMT mm	0.75			
				INSULATION*	R_w	STC	1400N	900N
CS60.1A	60/60/60 from above only	1x16mm FIRESTOP	1x16mm FIRESTOP	Nil	39	38	2000	3000
				90G11, 90P14	46	45		
CS90.1A	90/90/90 from above only	2x13mm FIRESTOP	1x13mm FIRESTOP	Nil	40	39	2000	2900
				90G11, 90P14	49	48		
CS120.1A	120/120/120 from above only	2x16mm FIRESTOP	1x16mm FIRESTOP + 1x10mm REGULAR	Nil	46	45	1900	2650
				90G11, 90P14	52	51		
CS120.1B	120/120/120 from above 60/60/60 from below	2x16mm FIRESTOP	2x16mm FIRESTOP	Nil	47	46	1900	2650
				90G11, 90P14	52	51		
CS120.1C	120/120/120 from both sides	2x16mm FIRESTOP	3x16mm FIRESTOP	Nil	49	48	1850	2500
				90G11, 90P14	54	53		
CS180.1A	180/180/180 from above only	2x25mm SHAFTLINER	1x16mm FIRESTOP	Nil	48	47	1900	2600
				90G11, 90P14	54	53		

* **90G11** – 90mm partition 11kg/m³ glasswool **90P14** – 90mm polyester insulation 14kg/m³
† Maximum spans are based on non-trafficable ceilings in accordance with AS/NZS 1170.1 cl 3.5.2

Note:
End connections using Rondo SWC3 or 201 web cleats

NOTES

ACOUSTIC CEILINGS – TILES

APPLICATION GUIDELINES

PANEL	FACE TEXTURE*	APPLICATION																						
		AIRPORTS	BANKS	BOARDROOMS / CONFERENCE	CINEMAS / THEATRES	COMPUTER ROOMS	FACTORIES / WORKSHOPS	FOODHALLS	GYMNASIUMS	HOSPITALS / MEDICAL CENTRES	LABORATORIES / CLEANROOMS	LIBRARIES	LIGHT INDUSTRIAL CONSTRUCTION	LOBBIES / RECEPTION AREAS	OFFICES	OPEN PLAN OFFICES	RESTAURANTS / CAFES	RETAIL	SCHOOLS	SERVICE STATIONS	SHOPPING CENTRES	SHOWROOMS / EXHIBITION AREAS	SWIMMING POOLS	WASHROOMS	FIRE-RATED AREAS
CLEAN ROOM CP CLASS 10M-100M (PERF)	F					●	●	●	●	●	●	●			●		●	●	●	●	●		●	●	●
IMPRESSIONS CLIMAPLUS™	F	●	●	●	●					●		●	●		●			●	●	●	●	●			
IMPRESSIONS HIGH NRC CP	F	●	●	●	●					●		●			●	●	●	●	●		●	●			
MARS CLIMAPLUS	F	●	●	●	●	●		●		●	●	●		●	●	●	●	●	●		●	●			
MARS CLEANROOM CP	F					●	●	●		●	●						●			●			●	●	
MARS CP HEALTHCARE	F					●		●		●	●						●		●					●	
MARS CLIMAPLUS HIGH NRC	F	●	●	●	●			●		●		●		●	●	●	●	●	●	●	●	●			
NOVA WHITE	S						●						●				●		●	●	●			●	
OLYMPIA MICRO CLIMAPLUS	F	●	●	●	●							●	●	●	●			●			●	●			
OLYMPUS MAX CLIMAPLUS	F	●	●	●	●							●	●	●	●	●	●	●	●		●	●			
ORION 85 CLIMAPLUS	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	●	●						●	●			●				●	●	●		●				●
SKYROCK CLASSIC (White & Black)	F	●	●	●	●			●		●		●	●	●	●	●	●	●	●	●	●	●			

* F = Fine
M = Medium
S = Smooth

ACOUSTIC CEILINGS – TILES

TECHNICAL DATA

PANEL	EDGE [1]	CEILING GRID [2]	NRC	CAC MINIMUM	LR	VOC [3] EMISSIONS	ANTI-[4] MOULD & MILDEW	RECYCLED CONTENTS	PANEL WEIGHT kg/m²	PANEL [5] COST CATEGORY
CLEAN ROOM CLIMAPLUS CLASS 100	SQ	DX	—	35	0.79	—	—	55%	5.8	**$$$$**
CLEAN ROOM CP CLASS 10M–100M	SQ	DX	0.55	35	0.79	—	—	55%	5.8	**$$$$**
IMPRESSIONS CLIMAPLUS	SQ SLT FLB	DX/DXT	0.60	33	0.84	Low	●	44%	3.6	**$**
IMPRESSIONS HIGH NRC CP	SQ SLT FLB	DX/DXT	0.70	33	0.86	Low	●	57%	5.5	**$$$**
MARS CLIMAPLUS	SQ SLT FLB	DX/DXT	0.70	35	0.89	Low	●	80%	5.0	**$$$$**
MARS CLEANROOM CP	SQ	DX/DXT/ DXH	0.75	35	0.89	Low	●	69%	5.3	**$$$$**
MARS CLIMAPLUS HEALTHCARE	SQ SLT FLB	DX/DXT	0.60/0.85	35–40	0.90	Low	●	66–71%	5.2	**$$$$**
MARS CLIMAPLUS HIGH NRC	SQ SLT FLB	DX/DXT	0.80/0.90	30–35	0.90	Low	●	66–69%	5.9	**$$$$**
NOVA WHITE	SQ	DX	–	–	N/A	Low	N/A	N/A	7.0	**$**
OLYMPIA MICRO CLIMAPLUS	SQ SLT FLB	DX/DXT	0.50	30–35	0.88	Low	●	46%	4.4	**$$**
OLYMPUS MAX CLIMAPLUS	SQ SLT FLB	DX/DXT	0.70	35	0.88	Low	●	61%	4.1	**$$$**
ORION 85 CLIMAPLUS	SQ SLT FLB	DX/DXT	0.85	23–24	0.87	Low	●	67%	3.8	**$$$**
RADAR CLIMAPLUS	SQ SLT FLB	DX/DXT	0.60	33–34	0.84	Low	●	28–44%	3.6	**$**
RADAR CLIMAPLUS ILLUSIONS	SLT	DX	0.55	35	0.84	Low	●	44%	4.2	**$$**
RADAR CLIMAPLUS HIGH NRC	SQ/SLT FLB	DX/DXT	0.70	33–35	0.84	Low	●	57%	4.4	**$$$**
RADAR CLIMAPLUS HIGH NRC/CAC	SQ SLT FLB	DX/DXT	0.70	40	0.84	Low	●	43–57%	5.8	**$$$**
RADAR CERAMIC CLIMAPLUS	SQ	DX	0.50	40	0.82	Low	○	44%	8.0	**$$$$**
ROCK FACE CLIMAPLUS	SQ	DX/DXW	0.55	35	0.86	Low	●	50%	4.9	**$$$**
SKYROCK CLASSIC	SQ	DX	0.9	–	0.85	Low	—	15%	1.1	**$$$**

Notes:

[1] **EDGE PROFILES**
SQ = Square
SL = Shadowline
SLT = Shadowline Tapered
FL = Fineline
FLB = Fineline Bevel

[2] **GRID TYPES**
DX = 24mm face width
DXT = 15mm face width
DXH = 24mm face width, Healthcare
DXW = 38mm face width

[3] **VOC Emissions** (VOC Class)
Low = Low-emitting per standards established by the Collaborative for High-Performance Schools (CHPS), following California Specification 01350 testing methods – defined as having less than 13.5 ppb/0.017 mg/m3.

[4] ● **CLIMAPLUS Superior Performance**
Contains a broad-spectrum anti-microbial treatment on the face and back of the panel, which 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.

[5] **PANEL COST CATEGORY**
Economical = $
Moderate = $$
Mid-Range = $$$
Premium = $$$$

OVER PARTITION SYSTEMS

USG BORAL ACOUSTIC CEILING PANELS CLASSIFICATION				
CEILING PANEL GROUP	PRODUCT NAME	PANEL THICKNESS	NRC	CAC
GROUP A	RADAR CLIMAPLUS	16mm	0.60	33–35
	IMPRESSIONS CLIMAPLUS	16mm	0.60	33–35
	IMPRESSIONS CP HIGH NRC	19mm	0.70	33–35
	RADAR CLIMAPLUS HIGH NRC	19mm	0.70	33–35
GROUP B	MARS CLIMAPLUS HEALTHCARE	19mm	0.60–0.85	35–40
	MARS CLEANROOM CP	19mm	0.75	35–39
	MARS CLIMAPLUS HIGH NRC	22mm	0.80–0.90	30–35
	OLYMPIA MICRO CLIMAPLUS	15mm	0.50	30–35
	OLYMPUS MAX CLIMAPLUS	19mm	0.70	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

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
$R_w \leq 35$	**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	13mm SHEETROCK	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
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/m² 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

* **50G11** – 50mm partition 11kg/m³ glasswool **150G11** – 2x75mm or 3x50mm partition 11kg/m³ glasswool

Notes:
- Refer to USG BORAL CEILING PANEL CLASSIFICATION table on page 116 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 (i.e., 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

TYPICAL LAYOUTS

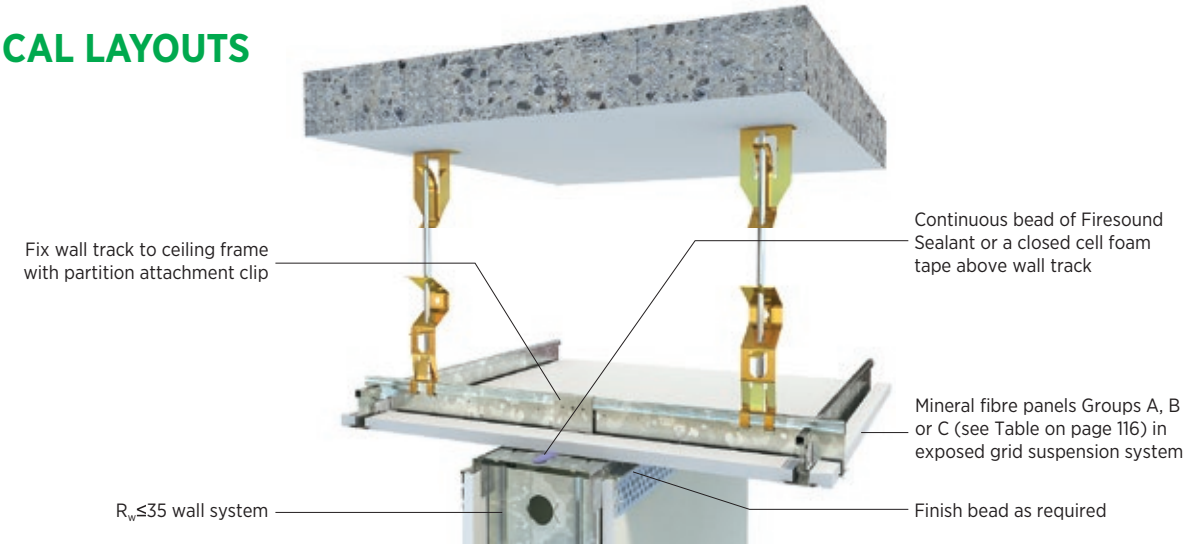


Figure 29: **Ceiling Configuration to Maintain an R_w≤35 Wall Acoustic Rating**
(System OP.1 shown)

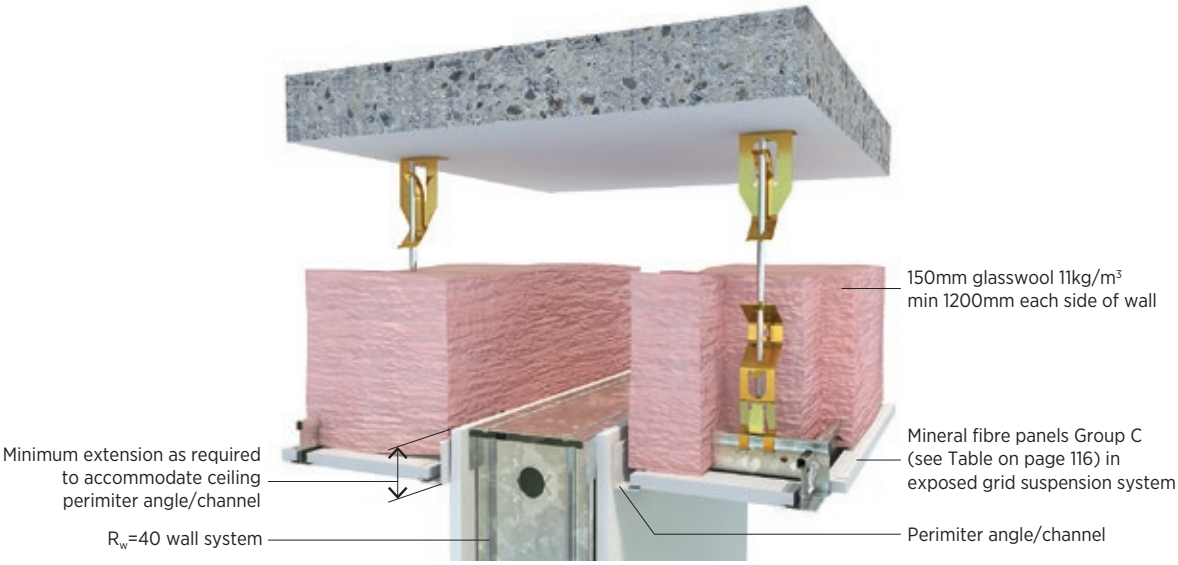


Figure 30: **Ceiling Configuration to Maintain an R_w=40 Wall Acoustic Rating**
(System OP.4 shown)

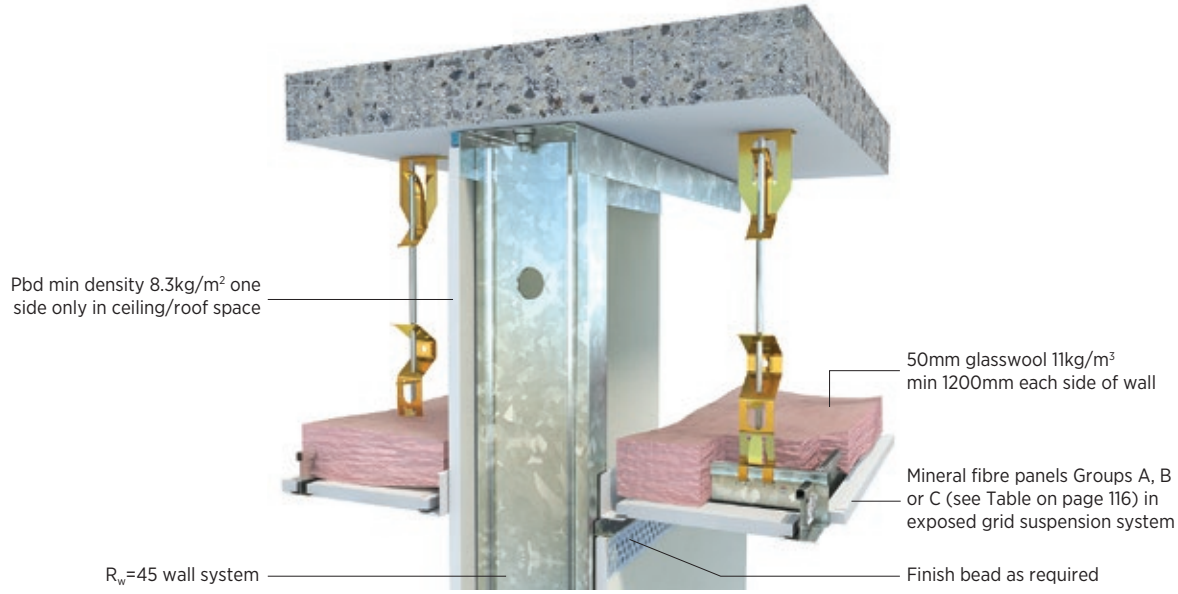


Figure 31: **Ceiling Configuration to Maintain an R_w=45 Wall Acoustic Rating**
(System OP.8 shown)

MULTI-RESIDENTIAL

Partiwall®
IntRwall™

SYSTEMS + INNOVATIVE SYSTEMS SOLUTIONS

INTRODUCTION

MULTI-RESIDENTIAL SYSTEMS

PARTIWALL®

DESCRIPTION

USG Boral Partiwall is a family of timber-framed separating wall systems for intertenancy buildings.

Partiwall is a twin stud wall system incorporating a 25mm Shaftliner plasterboard fire barrier within the wall cavity. Cavity insulation is placed on one or both sides of the wall as required to achieve stated acoustic ratings.

Shaftliner panels are held in position by lightweight H-studs that are fixed to timber framing on both sides with aluminium clips. In the event of fire, the aluminium clips on the fire side will melt, while the Shaftliner fire barrier is supported by, and provides protection to, the structure on the opposite side.

Figure 32: **Partiwall System**

FEATURES AND BENEFITS

- No wet trades required
- No additional trades required at framing stage
- Permits easy incorporation of services and service penetrations in internal linings without the need for fire treatment
- Wall linings are installed at the plastering stage as per normal installation specifications

NOTE:

The Partiwall system is designed to provide fire protection to the adjacent dwelling and not to dwellings above or below.

DESIGN OPTIONS

Partiwall systems are available in three basic fire-rated configurations.

TABLE 17: **PARTIWALL SYSTEM TYPES**

SYSTEM TYPE	FIRE BARRIER	FRR
PWT60.1	1x25mm SHAFTLINER	60/60/60
PWT90.1	1x25mm SHAFTLINER + 1x16mm FIRESTOP	90/90/90
PWT90.2	2x25mm SHAFTLINER	90/90/90

All fire-rated configurations are available with a wide range of outer linings, including hybrid linings with different impact- and/or water-resistance properties on each side of the wall.

All Partiwall systems listed in this manual achieve acoustic ratings of STC 60/R_w59 minimum.

MATERIALS

FIRE BARRIER

- 25mm Shaftliner
- 25mm H-studs or 50mm I-studs
- Rondo 25mm or 50mm steel track
- Partiwall aluminium clips
- USG Boral Firepack® mineral wool packer

LININGS

- 10mm/13mm Soundstop plasterboard
- 10mm/13mm Multistop 4 plasterboard
- 10mm Sheetrock plasterboard

INSULATION

- R2.0 wall 90mm glasswool insulation
- 110mm fibreglass insulation

SEALANT

H.B. Fuller Firesound sealant

FASTENERS

Refer to the Partiwall Installation Manual for fastener types used in the construction of a Partiwall system

DESIGN CONSIDERATIONS

MAXIMUM HEIGHTS AND LOADS

- Overall height of Shaftliner fire barrier must not exceed 12.0m.
- Spacing between aluminium clips supporting H-studs or I-studs must not exceed 3.0m vertically and 600mm horizontally.
- Timber framing to be designed in accordance with NZS 3604 or specifically engineered in accordance with AS/NZS 1170 by a suitably qualified structural engineer to meet NZBC requirements and relevant New Zealand Standards.
  Note: Stud spacing not to exceed 600mm centres.
- The Partiwall® system is suitable for use in all NZS 3604 wind and earthquake zones. The Partiwall® system may also be specifically engineered for other designs using AS/NZS 1170.

FIRE-RATING

- Linings in the occupancy areas do not need be fire-rated and are constructed using the normal installation and finishing methods outlined in the USG Boral Plasterboard Installation Manual NZ.
- Normal service penetrations are allowed through outer linings and are not required to be fire-rated.
- Service penetrations through the Shaftliner fire barrier are allowed only in the roof space (refer to the Partiwall manual for details of approved penetrations). There should be no other penetrations through the fire barrier.
- Use only the specified Partiwall aluminium clips to attach the H-studs or I-studs to framing members. Other than the clips, there should be no attachments to the fire barrier.

ACOUSTICS

- All Partiwall systems outlined in this manual are covered by acoustical opinion RT&A TE-405-20S06 from acoustical consultants Renzo Tonin & Assoc.
- Partiwall® satisfies NZBC acoustic requirements for separating walls of STC 55. Soil and waste pipes, and other cable services, are permitted within the wall cavity. To maintain acoustic performance, service pipes must not be in contact with the Shaftliner fire barrier.
- Small penetrations in outer linings (i.e., switches, power points, light fittings and pipes) do not need to be acoustically sealed; however, Shaftliner fire barrier base and internal lining junctions with floors must be sealed with H.B. Fuller Firesound sealant.
- Stair stringers and treads should be kept clear of the separating wall in order to reduce the likelihood of stair impact sound travelling through the wall.

WET AREAS

Wet areas must be waterproofed as per the wet area details contained in the USG Boral Plasterboard or Wet Area Installation Manuals NZ.

Partiwall systems extending into wet areas must incorporate water-resistant linings.

INSTALLATION

Partiwall systems must be installed strictly in accordance with USG Boral installation specifications in order to achieve designed fire and acoustic ratings. Refer to the Partiwall manual for installation specifications.

NZBC COMPLIANCE

USG Boral has all the necessary evidence to confirm that Partiwall® complies with the relevant provisions of the NZBC as at 1 April 2017.

Partiwall® complies with NZBC:

- Structure Clause B1
- Durability Clause B2
- Fire Affecting Areas Beyond the Fire Source Clause C3
- Hazardous Building Materials Clause F2
- Airborne/Impact Sound Clause G6

Refer to the USG Boral Partiwall® System Technical Statement for further compliance details.

APPRAISAL/CODEMARK

USG Boral Partiwall® has been assessed by BRANZ and CertMark as meeting the relevant NZBC performance clauses.

For full installation instructions, refer to the USG Boral Partiwall Installation Manual NZ.

BRANZ Appraised
Appraisal No.898 (2015)

CODEMARK™

PARTIWALL®

PWT60.1

FIRE RESISTANCE RATING
LB **60/60/60**
FROM BOTH SIDES

FRR Basis: FCO-2016, FSV 381

Side 1:
- Non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25mm SHAFTLINER™ between 25mm H-studs @ 600mm ctrs

Side 2:
- Non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

Side 1: PWT60.1X
- 2 layers of non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25mm SHAFTLINER™ between 25mm H-studs @ 600mm ctrs

Side 2:
- 2 layers of non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S06

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WIDTH mm	STUD SIZE (GAP) mm	70 (20)		70 (40) 90 (20)	
				INSULATION*	R_W	STC	R_W	STC
PWT60.1A	1x10mm SOUNDSTOP	1x10mm SOUNDSTOP	265	R2.0 GW wall fibreglass insulation (both cavities)	–	–	63	64
PWT60.1B	1x13mm SOUNDSTOP	1x13mm SOUNDSTOP	231	R2.0 GW wall fibreglass insulation (both cavities)	62	63	–	–
			271	R2.0 GW wall fibreglass insulation (both cavities)	–	–	64	65
				110mm fibreglass insulation (one cavity only)	–	–	59	60
PWT60.1AC	1x10mm SOUNDSTOP	1x10mm MULTISTOP 4	265	R2.0 GW wall fibreglass insulation (both cavities)	–	–	63	64
				110mm fibreglass insulation (both cavities)	–	–	65	66
PWT60.1AD	1x13mm SOUNDSTOP	1x10mm MULTISTOP 4	228	90G24 (both cavities)	61	62	–	–
			268	90G24 (both cavities)	–	–	64	65
PWT60.1AE	1x10mm MULTISTOP 4	1x10mm MULTISTOP 4	265	R2.0 GW wall fibreglass insulation (both cavities)	–	–	63	64
PW60.1X	2x10mm SHEETROCK	2x10mm SHEETROCK	285	R2.0 GW wall fibreglass insulation (both cavities)	62	63	64	65
				110mm fibreglass insulation (both cavities)	–	–	65	66

* **R2.0 GW** wall fibreglass insulation and **110mm** fibreglass insulation – density 11kg/m³
90G24 glasswool insulation – density 24kg/m³

PARTIWALL®

PWT90.1

FIRE RESISTANCE RATING
LB **90/90/90**
FROM BOTH SIDES

FRR Basis: FCO-2713

Side 1:
- Non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25mm SHAFTLINER™ between 25mm H-studs @ 600mm ctrs + 1x16mm FIRESTOP® direct-fixed to Shaftliner™

Side 2:
- Non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S06

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WIDTH mm	STUD SIZE (GAP) mm	70 (20)		70 (40) 90 (20)	
				INSULATION*	R_w	STC	R_w	STC
PWT90.1B	1x10mm SOUNDSTOP	1x10mm SOUNDSTOP	245	R2.0 GW wall fibreglass insulation (both cavities)	64	65	–	–
			285	R2.0 GW wall fibreglass insulation (both cavities)	–	–	67	68
PWT90.1C	1x13mm SOUNDSTOP	1x13mm SOUNDSTOP	290	R2.0 GW wall fibreglass insulation (one cavity only)	–	–	62	63
PWT90.1AA	1x13mm SHEETROCK	1x13mm SHEETROCK	290	R2.0 GW wall fibreglass insulation (one cavity only)	–	–	65	66
PWT90.1AC	1x10mm MULTISTOP 4	1x10mm MULTISTOP 4	285	R2.0 GW wall fibreglass insulation (both cavities)	–	–	67	68
PWT90.1AD	1x10mm SOUNDSTOP	1x10mm MULTISTOP 4	285	R2.0 GW wall fibreglass insulation (both cavities)	–	–	67	68
PWT90.1AE	1x13mm SOUNDSTOP	1x10mm MULTISTOP 4	245	R2.0 GW wall fibreglass insulation (both cavities)	64	65	–	–
			285	R2.0 GW wall fibreglass insulation (both cavities)	–	–	68	69
PWT90.1AF	1x13mm MULTISTOP 4	1x13mm MULTISTOP 4	250	R2.0 GW wall fibreglass insulation (both cavities)	66	67	–	–
			290	R2.0 GW wall fibreglass insulation (both cavities)	–	–	69	70
PWT90.1AG	1x13mm SOUNDSTOP	1x13mm MULTISTOP 4	290	R2.0 GW wall fibreglass insulation (one cavity only)	–	–	62	63

* **R2.0 GW** wall fibreglass insulation – density 11kg/m³

PARTIWALL®

PWT90.2

FIRE RESISTANCE RATING
LB **90/90/90**
FROM BOTH SIDES

FRR Basis: FCO-1446, FCO-2016

Side 1:
- Non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 2x25mm SHAFTLINER™ between 51mm I-studs @ 600mm ctrs

Side 2:
- Non-fire resistant lining (refer to table)
- Timber framing
- 20mm min gap between timber frame and fire barrier
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S06

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WIDTH mm	STUD SIZE (GAP) mm	70 (20)		70 (40) 90 (20)	
				INSULATION*	R_w	STC	R_w	STC
PWT90.2B	1x10mm SOUNDSTOP	1x10mm SOUNDSTOP	250	R2.0 GW wall fibreglass insulation (both cavities)	64	65	–	–
			290	R2.0 GW wall fibreglass insulation (both cavities)	–	–	68	69
				110mm fibreglass insulation (one cavity only)	–	–	62	63
PWT90.2C	1x13mm SOUNDSTOP	1x13mm SOUNDSTOP	296	R2.0 GW wall fibreglass insulation (one cavity only)	–	–	62	63
PWT90.2AD	1x10mm MULTISTOP 4	1x10mm MULTISTOP 4	290	R2.0 GW wall fibreglass insulation (both cavities)	–	–	68	69
PWT90.2AE	1x10mm SOUNDSTOP	1x10mm MULTISTOP 4	290	R2.0 GW wall fibreglass insulation (both cavities)	–	–	68	69
PWT90.2AF	1x13mm SOUNDSTOP	1x10mm MULTISTOP 4	253	R2.0 GW wall fibreglass insulation (both cavities)	66	67	–	–
			293	R2.0 GW wall fibreglass insulation (one cavity only)	–	–	62	63
PWT90.2AG	1x13mm SOUNDSTOP	1x13mm MULTISTOP 4	256	R2.0 GW wall fibreglass insulation (both cavities)	67	68	–	–
			296	R2.0 GW wall fibreglass insulation (one cavity only)	–	–	62	63
PWT90.2AH	1x13mm MULTISTOP 4	1x13mm MULTISTOP 4	256	R2.0 GW wall fibreglass insulation (both cavities)	67	68	–	–
			296	R2.0 GW wall fibreglass insulation (both cavities)	–	–	70	71
				110mm fibreglass insulation (one cavity only)	–	–	64	65

* **R2.0 GW** wall fibreglass insulation and **110mm** fibreglass insulation – density 11kg/m^3

INTRWALL™

DESCRIPTION

IntRwall systems are NLB separating wall systems utilising 25mm Shaftliner plasterboard fire barrier with various configurations of outer linings on both sides. Cavity insulation is placed on one or both sides of the wall as required to achieve stated acoustic ratings.

Shaftliner panels are held in position by light-gauge steel I-studs or H-studs.

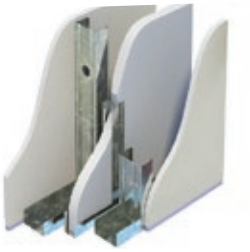


Figure 33: **IntRwall System IW60.3**

FEATURES AND BENEFITS

- A simple, panelised lightweight system that can be installed by a plastering contractor.
- All components are manually handled and do not require heavy lifting equipment.
- Easy inspection of acoustic and fire sealing.
- Services can be easily incorporated in the wall cavities.
- If required, the stud centres can be reduced so that the system can be used in areas subject to higher-than-normal pressures.

DESIGN OPTIONS

IntRwall systems are available in several configurations with FRRs up to –/120/120 and acoustic ratings up to STC 55-69.

Various IntRwall configurations represent different options in regard to the types and fixing of outer linings to suit fire-rating and services cavity requirements.

MATERIALS

The following materials are used in USG Boral IntRwall systems.

PLASTERBOARD

- 25mm Shaftliner plasterboard
- 13mm Firestop plasterboard
- 13mm Multistop plasterboard
- 13mm Sheetrock plasterboard
- 13mm Soundstop plasterboard
- 13mm Fiberock Aqua-Tough

RONDO STEEL COMPONENTS

- 50mm I-stud
- 25mm H-stud
- 64mm C-stud
- 51mm deflection head track
- 35 x 35 x 0.75mm angle
- 237 fixing clip

INSULATION

- 30mm, 75mm and 90mm partition 11kg/m3 glasswool insulation
- 75mm and 90mm polyester insulation 14kg/m^3 density

SEALANTS AND PACKERS

- H.B. Fuller Firesound sealant
- IBS intumescent rod by Promat

FASTENERS

Refer to the IntRwall manual for fasteners used in installation of the system.

DESIGN CONSIDERATIONS

FIRE-RATING

- Penetrations in single-layer Shaftliner systems are not permitted.
- Services penetrations in non-fire resistant outer linings do not need to be fire-rated.

STRUCTURAL

The IntRwall system has been tested in the USG Boral NATA-accredited laboratory in Port Melbourne and satisfies the requirements to a maximum height of 3.0m. For greater wall heights, contact USG Boral.

NOTE:
In high-rise apartment construction, confirmation of internal design pressures should be obtained from the project Structural Engineer, especially where there are large openings such as sliding glass doors onto balconies. Consult USG Boral for stud sizes, heights and spacing for design pressures other than those specified above.

ACOUSTICS

All IntRwall systems outlined in this manual are covered by acoustical opinion RT&A TE405-20S05 from acoustic consultants Renzo Tonin & Assoc.

WET AREAS

Wet areas must be waterproofed as per the wet area details contained in USG Boral Plasterboard or Wet Area Installation Manuals NZ.

IntRwall systems extending into wet areas must incorporate water resistant linings.

LIMITATIONS

Penetrations in Shaftliner panels are not permitted unless the system is tested. Contact USG Boral for further information.

INSTALLATION

The IntRwall systems must be installed strictly in accordance with USG Boral installation specifications in order to achieve designed fire and acoustic ratings. Refer to the IntRwall manual for installation specifications and details.

INTRWALL

IW60.1

FIRE RESISTANCE RATING
NLB **-/60/60**
FROM BOTH SIDES

FRR Basis: FCO-2660, WFRA 40970, WFRA 41038, FCO-2256

Side 1:
- Non-fire resistant lining (refer to table)
- 64mm steel C-studs @ 600mm ctrs
- 20mm or 36mm gap between C-studs and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 2x25mm Shaftliner between 51mm I-studs @ 600mm ctrs

Side 2:
- Non-fire resistant lining-direct fixed to I-studs

ACOUSTIC RATINGS BASIS: RT&A TE405-20S05

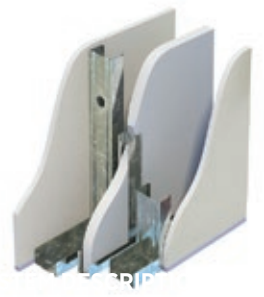
SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (GAP) mm	INSULATION*	R_w	STC
IW60.1A	1x13mm SHEETROCK	1x13mm SHEETROCK	161 (20)	75G11, 75P14 (stud cavity)	55	56
IW60.1H	1x13mm FIBEROCK	1x13mm FIBEROCK	171 (36)	90G11, 90P14 (stud cavity)	61	62
IW60.1I	1x13mm FIBEROCK	1x13mm SHEETROCK	177 (36)	90G11, 90P14 (stud cavity)	60	61

* **75/90G11** – 75/90mm partition 11kg/m³ glasswool
75/90P14 – 75/90mm polyester insulation 14kg/m³

IW60.3

FIRE RESISTANCE RATING
NLB **-/60/60**
FROM BOTH SIDES

FRR Basis: FCO-2256



Side 1:
- Non-fire resistant lining (refer to table)
- 64mm C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25mm Shaftliner between 25mm H-studs @ 600mm ctrs

Side 2:
- Non-fire resistant lining (refer to table)
- 64mm C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S05

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (GAP) mm	INSULATION*	R_w	STC
IW60.3A	1x13mm SHEETROCK	1x13mm SHEETROCK	220 (20)	75G11, 75P14 (both cavities)	55	55
IW60.3C	1x13mm SOUNDSTOP	1x13mm SOUNDSTOP	220 (20)	90G11, 90P14 (both cavities)	66	66

* **75/90G11** – 75/90mm partition 11kg/m³ glasswool
75/90P14 – 75/90mm polyester insulation 14kg/m³

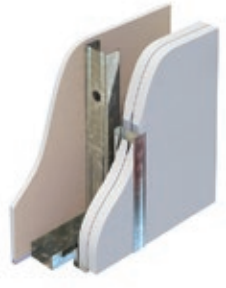
NOTES:
- IW60.3 systems are <u>not</u> to be used for corridor walls unless approved by USG Boral.
- Penetrations in Shaftliner panels are not permitted.
- Contact USG Boral for further information.

INTRWALL

IW90.2

FIRE RESISTANCE RATING
NLB **-/90/90**
FROM BOTH SIDES

FRR Basis: FCO-2660, FSV 0883, EWFA 2724-00



ACOUSTIC RATINGS BASIS: RT&A TE405-20S05

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (GAP) mm	INSULATION*	R_w	STC
IW90.2A	1x13mm FIRESTOP	Nil	150 (20)	75G11, 75P14 (stud cavity only)	57	58
IW90.2B	1x13mm MULTISTOP	Nil	150 (20)	75G11, 75P14 (stud cavity only)	58	59

* **75G11** – 75mm partition 11kg/m³ glasswool
75P14 – 75mm polyester insulation 14kg/m³

NOTES:

- Penetrations in IW90.2 systems must be fire-rated.
- Contact USG Boral for further information.

Side 1:
- 1x 13mm fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation between studs (refer to table)

Fire Barrier:
- 2x25mm Shaftliner between 51mm I-studs @ 600mm ctrs

Side 2:
- Nil linings

IW90.3

FIRE RESISTANCE RATING
NLB **-/90/90**
FROM BOTH SIDES

FRR Basis: FCO-2660, FCO-2434, EWFA 2724-00

ACOUSTIC RATINGS BASIS: RT&A TE405-20S05

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (GAP) mm	INSULATION*	R_w	STC
IW90.3A	1x13mm FIRESTOP	1x13mm FIRESTOP	160 (20)	75G11, 75P14 (stud cavity only)	59	60
IW90.3B	1x13mm MULTISTOP	1x13mm MULTISTOP	160 (20)	75G11, 75P14 (stud cavity only)	60	61
IW90.3C	1x13mm FIRESTOP	1x13mm MULTISTOP	160 (20)	75G11, 75P14 (stud cavity only)	59	60

* **75G11** – 75mm partition 11kg/m³ glasswool
75P14 – 75mm polyester insulation 14kg/m³

Side 1:
- 1x 13mm fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 2x25mm Shaftliner between 51mm I-studs @ 600mm ctrs

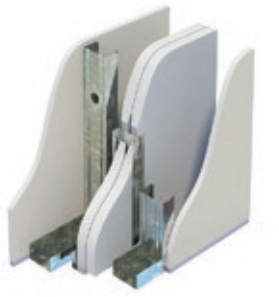
Side 2:
- 1x 13mm fire resistant pbd direct-fixed to I-studs

INTRWALL

IW90.4

FIRE RESISTANCE RATING
NLB **-/90/90**
FROM BOTH SIDES

FRR Basis: WFRA 40970, FSV 0883



Side 1:
- Non-fire resistant lining (refer to table)
- 64mm steel C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 2x25mm Shaftliner between 51mm I-studs @ 600mm ctrs

Side 2:
- Non-fire resistant lining (refer to table)
- 64mm C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S05

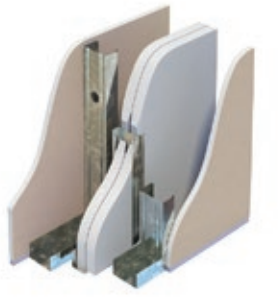
SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (GAP) mm	INSULATION*	R_W	STC
IW90.4A	1x13mm SHEETROCK	1x13mm SHEETROCK	245 (20)	75G11, 75P14 (both cavities)	58	58
IW90.4C	1x13mm SOUNDSTOP[1]	1x13mm SOUNDSTOP	245 (20)	75G11, 75P14 (both cavities)	69	69

* **75G11** – 75mm partition 11kg/m³ glasswool
75P14 – 75mm polyester insulation 14kg/m³

IW120.1

FIRE RESISTANCE RATING
NLB **-/120/120**
FROM BOTH SIDES

FRR Basis: FCO-2434, EWFA 2724-00



Side 1:
- 1x13mm fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 2x25mm Shaftliner between 51mm I-studs @ 600mm ctrs

Side 2:
- 1x13mm fire resistant pbd
- 64mm C-studs @ 600mm ctrs
- 20mm gap between C-studs and fire barrier
- Insulation (refer to table)

ACOUSTIC RATINGS BASIS: RT&A TE405-20S05

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (GAP) mm	INSULATION*	R_W	STC
IW120.1A	1x13mm FIRESTOP	1x13mm FIRESTOP	245 (20)	75G11, 75P14 (both cavities)	67	67
IW120.1B	1x13mm MULTISTOP	1x13mm MULTISTOP	245 (20)	75G11, 75P14 (both cavities)	69	69
IW120.1C	1x13mm FIRESTOP	1x13mm MULTISTOP	245 (20)	75G11, 75P14 (both cavities)	68	68

* **75G11** – 75mm partition 11kg/m³ glasswool
75P14 – 75mm polyester insulation 14kg/m³

NOTES:
- Penetrations in IW120.1 systems must be fire-rated.
- Contact USG Boral for further information.

SPECIALTY SYSTEMS

Introduction
Lift & Services Shafts
Shaftwall
Column Protection
Beam Protection
Fire Tunnels

INTRODUCTION

The following USG Boral Specialty Systems are outlined in this manual:

- Lift and Services Shafts
- Shaftwall™
- Column and Beam Protection
- Fire Tunnel™

LIFT AND SERVICES SHAFTS

NZBC REQUIREMENTS

FIRE-RATING

Refer to the NZBC for fire-rating requirements for lift and services shafts in buildings.

ACOUSTICS

The NZBC requirement for a wall between a lift shaft and a sole-occupancy unit in buildings is STC=55 minimum.

STRUCTURAL

Refer to the NZBC for structural requirements for lift and services shafts.

» INTRODUCTION

SHAFTWALL™

DESCRIPTION

Shaftwall systems utilise 25mm Shaftliner plasterboard friction fitted between Rondo CH-Studs, and Firestop plasterboard screw-fixed on one or both sides of the wall.

Most Shaftwall systems outlined in this manual can be fully constructed from one side and can be used for enclosure of lift and services shafts.

Figure 34: **Shaftwall**

DESIGN OPTIONS

Shaftwall systems are available with various configurations of Firestop linings achieving FRRs up to -/120/120 from both sides and acoustic ratings up to STC = 53 or R_w = 52.

A number of stud sizes and thicknesses are available, allowing construction of some Shaftwall systems up to 4.8m (refer to Shaftwall Maximum Wall Heights table, page 133).

MATERIALS

Plasterboard Linings

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

Steel Sections

The following Rondo steel sections are utilised in Shaftwall systems.

TABLE 18: **RONDO SHAFTWALL COMPONENTS**

SECTION TYPE & SIZE	SECTION SIZE	BMT
CH-stud	64mm and 102mm	0.55mm and 0.90mm
E-stud	64mm and 102mm	0.55mm and 0.90mm
J-track	64mm and 102mm	0.80mm
Deflection track	64mm and 102mm	0.80mm

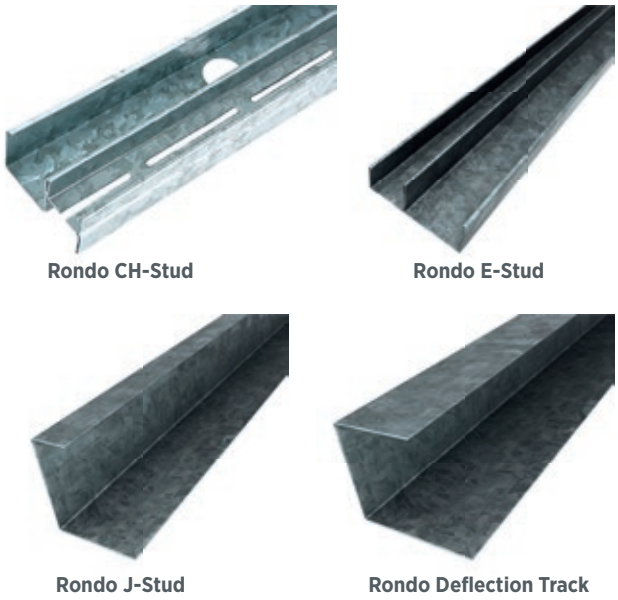


Figure 35: **Rondo Shaftwall Components**

Insulation

- 50mm partition 11kg/m^3 glasswool 50mm polyester insulation 14kg/m^3 density

Screws

- Refer to General Information — Fasteners Tables 2-4 for plasterboard screw types

Caulking

- H.B. Fuller Firesound sealant

DESIGN CONSIDERATIONS

- Refer to the NZBC for performance requirements for lift and services shafts

» INTRODUCTION

NOTES TO SHAFTWALL HEIGHT TABLES

- Symbols:

  d = deflection limits

  h = head track capacity limits
- Minimum yield stress of steel sections to be 270MPa.
- Deflection limit is height/240 to a maximum of 20mm for CH-studs.
- Wall heights tabled are for single-length studs at maximum centres shown.
- The tabulated heights need to be checked against head track reaction capacity in Tables 19 or 20.
- Wall heights tabled are not for axial loads but include self-weight and lateral pressures stated.
- Wall heights tabled are not applicable to steel-lipped C-studs.
- The maximum height tables do not allow for shelf loading. Contact Rondo for advice if shelf loading is required.
- Tabulated heights are for internal walls only. Refer to Rondo if walls are subjected to external loadings.
- All plasterboard is to be manufactured by USG Boral.
- Walls are to be constructed with Firestop plasterboard to USG Boral standard Shaftwall fire-rated wall details, as appropriate.
- For fire service, 50Pa pressure is assumed. Where pressures are >50Pa and fire loadings are likely to be combined with other loads, USG Boral should be consulted.
- Detailed seismic analysis requires site/building-specific parameters and has not been performed for these notes. However, tabulated wall heights are based on the following assumptions:
  - walls that have been designed for 0.25kPa and 0.35kPa pressure. Higher values will require specific engineering design (SED)
  - walls, including attachments, that have a total mass (Gc) not exceeding 100kg/m^2
  - acceleration a $\leq$ 0.08
  - Site Factor S $\leq$ 2.0
  - ax $\leq$ 2.0
  - ac $\leq$ 1.0
  - Cc1 $\leq$ 0.9
  - I = 1.0.

HEAD TRACK REACTION CAPACITIES

Tabulated maximum heights for Shaftwall systems are based on the following head track reaction capacities for 50mm x 0.80mm BMT head runner flange and 20mm max clearance at top of stud.

TABLE 19: **HEAD TRACK REACTION CAPACITIES**

STUD	HEAD TRACK REACTION CAPACITY kN
64CH55, 102CH55	0.28
64CH90, 102CH90	0.44

Contact Rondo if reactions and/or required clearance at the top of the stud exceed the above.

The following head track reaction capacities can be used for 0.80mm BMT standard J runner at head and base and 10mm max clearance at top of stud.

TABLE 20: **HEAD TRACK REACTION CAPACITIES**

STUD	HEAD TRACK REACTION CAPACITY kN
64CH55, 102CH55	0.40
64CH90, 102CH90	0.75

The head track reaction capacities listed above in Tables 19 and 20 rely on the plasterboard for restraint.

Head track installation must be strictly in accordance with USG Boral and Rondo details. Contact USG Boral or Rondo for alternative head track installations.

LIFT & SERVICES SHAFTS – SHAFTWALL

SH

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–1556, FCO–1828, FCO–1503, SI 1017, FCO–1659, FR 1429

Side 1: 1x25mm Shaftliner pbd (+ 1x16mm Firestop pbd for SH120.4A)
Framing: Steel CH-studs (refer to table)
Insulation: Refer to table
Side 2: One or more layers of fire resistant pbd

ACOUSTIC RATINGS BASIS: RT&A TE405-20S10

SYSTEM	FRR	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	INSULATION* STUD SIZE mm	NIL R_w	NIL STC	50G11, 50P14 R_w	50G11, 50P14 STC
SH60.1A	–/60/60 from both sides	1x25mm SHAFTLINER	1x16mm FIRESTOP	80	64CH55	39	40	47	48
					64CH90	36	37	44	45
				118	102CH55	41	42	48	49
					102CH90	38	39	45	46
SH120.1A	–/120/90 from occupancy side –/120/120 from shaft side	1x25mm SHAFTLINER	2x13mm FIRESTOP	90	64CH55	42	43	50	51
					64CH90	39	40	47	48
				128	102CH55	44	45	50	51
					102CH90	41	42	47	48
SH120.2A	–/120/120 from both sides	1x25mm SHAFTLINER	1x16mm FIRESTOP + 1x13mm FIRESTOP	93	64CH55	42	43	50	51
					64CH90	39	40	47	48
				131	102CH55	44	45	51	52
					102CH90	41	42	48	49
SH120.3A	–/120/120 from both sides	1x25mm SHAFTLINER	2x16mm FIRESTOP	96	64CH55	43	45	50	52
					64CH90	40	42	47	49
				134	102CH55	45	47	51	53
					102CH90	42	44	48	50
SH120.4A	–/120/120 from both sides	1x25mm SHAFTLINER + 1x16mm FIRESTOP	1x16mm FIRESTOP	96	64CH55	42	43	51	52
					64CH90	39	40	48	49
				134	102CH55	45	46	52	53
					102CH90	42	43	49	50

* **50G11** – 50mm partition 11kg/m³ glasswool **50P14** – 50mm polyester insulation 14kg/m³

MAX WALL HEIGHTS mm

SYSTEM	STUD SIZE mm	BMT mm	PRESSURE kPa 0.25	PRESSURE kPa 0.35
SH60.1A SH120.1A SH120.2A SH120.4A	64	0.55	2950 d[1]	2640 d
		0.90	3460 d	3090 d
	102	0.55	3730 h[2]	2660 h
		0.90	4980 d	4190 h
SH120.3A	64	0.55	3730 h	2660 h
		0.90	4380 d	3890 d
	102	0.55	3730 h	2660 h
		0.90	5510 d	4190 h

Height Limiting Factor
[1] **d** = deflection (L/240 ≤ 20mm)
[2] **h** = head track capacity

» INTRODUCTION

COLUMN AND BEAM PROTECTION

DESCRIPTION

USG Boral Column and Beam Protection systems utilise fire resistant plasterboard for fire protection of various types of columns and beams.

Fire protection systems are available for the following types of columns and beams:

- free-standing concrete columns
- free-standing I-section, CHS and SHS steel columns
- steel columns within a fire-rated wall
- free-standing timber columns
- steel beams under concrete floor
- timber beams under fire-rated floor.

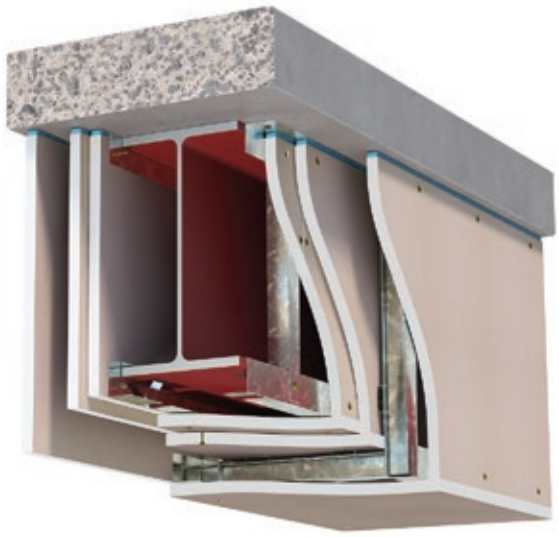


Figure 36: **Beam Protection System PSB120.1D**

DESIGN OPTIONS

Steel column protection systems are available with FRRs up to 180/–/–.

Concrete and timber column protection systems are available with FRRs up to 120/–/–.

Steel and timber beam protection systems are available with FRRs up to 120/–/–.

MATERIALS

Plasterboard Linings

- 25mm Shaftliner plasterboard
- 13mm Firestop plasterboard
- 16mm Firestop plasterboard
- 10mm Multistop 4 plasterboard

Steel Section Profiles

Refer to the system tables following

Screws

Refer to the General Information — Fasteners Tables 2-4

Sealants and Packers

H.B. Fuller Firesound® sealant

DESIGN CONSIDERATIONS

- Refer to the NZBC for fire-rating requirements for LB columns and beams.
- LB columns and beams are to be designed in accordance with the NZBC and the relevant Standards.

COLUMN PROTECTION

PSC.1

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–1972

One or more layers of fire resistant pbd around periphery on encasement channel forming gap around column

COLUMN PROTECTION – STEEL I–SECTIONS

SYSTEM	FRR	LINING (All sides)	FIXING
PSC30.1A	30/–/–	1x13mm FIRESTOP	Around periphery, spaced from column
PSC60.1A	60/–/–	2x13mm FIRESTOP or 1x25mm SHAFTLINER	Around periphery, spaced from column
PSC90.1A	90/–/–	2x16mm FIRESTOP	Around periphery, spaced from column
PSC120.1A	120/–/–	3x13mm FIRESTOP or 1x13mm FIRESTOP + 1x25mm SHAFTLINER	Around periphery, spaced from column

PSC.2

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–1972

One or more layers of fire resistant pbd around periphery on Rondo 142 track forming min 18mm gap around column

COLUMN PROTECTION – STEEL SHS/RHS SECTIONS

SYSTEM	FRR	LINING (All sides)	FIXING
PSC30.2A	30/–/–	1x13mm FIRESTOP	Around periphery, spaced from column
PSC60.2A	60/–/–	2x13mm FIRESTOP or 1x25mm Shaftliner	Around periphery, spaced from column
PSC90.2A	90/–/–	2x16mm FIRESTOP	Around periphery, spaced from column
PSC120.2A	120/–/–	3x13mm FIRESTOP or 1x13mm FIRESTOP + 1x25mm SHAFTLINER	Around periphery, spaced from column

PSC.3

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–1972

One or more layers of fire resistant pbd around periphery on Rondo 0.75mm BMT track forming gap around column

COLUMN PROTECTION – STEEL CHS SECTIONS

SYSTEM	FRR	LINING (All sides)	FIXING
PSC30.3A	30/–/–	1x13mm FIRESTOP	Around periphery, spaced from column
PSC60.3A	60/–/–	2x13mm FIRESTOP or 1x25mm SHAFTLINER	Around periphery, spaced from column
PSC90.3A	90/–/–	2x16mm FIRESTOP	Around periphery, spaced from column
PSC120.3A	120/–/–	3x13mm FIRESTOP or 1x13mm FIRESTOP + 1x25mm SHAFTLINER	Around periphery, spaced from column

COLUMN PROTECTION

PSC.4

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–1972

One or more layers of fire resistant pbd direct-fixed to studs forming min 10mm gap from column

COLUMN PROTECTION – STEEL COLUMNS WITHIN WALL

SYSTEM	FRR	LINING (Both sides)	FIXING
PSC30.4A	30/–/–	1x13mm FIRESTOP	Direct to stud
PSC60.4A	60/–/–	2x13mm FIRESTOP	Direct to stud
PSC90.4A	90/–/–	2x16mm FIRESTOP	Direct to stud
PSC120.4A	120/–/–	3x13mm FIRESTOP	Direct to stud

PSC.5

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–1972, BHP980804, BHP980216, BHP940810, BHP950915

One or more layers of 25mm Shaftliner pbd direct-fixed around periphery with corner angles and wire ties
1x10mm Multistop pbd direct-fixed over Shaftliner pbd (PSC120.5AA only)

COLUMN PROTECTION – STEEL I-SECTIONS

SYSTEM	FRR	LINING (All sides)	FIXING
PSC120.5AA	120/–/–	1x25mm SHAFTLINER + 1x10mm MULTISTOP	Direct to column of ESA/M<9.45m²/t*
PSC120.5B	120/–/–	2x25mm SHAFTLINER	Direct to column of ESA/M<45m²/t*
PSC180.5A	180/–/–	3x25mm SHAFTLINER	Direct to column of ESA/M<45m²/t*

* ESA/M – Ratio of Exposed Surface Area (m²) to Mass (t) per metre length

COLUMN PROTECTION

PCC.1

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–2074

1x fire resistant pbd furred

COLUMN PROTECTION – CONCRETE COLUMNS

SYSTEM	FRR INCREASE	LINING (All sides)	FIXING
PCC30.1A	30/–/–	1x13mm FIRESTOP	Furred
PCC120.1A	120/–/–	1x25mm SHAFTLINER	Furred

PTC.1

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: 91/183, 91/169

One or more layers of fire resistant pbd direct-fixed or furred (refer to table)

COLUMN PROTECTION – TIMBER COLUMNS

SYSTEM	FRR INCREASE	LINING (All sides)	FIXING
PTC30.1A	30/–/–	1x13mm FIRESTOP	Direct or furred
PTC60.1A	60/–/–	2x13mm FIRESTOP	Direct or furred
PTC90.1A	90/–/–	3x13mm FIRESTOP	Direct or furred
PTC120.1A	120/–/–	3x16mm FIRESTOP	Direct or furred

BEAM PROTECTION

PSB.1

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–1972, FCO–0410, FSU–0115, BHP930630

Lining: Refer to table

BEAM PROTECTION – STEEL BEAMS

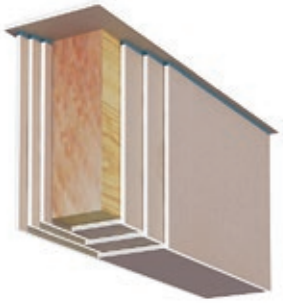
SYSTEM	FRR INCREASE	LINING (All sides)	FIXING
PSB30.1A	30/–/–	1x16mm FIRESTOP	Over SHAFTLINER packers to sides and bottom of steel beam of ESA/M < 30m²/t*
PSB120.1A	120/–/–	3x13mm FIRESTOP or 1x25mm SHAFTLINER + 1x13mm FIRESTOP	Spaced from sides and bottom of steel beam
PSB120.1B	120/–/–	2x25mm SHAFTLINER	RHS steel beam supporting horizontal Shaft Wall
PSB120.1C	120/–/–	3x16mm FIRESTOP	PFC steel beam within wall clad both sides
PSB120.1D	120/–/–	Furring + 2x16mm FIRESTOP + Furring + 1x16mm FIRESTOP	Spaced from sides and bottom of steel beam supporting concrete floor
PSB120.1E	120/–/–	Ceiling bulkhead or furring + 2x16mm FIRESTOP + Furring + 1x16mm FIRESTOP	Spaced from sides and bottom of steel beam supporting timber floor

* ESA/M – Ratio of Exposed Surface Area (m²) to Mass (t) per metre length

PTB.1

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: 93/402



Lining: One or more layers of fire resistant pbd direct-fixed

BEAM PROTECTION – TIMBER BEAMS

SYSTEM	FRR INCREASE	LINING (All sides)	FIXING
PTB30.1A	30/–/–	1x13mm FIRESTOP	Direct
PTB60.1A	60/–/–	2x13mm FIRESTOP	Direct
PTB90.1A	90/–/–	3x13mm FIRESTOP	Direct
PTB120.1A	120/–/–	3x16mm FIRESTOP	Direct

» INTRODUCTION

FIRE TUNNEL™

DESCRIPTION

USG Boral Fire Tunnel provides a lightweight solution for fire-isolated passageways, as outlined in the NZBC.

Fire Tunnel is a self-supported steel-framed system constructed using Rondo 150mm stud and track and lined with USG Boral Firestop plasterboard inside and outside.

Figure 37: **Fire Tunnel**

DESIGN OPTIONS

USG Boral Fire Tunnels are available with FRRs up to –/120/120 from both sides or –/180/180 from the outside only.

Fire Tunnels can be constructed without structural design calculations to an internal width of 2000mm and an internal height of 2200mm. SED will be required for larger Fire Tunnels.

MATERIALS

Plasterboard

- 25mm Shaftliner plasterboard
- 13mm Firestop plasterboard
- 16mm Firestop plasterboard
- 10mm Multistop 4 plasterboard

Steel Sections

- Rondo 150mm C-stud 0.75mm BMT
- Rondo 150mm track 0.75mm BMT
- Rondo 75mm x 75mm steel angle 0.75mm BMT

Fasteners

- 10g x 16mm drill point wafer head screws
- Ø3.2 x 6mm dia all steel pop rivets
- 6g x 32mm, 8g x 60m needle point screws

DESIGN CONSIDERATIONS

- Refer to the NZBC for fire-rating requirements for fire isolated passageways.
- Fire Tunnel systems are designed to support their own weight only. The Fire Tunnel roof is not trafficable and must not be used for storage of materials or equipment.

INSTALLATION

- Refer to the Steel Stud Wall section for general installation instructions for fire-rated steel stud walls.
- Refer to the Junctions and Penetrations sections for fire-rated steel stud wall construction details.

FIRE TUNNEL

FT

FIRE RESISTANCE RATING
(refer to table)

FRR Basis: FCO–0645R, FCO–0411R, FCO–1160, FCO–1161, FCO–1162, FCO–1213

One or more layers of fire resistant pbd direct-fixed to both sides of steel-framed walls and ceiling

FIRE TUNNELS

SYSTEM	FRR	FRAME	LINING
FT60.1A	–/60/60 from outside	Welded steel frame 150mm Rondo studs, track and corner angles	1x16mm FIRESTOP over and under ceiling 1x16mm FIRESTOP to both sides of wall frame
FT60.2A	–/60/60 from both sides	Welded steel frame 150mm Rondo studs, track and corner angles	2x16mm FIRESTOP over and under ceiling 1x16mm FIRESTOP to both sides of wall frame
FT90.1A	–/90/90 from outside	Welded steel frame 150mm Rondo studs, track and corner angles	2x13mm FIRESTOP over ceiling and outside walls 1x13mm FIRESTOP under ceiling and inner walls
FT120.1AA	–/120/120 from outside	Welded steel frame 150mm Rondo studs, track and corner angles	2x16mm FIRESTOP over ceiling and outside walls 1x16mm FIRESTOP + 1x10mm MULTISTOP under ceiling and inner walls
FT120.2A	–/120/120 from both sides	Welded steel frame 150mm Rondo studs, track and corner angles	2x16mm FIRESTOP over ceiling 3x16mm FIRESTOP under ceiling 2x16mm FIRESTOP to both sides of wall frame
FT180.1A	–/180/180 from outside	Structural support steel frames	2x25mm SHAFTLINER over ceiling 1x16mm FIRESTOP under ceiling 2x16mm FIRESTOP to both sides of NLB wall frame

JUNCTIONS & PENETRATIONS

Fire-rated Steel Stud Walls
Smoke and Acoustic Steel Stud Walls
Fire-rated Timber Stud Walls
Fire-rated Ceilings
Non-fire-rated Ceilings

SYSTEMS + INNOVATIVE SYSTEMS SOLUTIONS

FIRE-RATED STEEL STUD WALLS

TERMINALS, JUNCTIONS AND CONTROL JOINTS

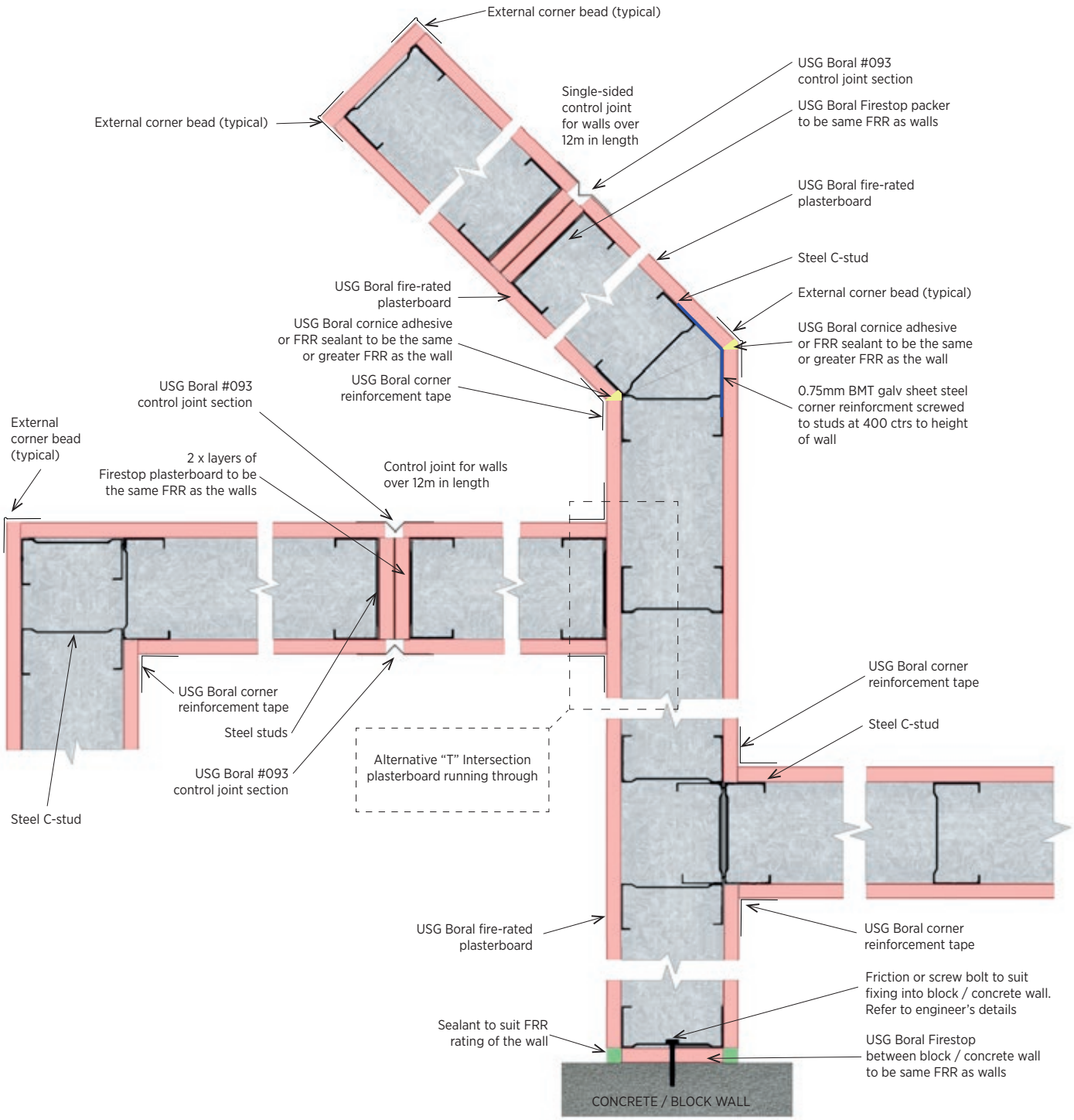


Figure 38: **Single Stud Terminal Control Joint and Junction Details 1x Layer Fire-rated Plasterboard (Twin Stud, Staggered Stud layout similar)**

NOTES:

- Control joints must coincide with those occurring in the main building structure and/or at maximum 12m centres.
- Location of control joints should be verified with a structural engineer.
- For screws, refer to General Information – Fasteners, Tables 2-4.

» FIRE-RATED STEEL STUD WALLS

TERMINALS, JUNCTIONS AND CONTROL JOINTS

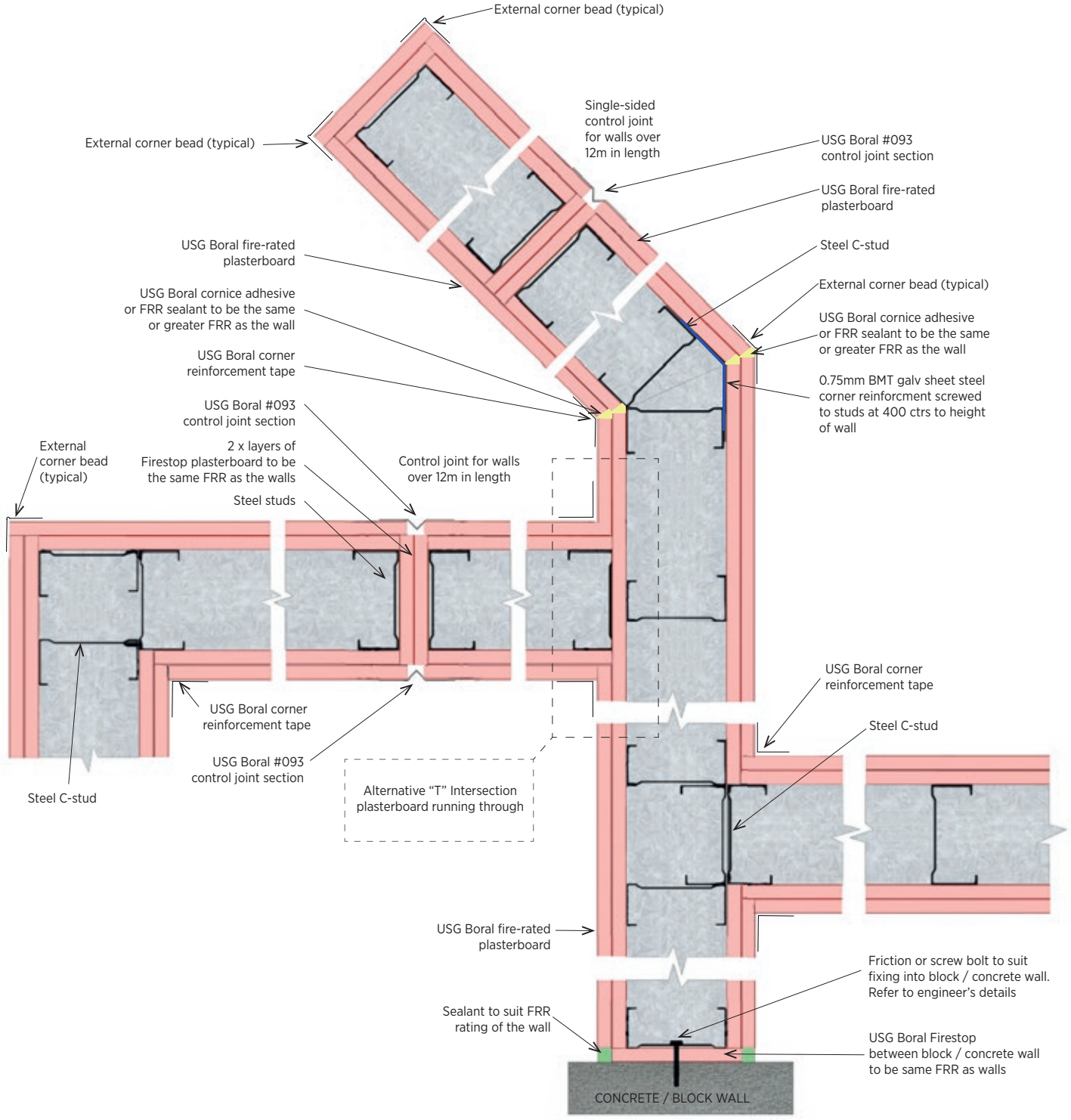


Figure 39: **Single Stud Terminal Control Joint and Junctions Details 2x layers Fire-rated Plasterboard (Twin Stud & Staggered Stud layout similar)**

» FIRE-RATED STEEL STUD WALLS

TERMINALS AND JUNCTIONS

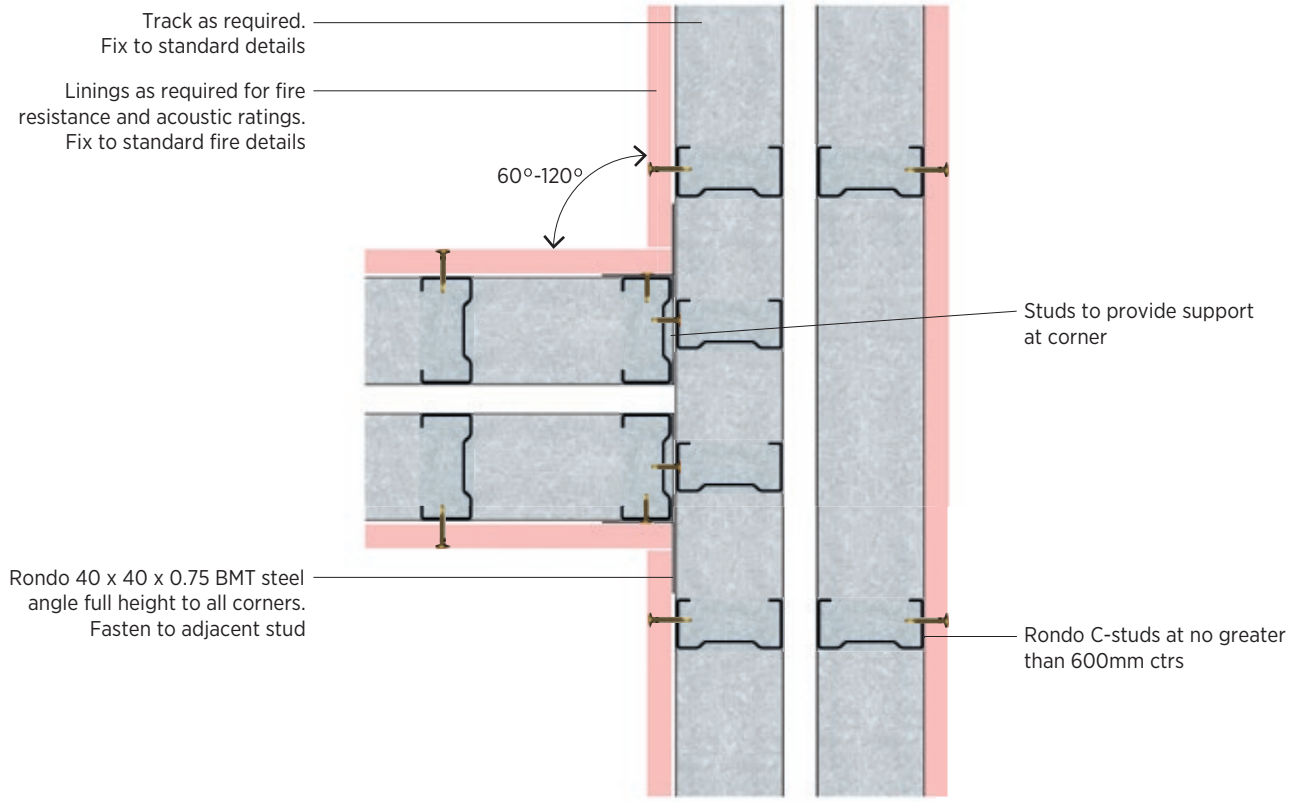


Figure 40: **Twin Steel Stud T-Junction Detail**

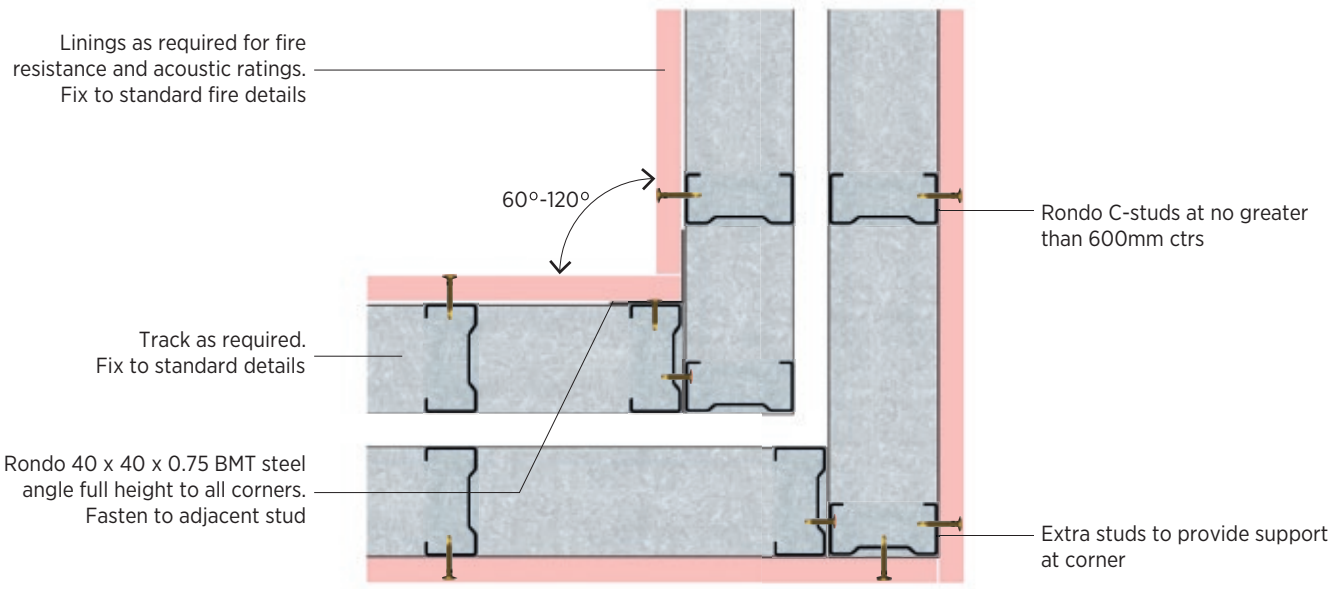


Figure 41: **Twin Steel Stud Corner Detail**

» FIRE-RATED STEEL STUD WALLS

TERMINALS AND JUNCTIONS

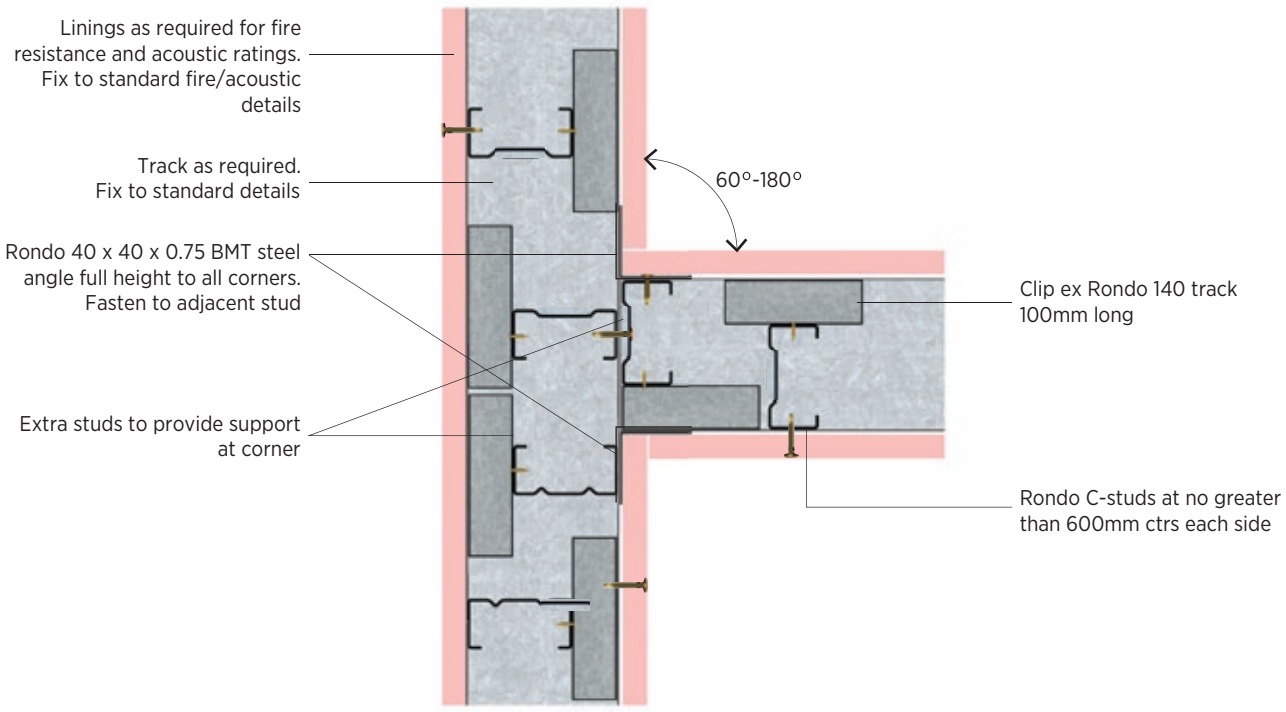


Figure 42: **Staggered Steel Stud T-Junction Detail**

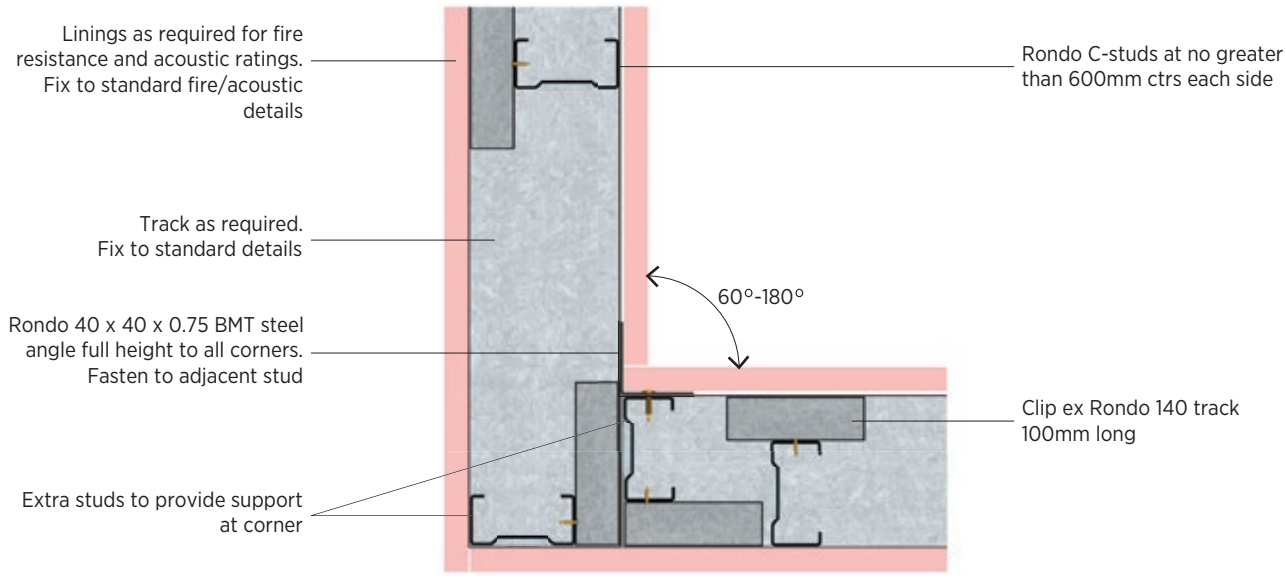


Figure 43: **Staggered Steel Stud Corner Detail**

» FIRE-RATED STEEL STUD WALLS (NON-LOAD BEARING)

BASE DETAILS

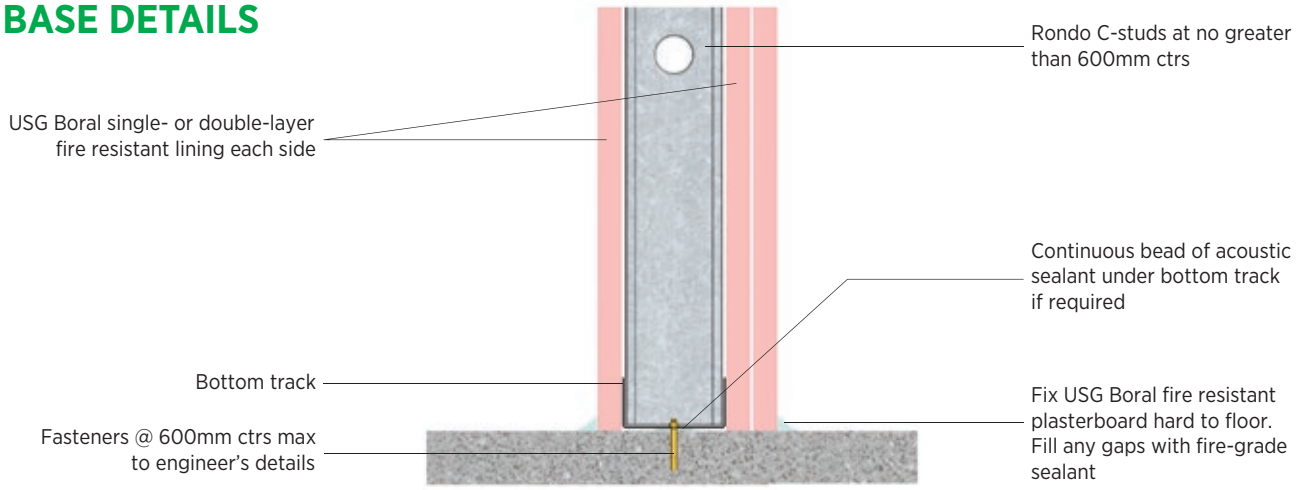


Figure 44: **Partition Base Detail**

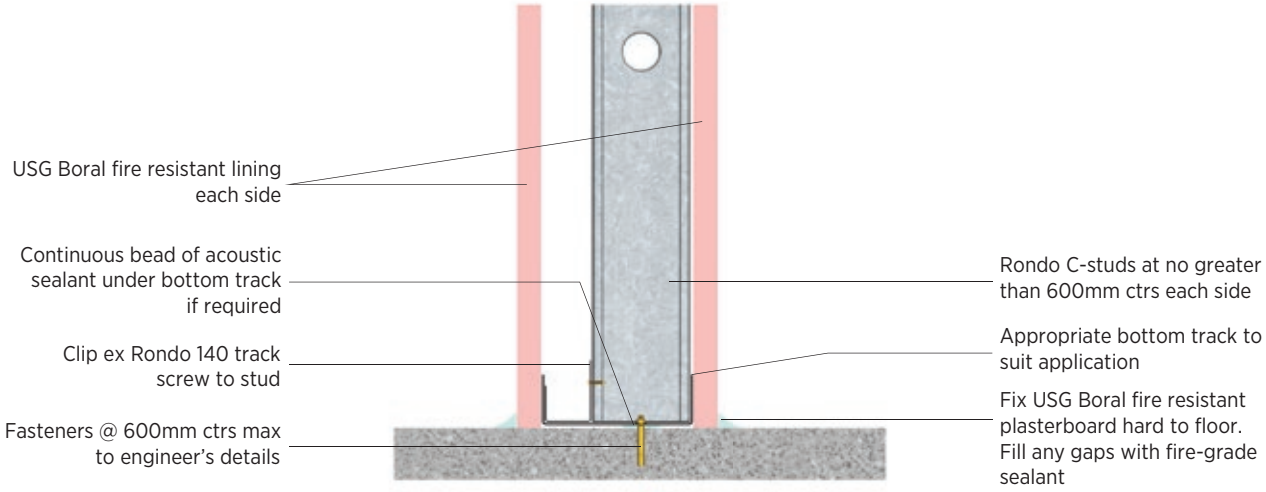


Figure 45: **Staggered Stud Base Detail**

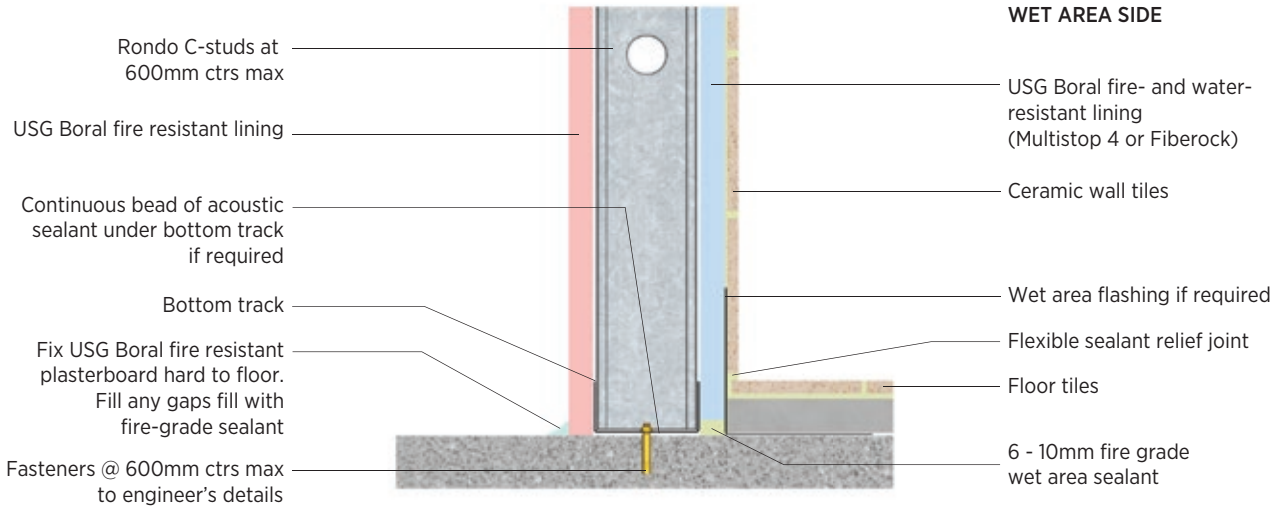


Figure 46: **Partition Wet Area Base Detail**

» FIRE-RATED STEEL STUD WALLS (NON-LOAD BEARING)

HEAD DETAILS

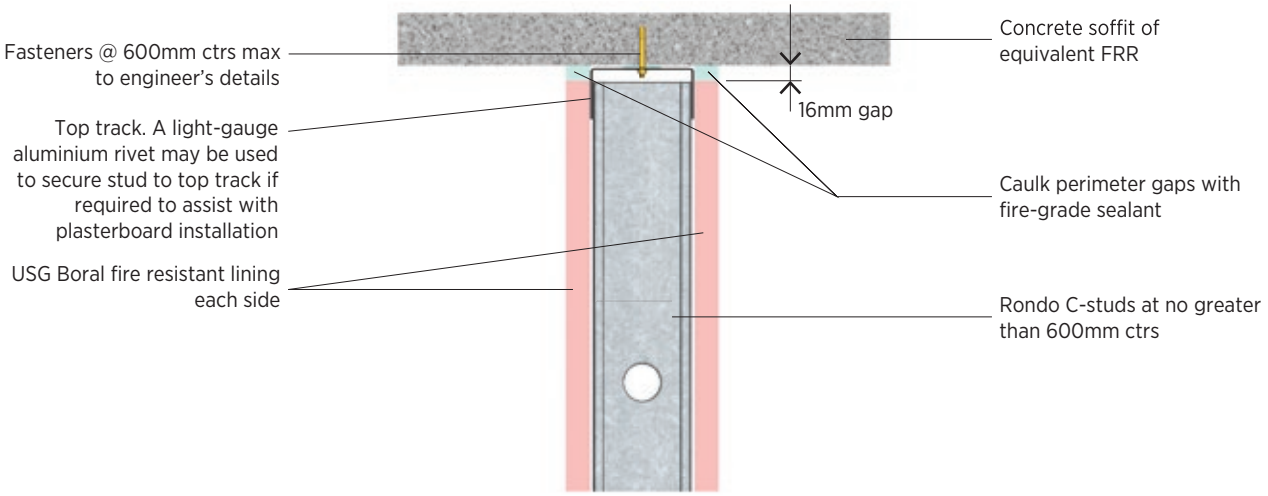


Figure 47: **Partition Head Detail**

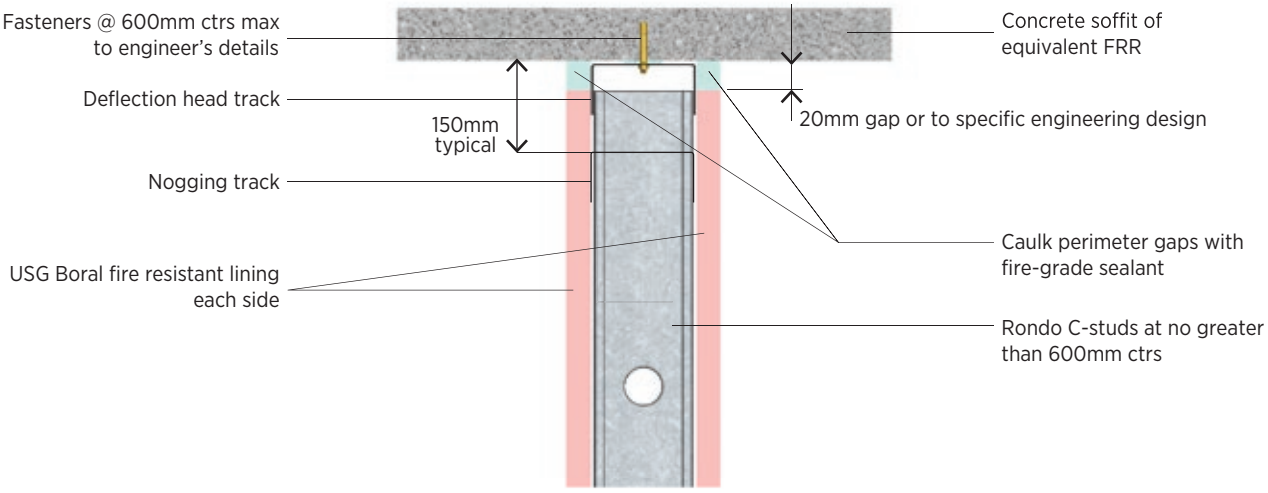


Figure 48: **Deflection Head Detail**

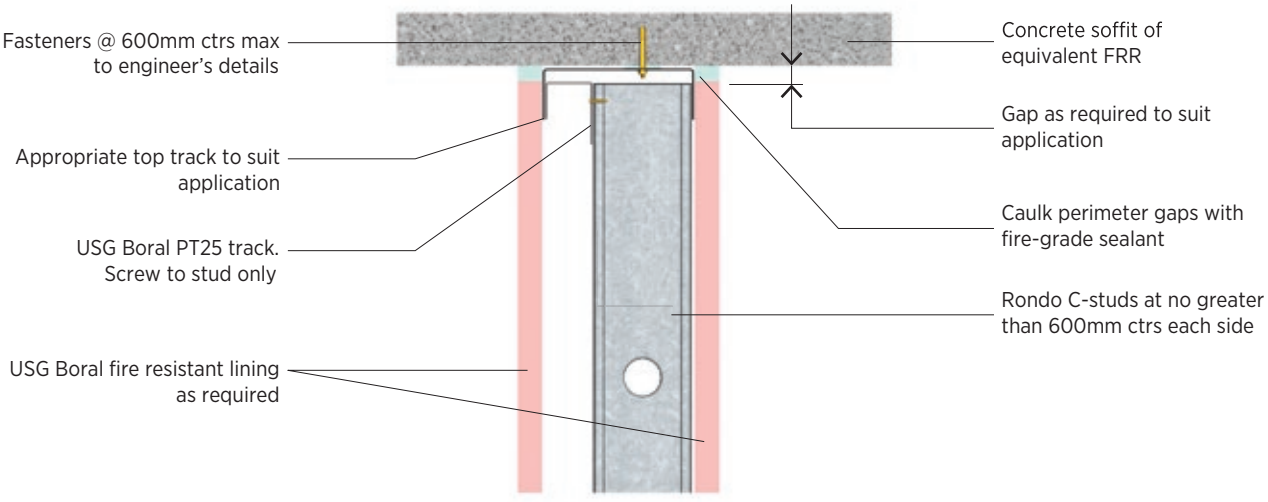


Figure 49: **Staggered Stud Head Detail**

» FIRE-RATED STEEL STUD WALLS

COMPOSITE FLOOR DEFLECTION HEAD DETAILS

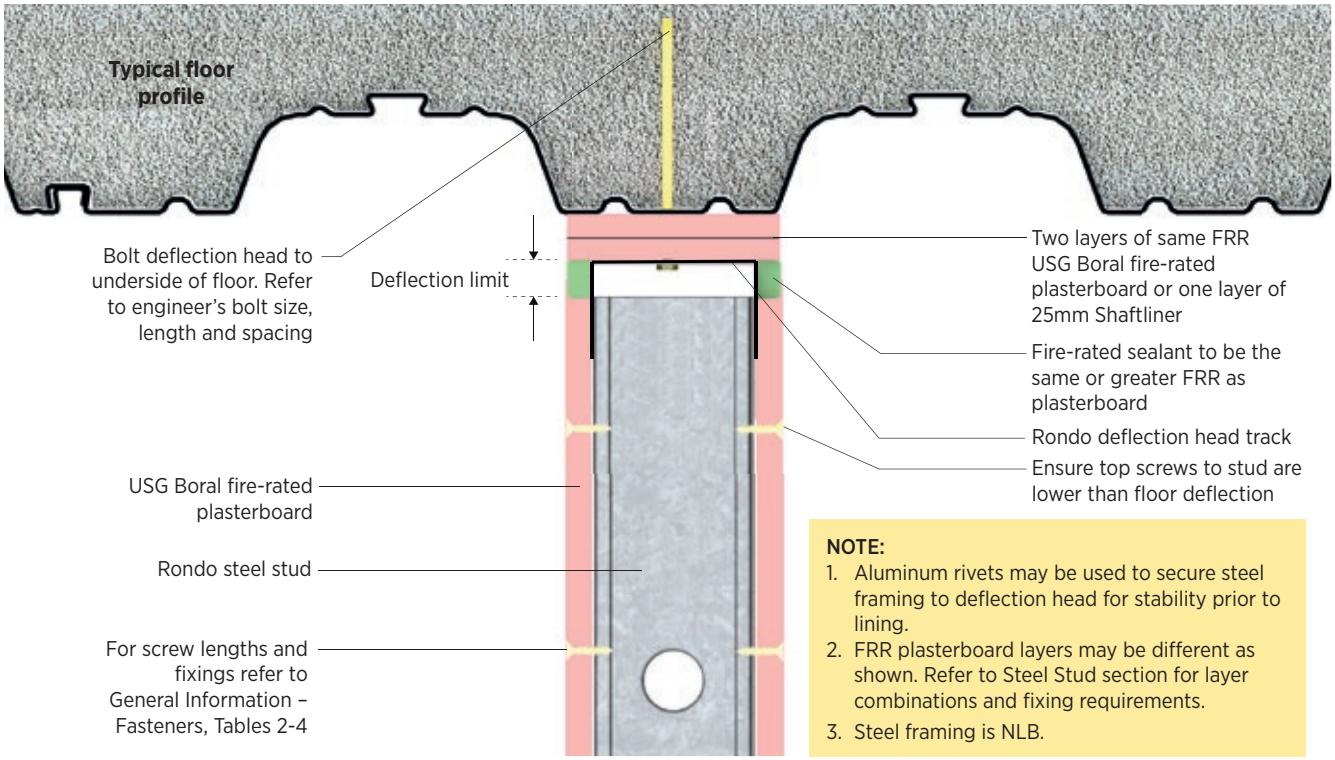


Figure 50: **Steel Stud Wall Parallel to Rib Profile – Directly Under Rib**

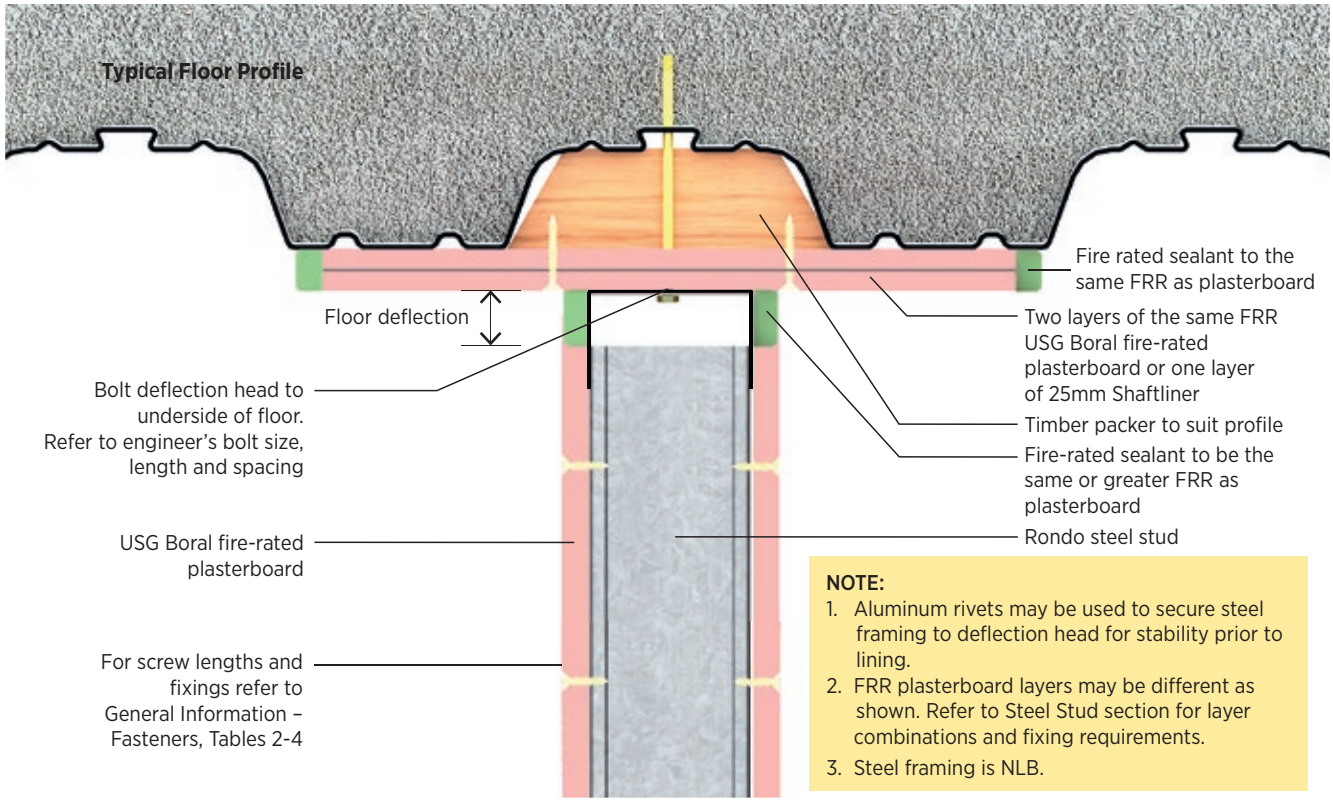


Figure 51: **Steel Stud Wall Parallel to Rib Profile – Timber Blocking**

» FIRE-RATED STEEL STUD WALLS

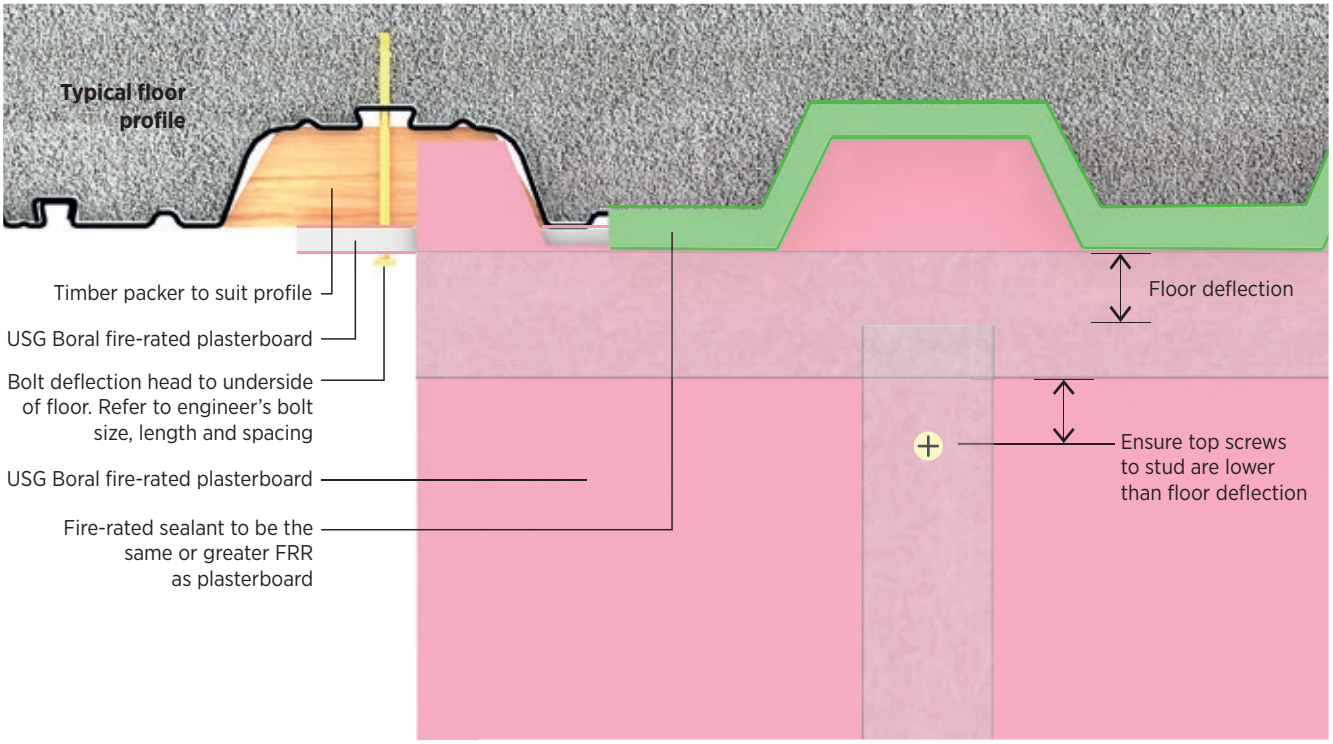


Figure 52: **Steel Stud Wall Perpendicular to Rib Profile**

MAXIMUM PLASTERBOARD LOADING ON COMPOSITE FLOORS#		
THICKNESS (mm)	MAXIMUM NUMBER OF SHEETS PER PALLET*	
	Sheetrock	Multistop 4, Fiberock or Firestop
10	70	45
13	60	35
16	NA	30

28 day strength, 5kPa limit (Confirm with the composite floor manufacturer)
* Includes 0.4kPa allowance for pallet & packaging loads

Figure 53: **Maximum Number of Sheets per Pallet**

» FIRE-RATED STEEL STUD WALLS (NON-LOAD BEARING)

HEAD DETAILS

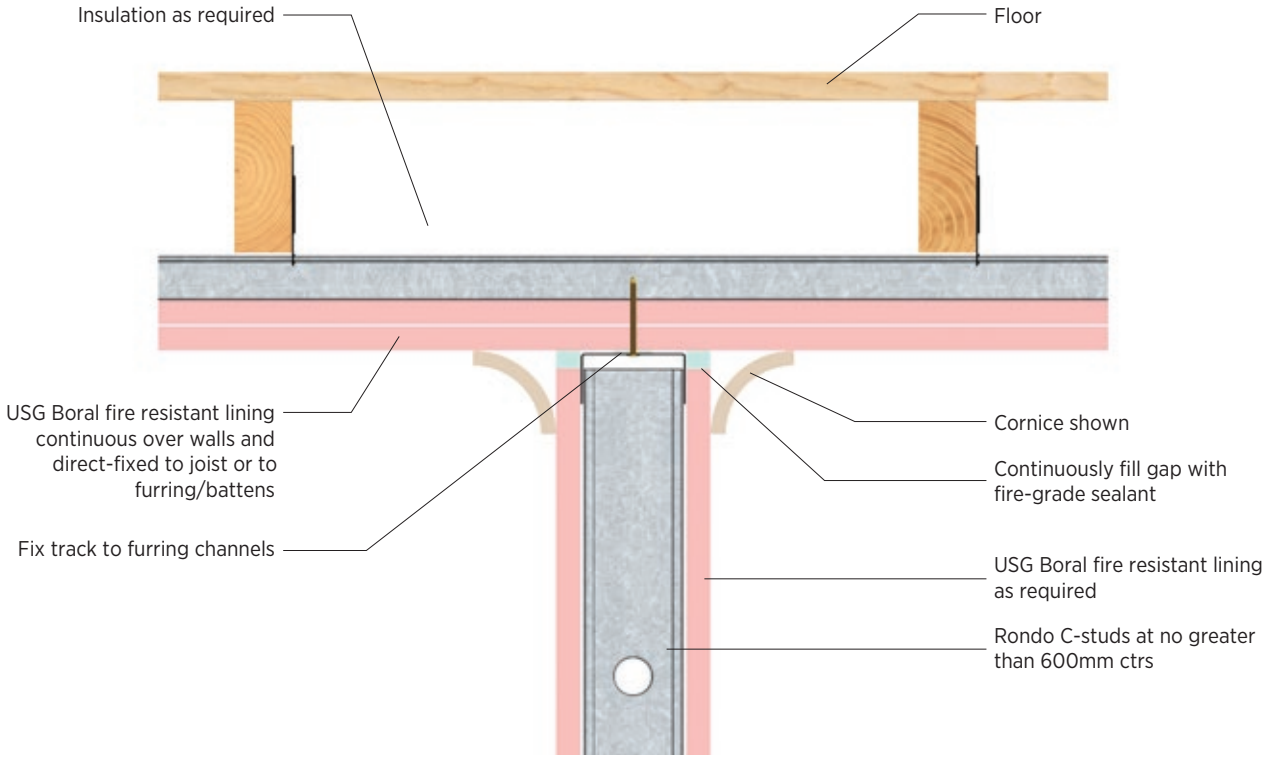


Figure 54: **Fire-rated Wall to Fire-rated Ceiling Detail**

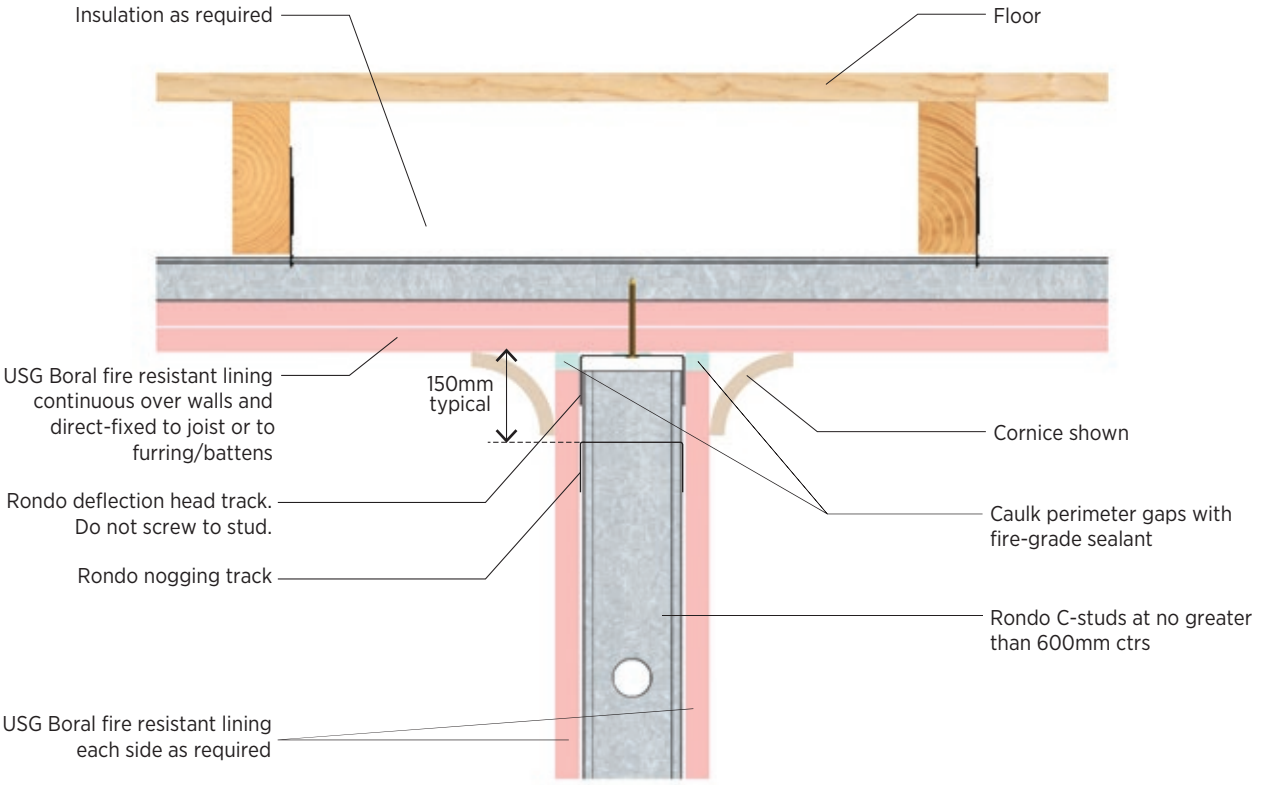


Figure 55: **Fire-rated Wall Deflection Head to Fire-rated Ceiling Detail**

» FIRE-RATED STEEL STUD WALLS

DOOR DETAILS

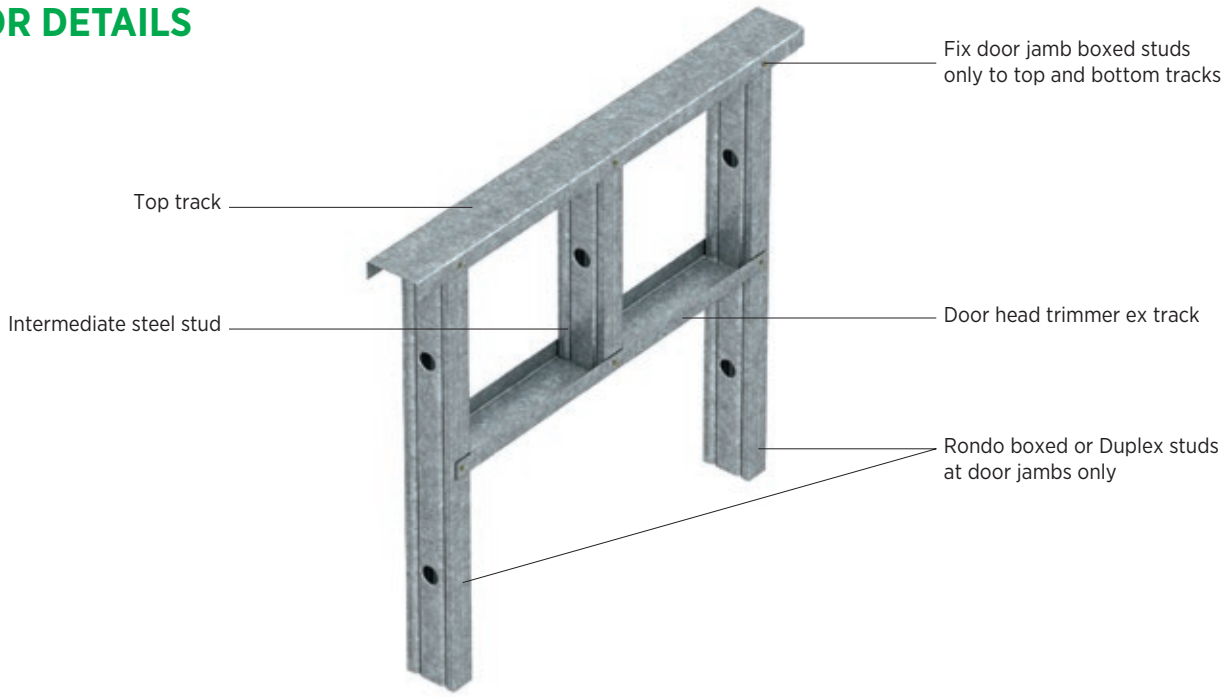


Figure 56: **Door Head Trimmer Detail**

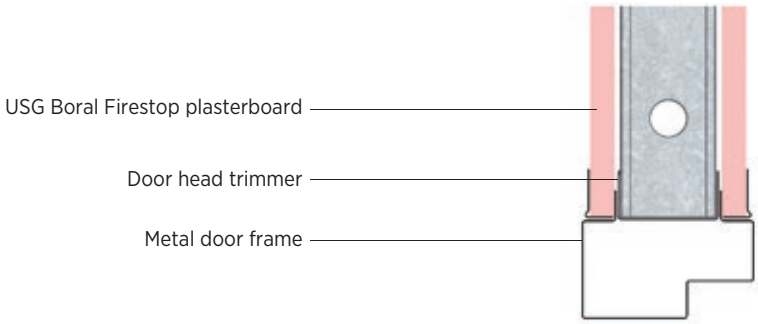


Figure 57: **Door Head Detail**

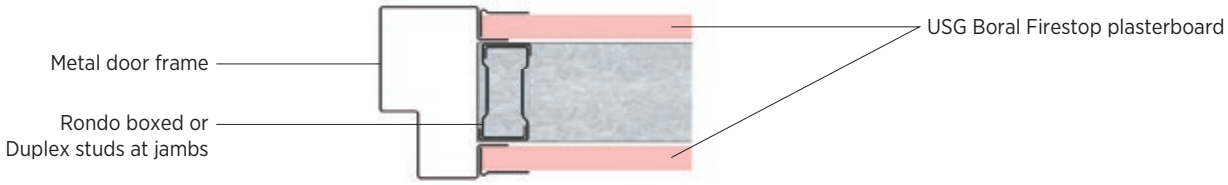


Figure 58: **Door Jamb Detail**

NOTE:

Jamb studs may consist of Rondo boxed or Duplex studs. This may be determined by the structural requirements or the fixing details recommended by the door frame manufacturer. Door jamb studs may also use timber flitch studs inside where higher strength of hinge screw holding is required.

» FIRE-RATED STEEL STUD WALLS

PLUMBING PENETRATIONS uPVC

1. The installation of uPVC pipes that run through FRR system walls needs special attention to detail.
2. Install Rondo nogging track around the pipe penetration and screw back to the steel framing as shown in Fig. 59.
3. Install insulation for the STC / Rw as required by the specified system.
4. Secure USG Boral FRR plasterboard layer(s) to each side, as required. For screw lengths and spacing, refer to General Information – Fasteners, Tables 2-4.
5. Install the appropriate fire collar to the manufacturer's recommendations. Ensure the FRR of the fire collar is equal to or greater than the FRR of the plasterboard. Secure the fire collar to the Rondo nogging tracks using steel screws. Refer to General Information – Fasteners, Tables 2-4.

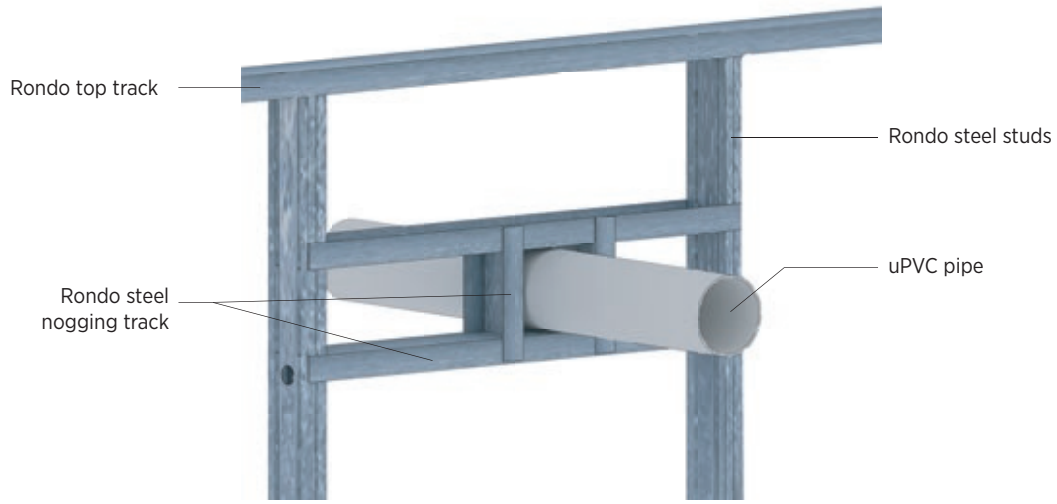


Figure 59: **Penetration Detail – Framing Support Construction**

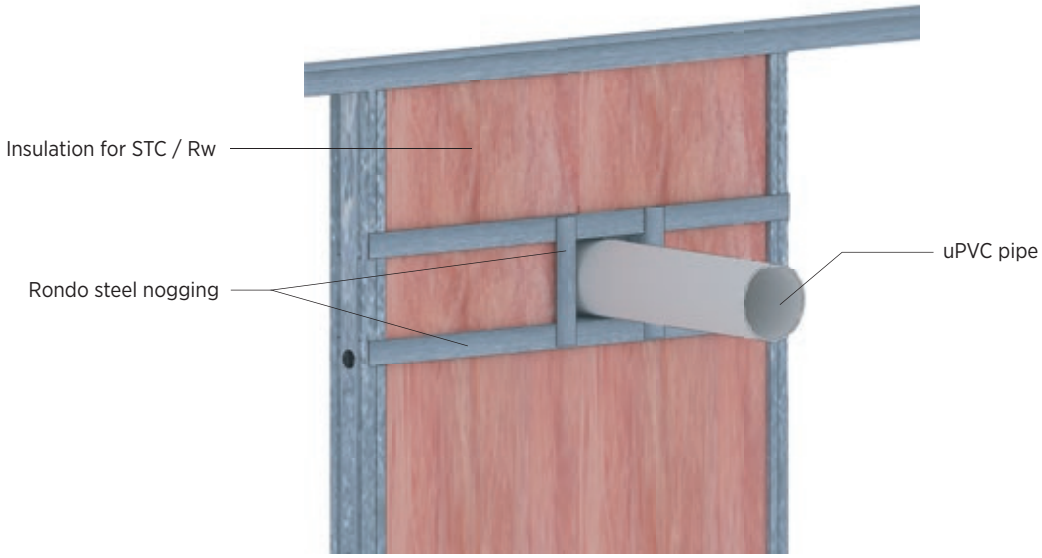


Figure 60: **Penetration Detail – Insulation Installed**

» FIRE-RATED STEEL STUD WALLS

PLUMBING PENETRATIONS

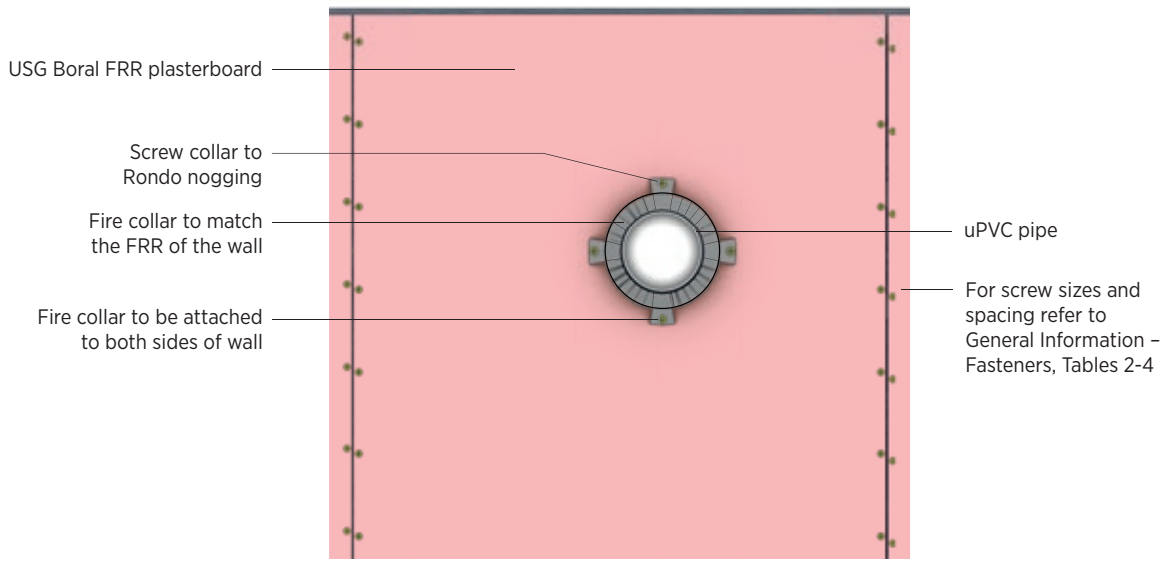


Figure 61: **Penetration Detail – Fixing Fire Collar**

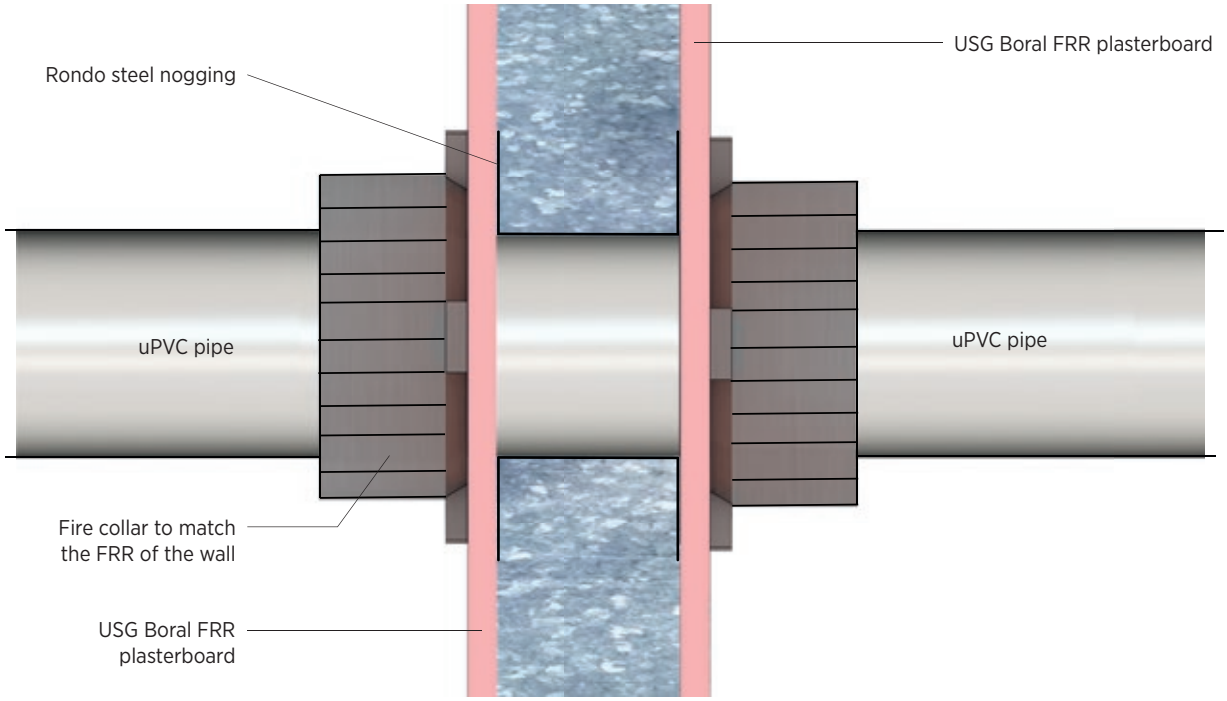


Figure 62: **Penetration Detail – Installed Section View**

NOTES:

- All plasterboard is to be mechanically fixed with screws – gluing is NOT permitted. Maximum steel stud spacing 600mm.
- All FRR plasterboard and layers as required by the specified system are applicable to this detail.

FIRE-RATED STEEL STUD WALL DETAILS

PIPE PENETRATIONS CAST IRON

1. The installation of cast iron pipes that run through FRR system walls needs special attention to detail.
2. Install Rondo nogging track around the pipe penetration and screw back to the steel framing as shown in Fig. 63.
3. Install insulation for the STC / Rw as required by the specified system.
4. Secure USG Boral FRR plasterboard layer(s) to each side, as required. For screw lengths and spacing, refer to General Information – Fasteners, Tables 2-4.
5. Install FRR sealant around the pipe to be the same or greater FRR as the plasterboard.

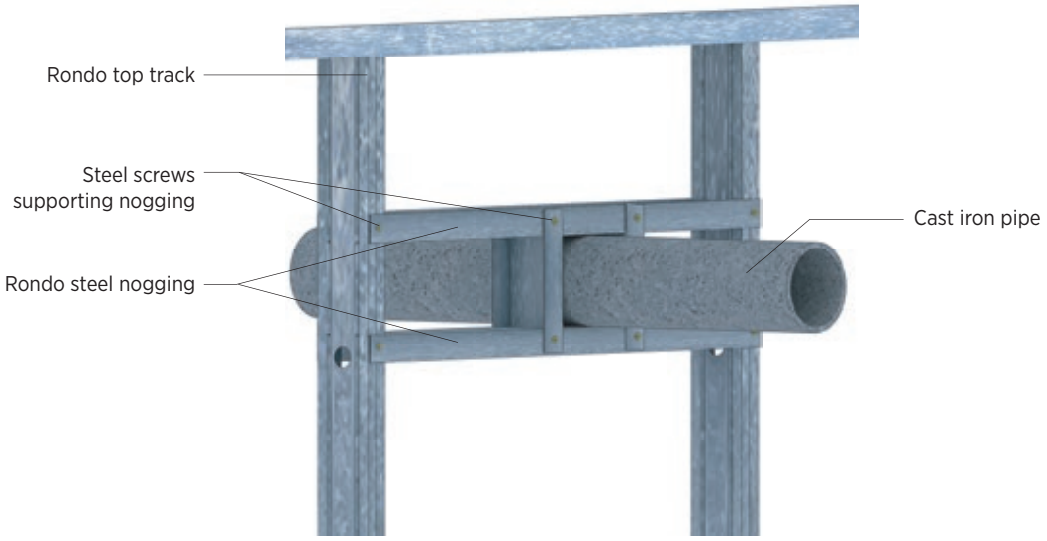


Figure 63: **Penetration Detail – Framing Support Construction**

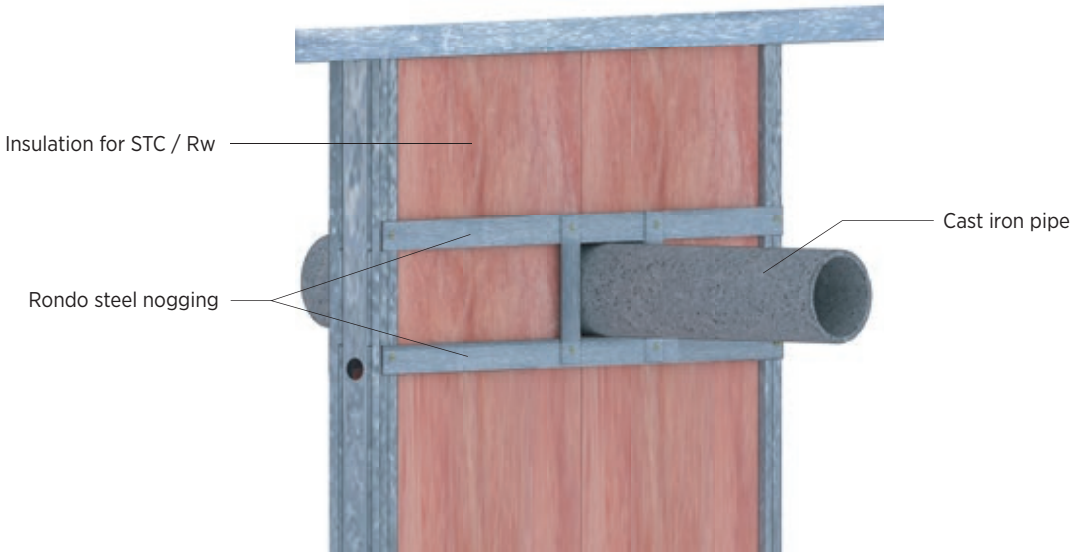


Figure 64: **Penetration Detail – Insulation Installed**

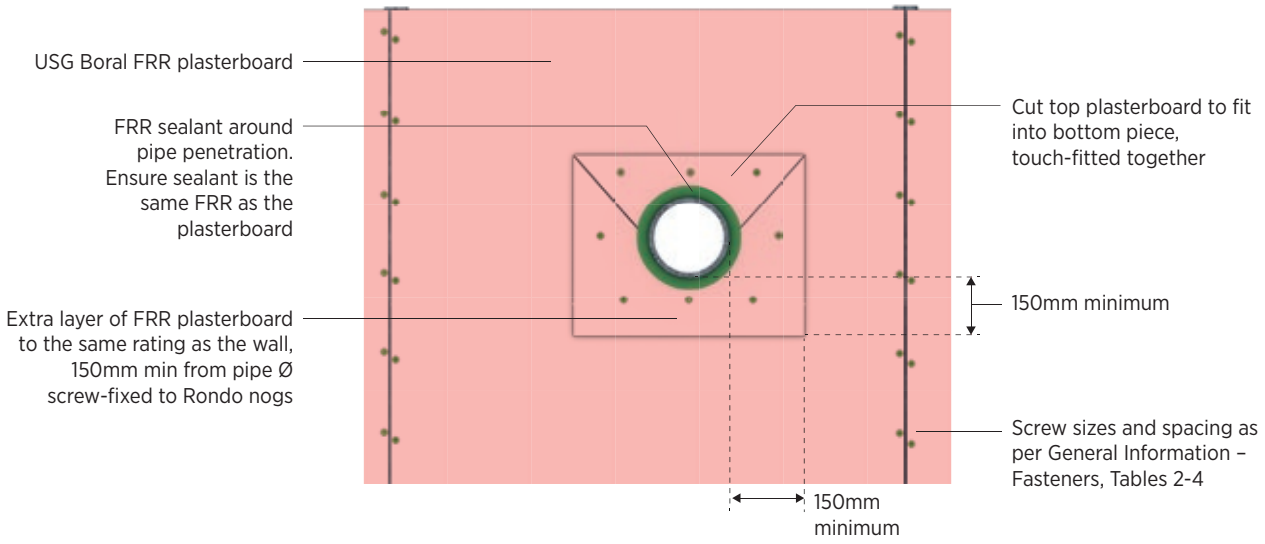


Figure 65: **Penetration Details – Fitting Extra Plasterboard Layer**

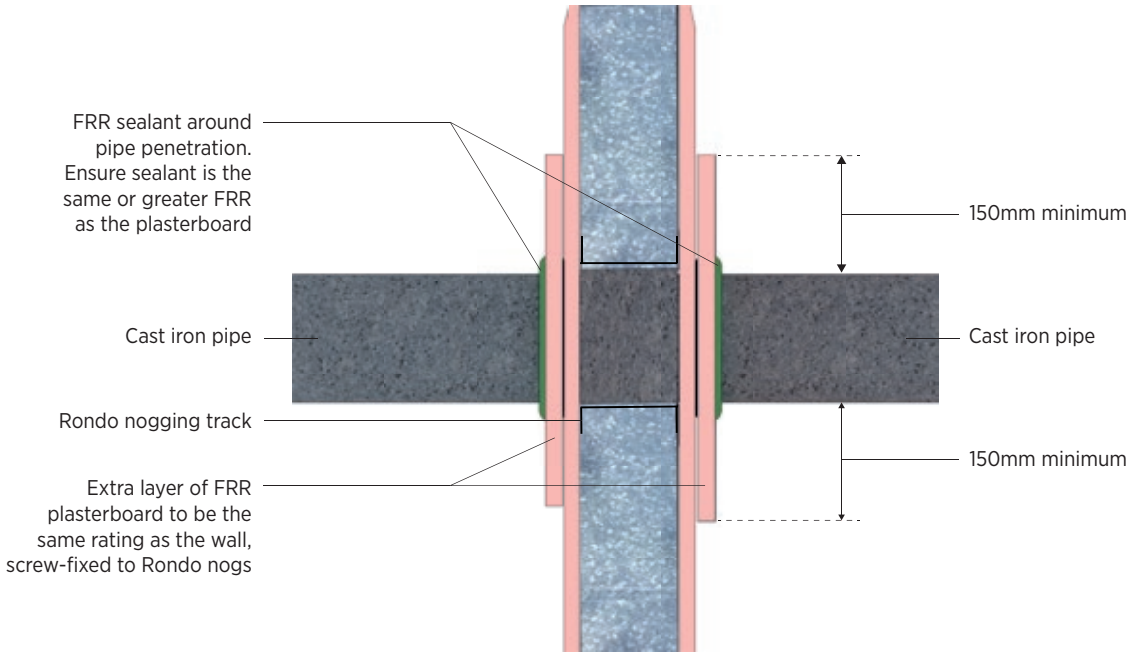


Figure 66: **Penetration Details – Installed Section View**

NOTES:

- All plasterboard is to be mechanically fixed with screws – gluing is NOT permitted. Maximum steel stud spacing 600mm.
- All FRR plasterboard and layers as required by the specified system are applicable to this detail.

» FIRE-RATED STEEL STUD WALLS

PLUMBING PENETRATIONS

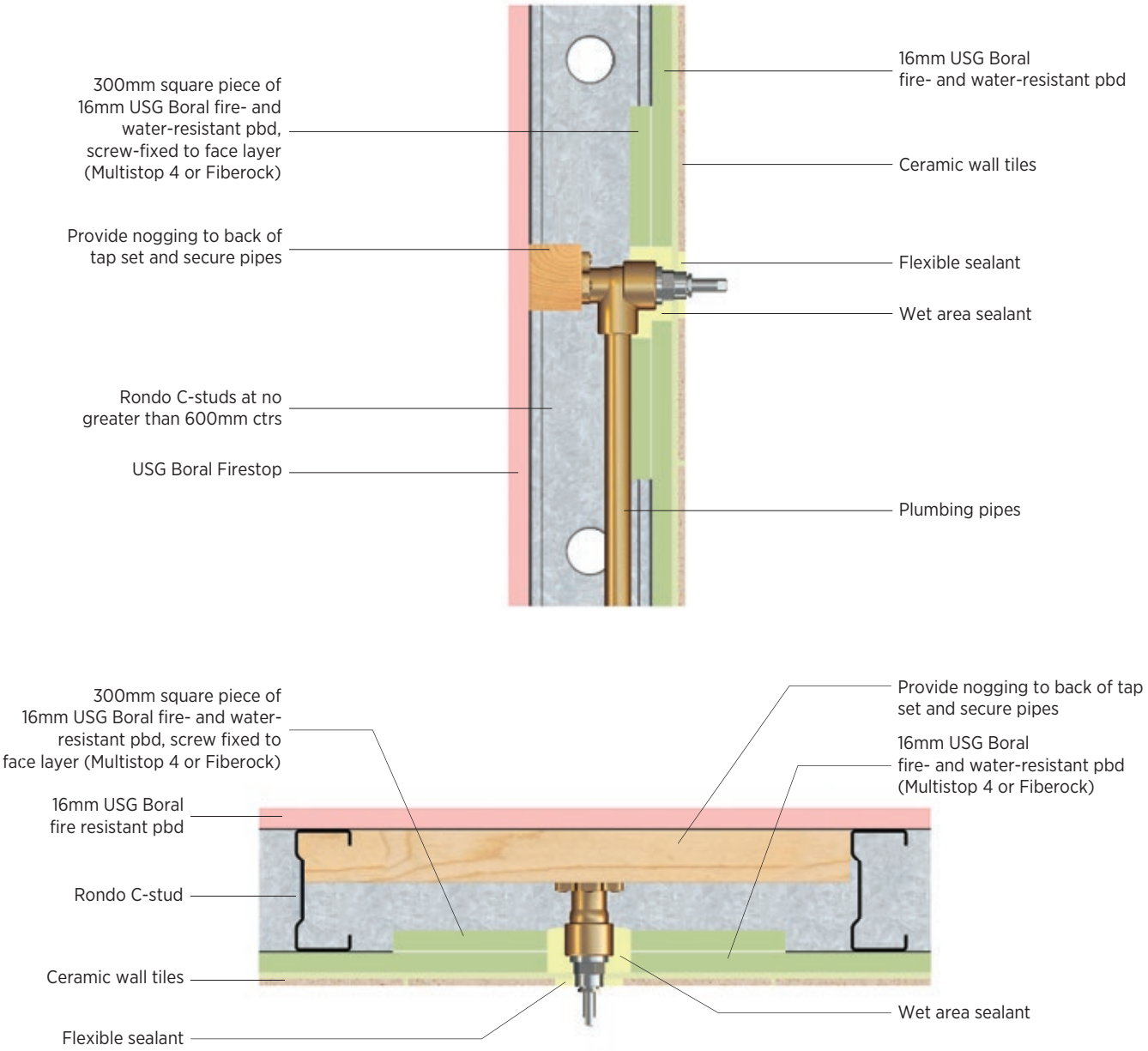


Figure 68: **Typical Plumbing Penetration Detail – Plan**

NOTES:

The following instructions must be followed to achieve satisfactory results:

- Care should be taken to isolate copper pipes away from contact with steel framing to avoid problems with corrosion.
- Plasterboard linings are not to act as supports for piping.
- Piping is to be kept clear of face sheets and baffles.
- Ensure that baffles protect the areas immediately behind wall penetrations.
- Pipes are to penetrate only one face of the partition between any two wall studs.
- Total area of all openings between any two wall studs must be no greater than 5000mm^2.

» FIRE-RATED STEEL STUD WALLS

ELECTRICAL PENETRATIONS

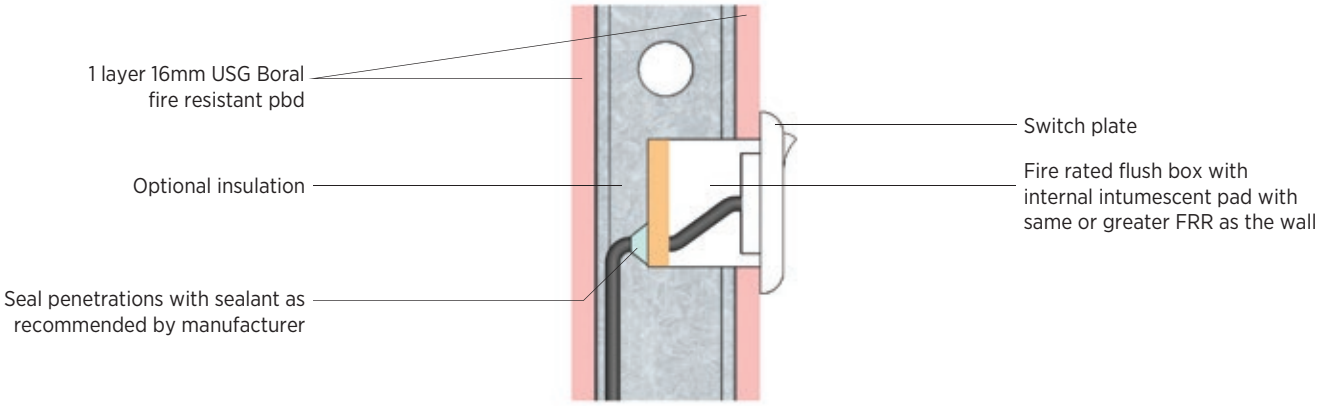


Figure 69: **Fire-rated GPO Detail Only – Partition FRR 60/60/60**

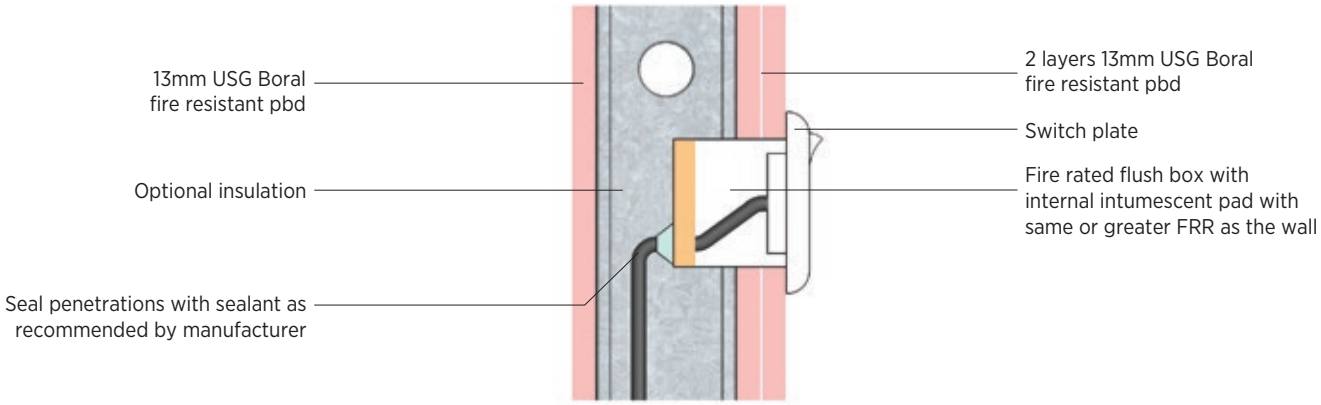


Figure 70: **Fire-rated GPO Detail Only – Partition FRR 90/90/90**

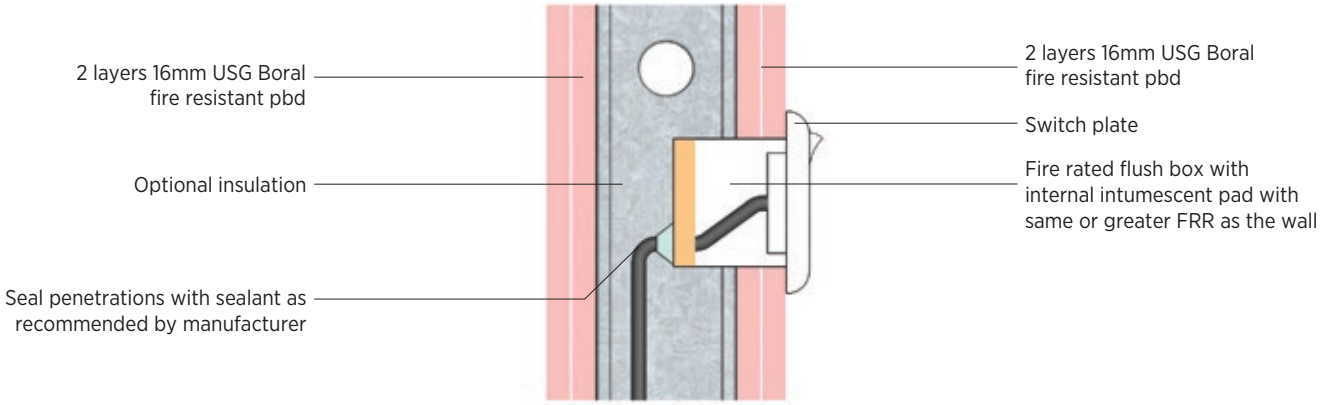


Figure 71: **Fire-rated GPO Detail Only – Partition FRR 120/120/120**

» FIRE-RATED STEEL STUD WALLS

ELECTRICAL PENETRATIONS

Electrical wall penetrations must be installed as per the details below. Alternative electrical switches may be used with intumescent padding. References must be obtained from the manufacturer's specification and installation details.

The FRR of any intumescent flush boxes must be equal to or greater than the FRR of the wall. Ensure all electrical switches (power sockets or switches) are installed with metal flush boxes.

STEP 1

1. Install steel horizontal nogs between studs.
2. Install steel vertical nogs where the electrical outlets will be positioned.
3. Screw-fix all nogs as shown.
4. Line FRR plasterboard internally and secure to steel nogging with appropriate screws.
5. Screws to be spaced no greater than 100mm centres.

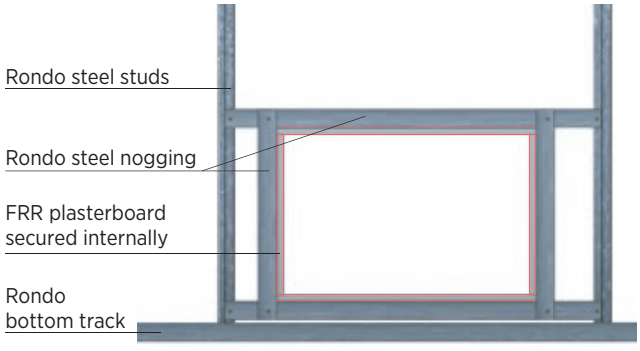


Figure 72: **Frame Support Construction**

STEP 2

1. Install top and bottom 30 x 30mm x 0.55 BMT (minimum) angle and secure through plasterboard into steel nogs.
2. Install FRR plasterboard to the angle to form a baffle to the same dimensions as the cutout. Ensure there are no visible gaps.
3. Secure the FRR plasterboard with 3 screws to top and bottom of the angles.
4. Apply FRR sealant to the plaster baffle board edges. Ensure the sealant is to the same or greater FRR as the plasterboard.
5. Install the steel flush boxes to the vertical edge nogs through the plasterboard and secure with 2 screws. Screw lengths are dependent on the plasterboard thickness.
6. The plasterboard baffle can be secured from the front or back, which is dependent on either a one-way or a two-way system.

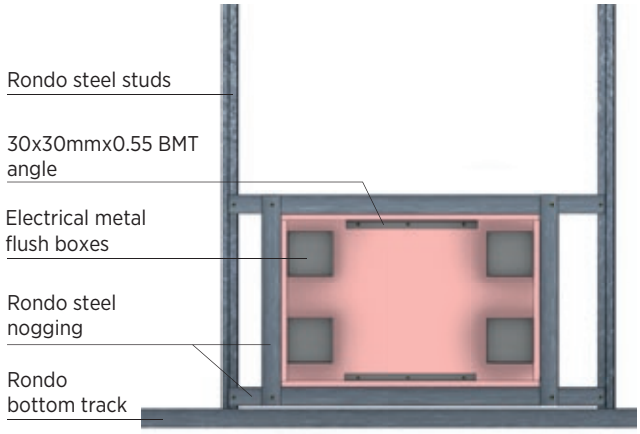


Figure 73: **Installation of Plasterboard Baffle**

STEP 3

1. Install insulation for the required STC / Rw acoustic rating.

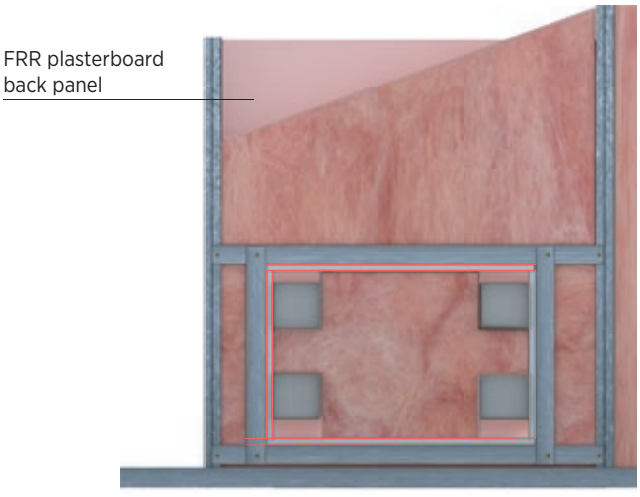


Figure 74: **Installation of Insulation**

STEP 4

1. Install the front and/or back FRR plasterboard(s) of the selected system.
2. Install screws into the FRR plasterboard as specified in General Information – Fasteners, Tables 2-4 for the correct application and plasterboard thickness.
3. Install 2 screws per box as indicated on either side of the metal flush boxes up the vertical nogs as indicated in Fig. 75.
4. Plaster and finish to the required level.

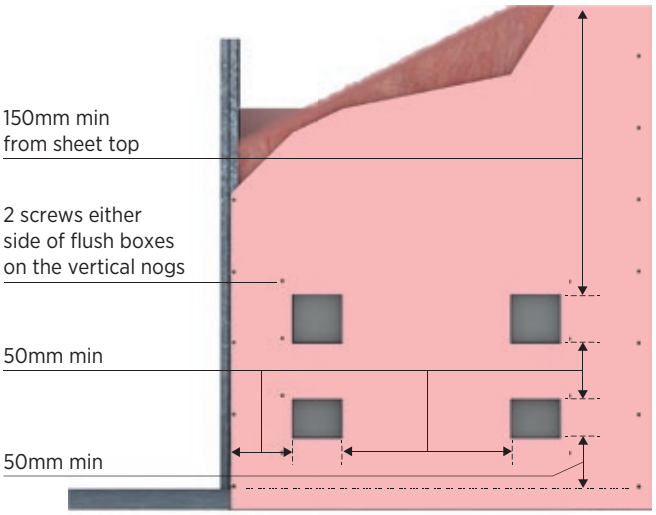


Figure 75: **Installation of Plasterboard Other Side**

Typical Layout Plan – Non-Fire Rated GPOs in FRR 60/60/60 Partition

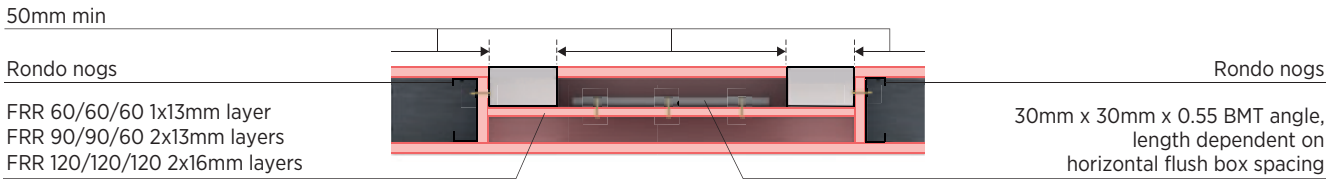


Figure 76: **Non-Fire Rated GPOs Plan**

Typical Layout Plan – Non-Fire Rated GPOs In FRR 90/90/90 and 120/120/120

Use 2 x 13mm or 1 x 16mm USG Boral fire resistant plasterboard baffle in partition cavity for the above systems. Refer to General Information – Fasteners, Tables 2-4 for the correct screw sizes, spacings and layer combinations for the correct FRR.

Cable Trays

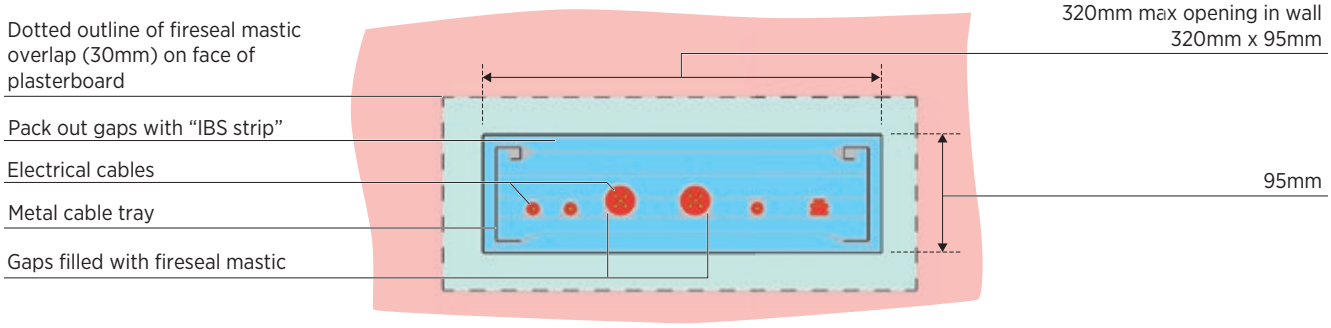


Figure 77: **Penetration Detail – Cable Tray – Section Through Tray**

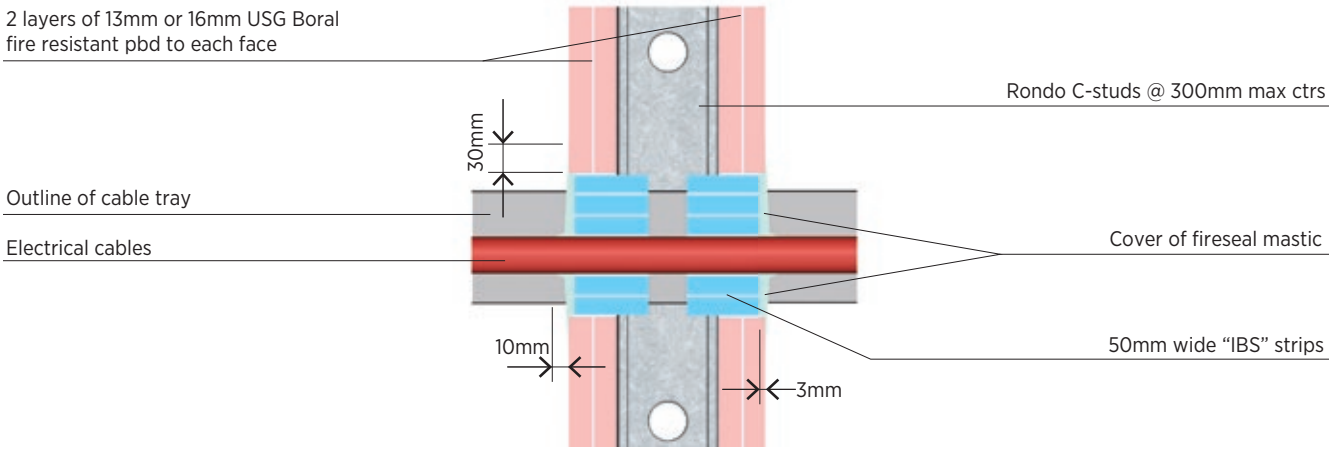


Figure 78: **Penetration Detail – Cable Tray – Section Through Wall**

» ACOUSTIC STEEL STUD WALL DETAILS

SMOKE AND ACOUSTIC DETAILS

1. Ensure all acoustic walls have at least 10-20mm acoustic sealant applied around the perimeter of the wall.
2. Install insulation for the required STC / Rw rating.
3. Press the plasterboard to the steel framing so that the acoustic sealant fills all gaps between the plasterboard and steel framing.
4. Smoke / acoustic walls may also act as FRR walls. Refer to the Steel Stud section for the correct FRR wall combination.
5. Ensure all penetrations through smoke / acoustic walls have sealant around the cover plates attached to metal flush boxes.

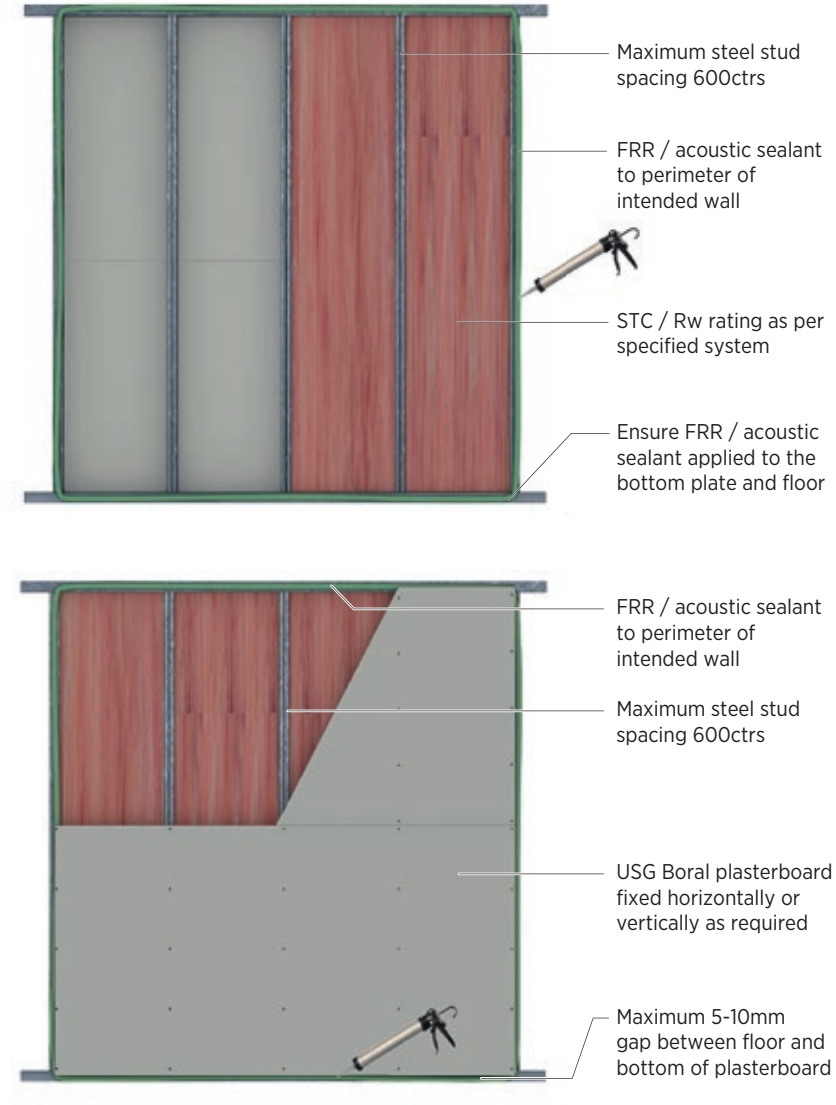


Figure 79: **Typical Electrical Power / Light Switch Penetration Detail**

FIRE-RATED TIMBER STUD WALLS

TERMINALS, JUNCTIONS AND CONTROL JOINTS

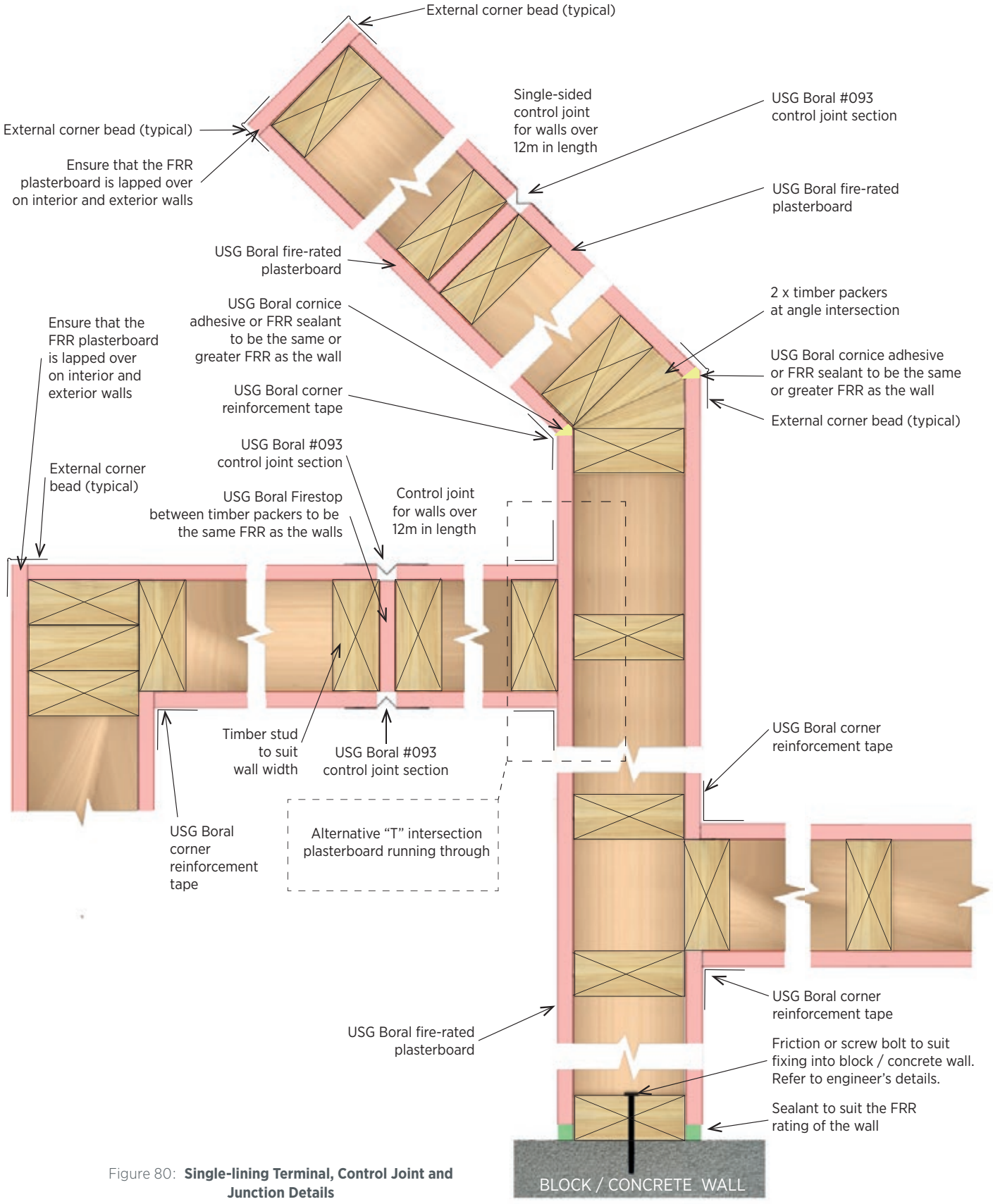


Figure 80: **Single-lining Terminal, Control Joint and Junction Details**

» FIRE-RATED TIMBER STUD WALLS

TERMINALS, JUNCTIONS AND CONTROL JOINTS

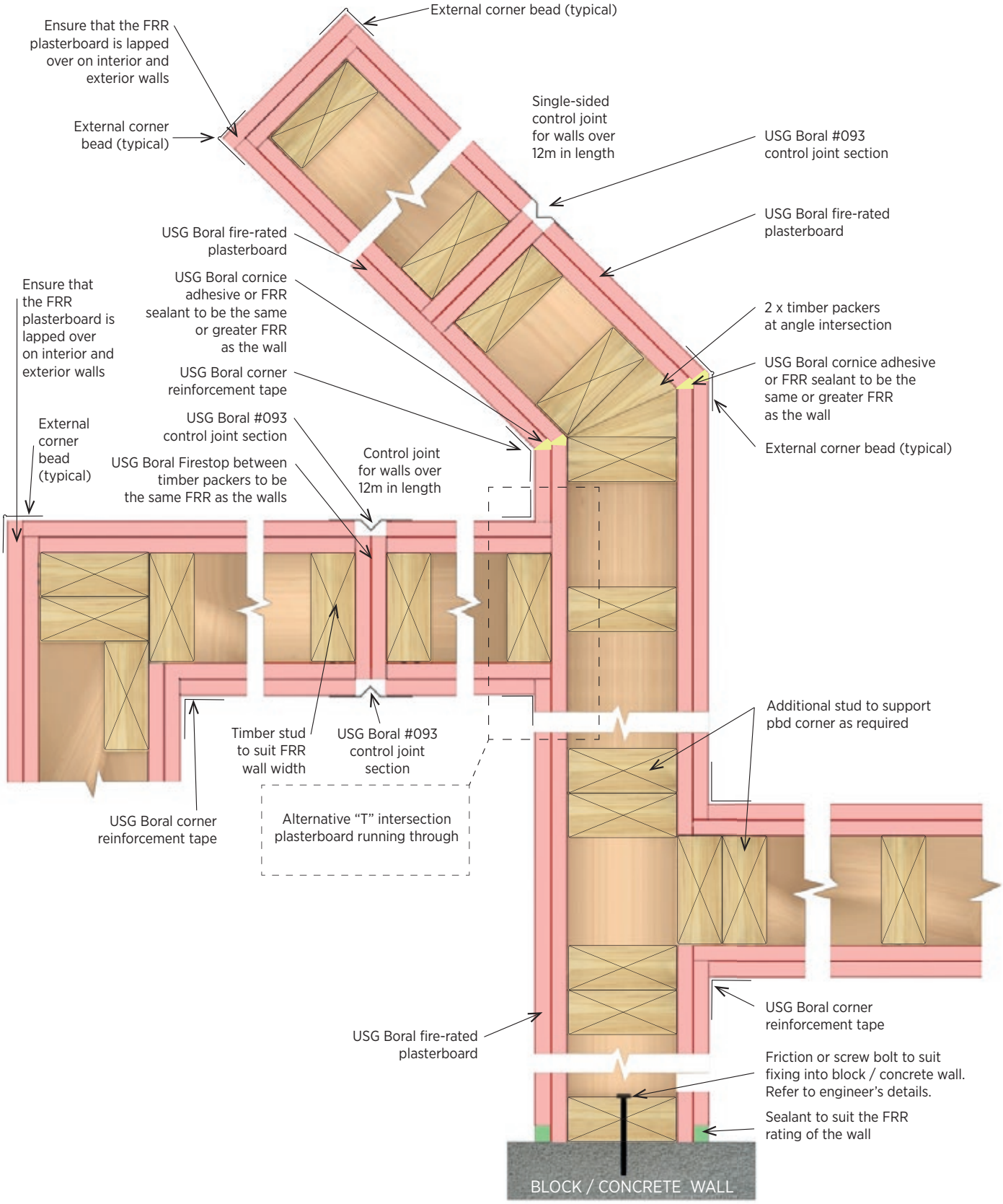


Figure 81: **Multi-lining Terminal, Control Joint and Junction Details**

» FIRE-RATED TIMBER STUD WALLS

WALL JUNCTIONS

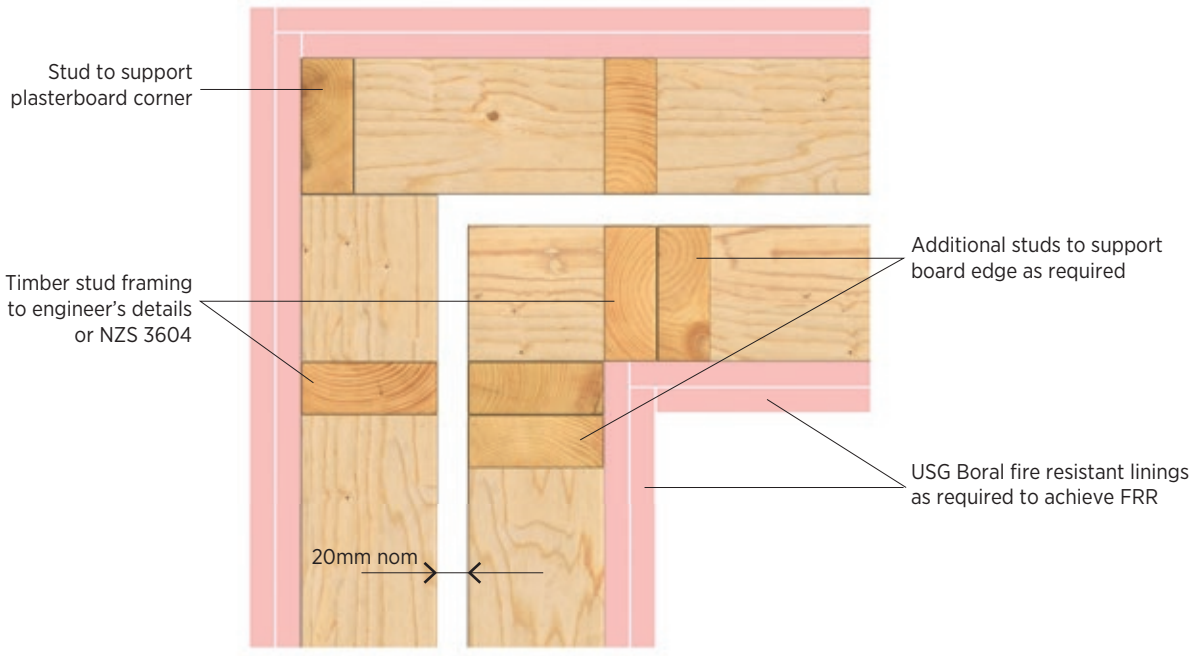


Figure 82: **Twin Timber Stud Wall – Corner Junction Detail**

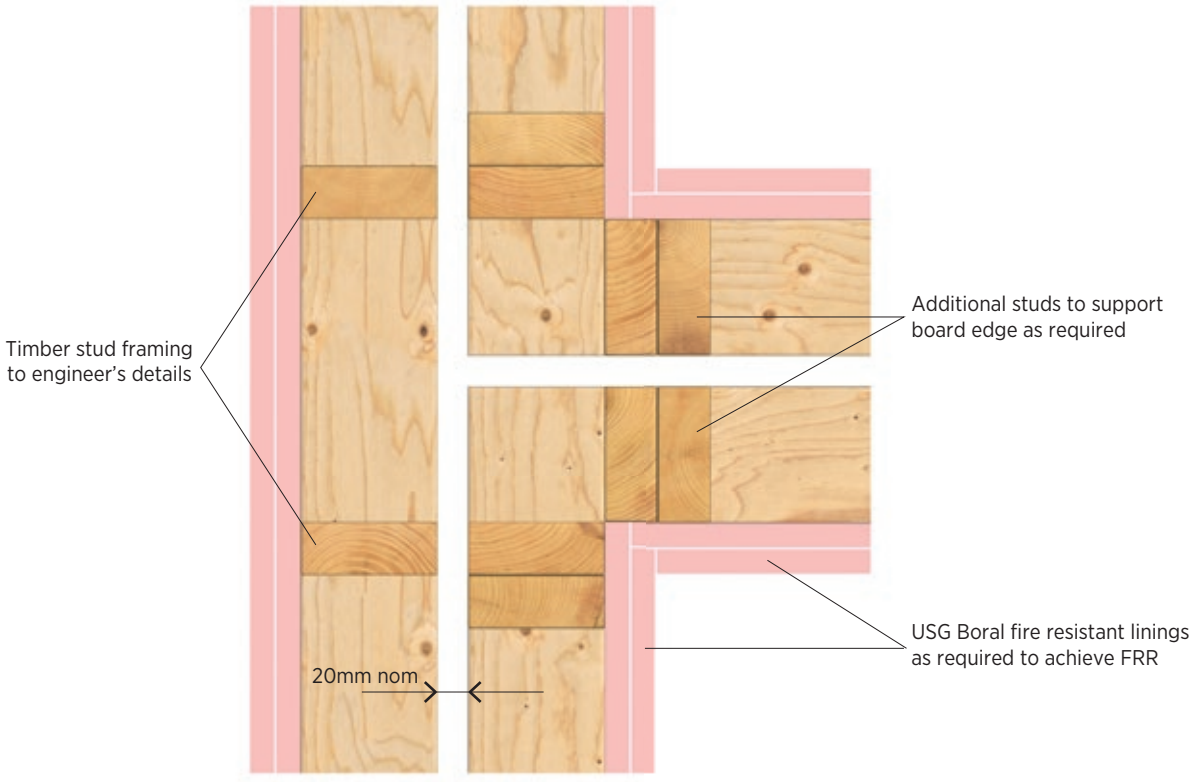


Figure 83: **Twin Timber Stud Wall – T Junction Detail**

» FIRE-RATED TIMBER STUD WALLS

WALL JUNCTIONS

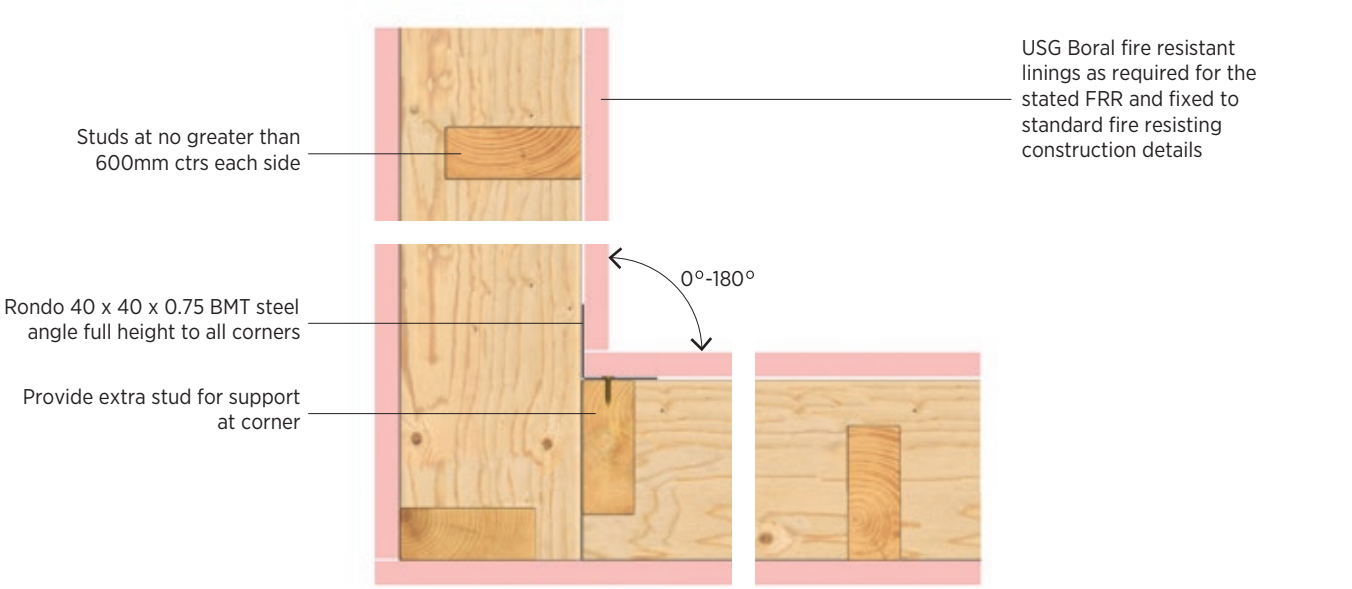


Figure 84: **Staggered Timber Stud Wall – Corner Junction Detail**

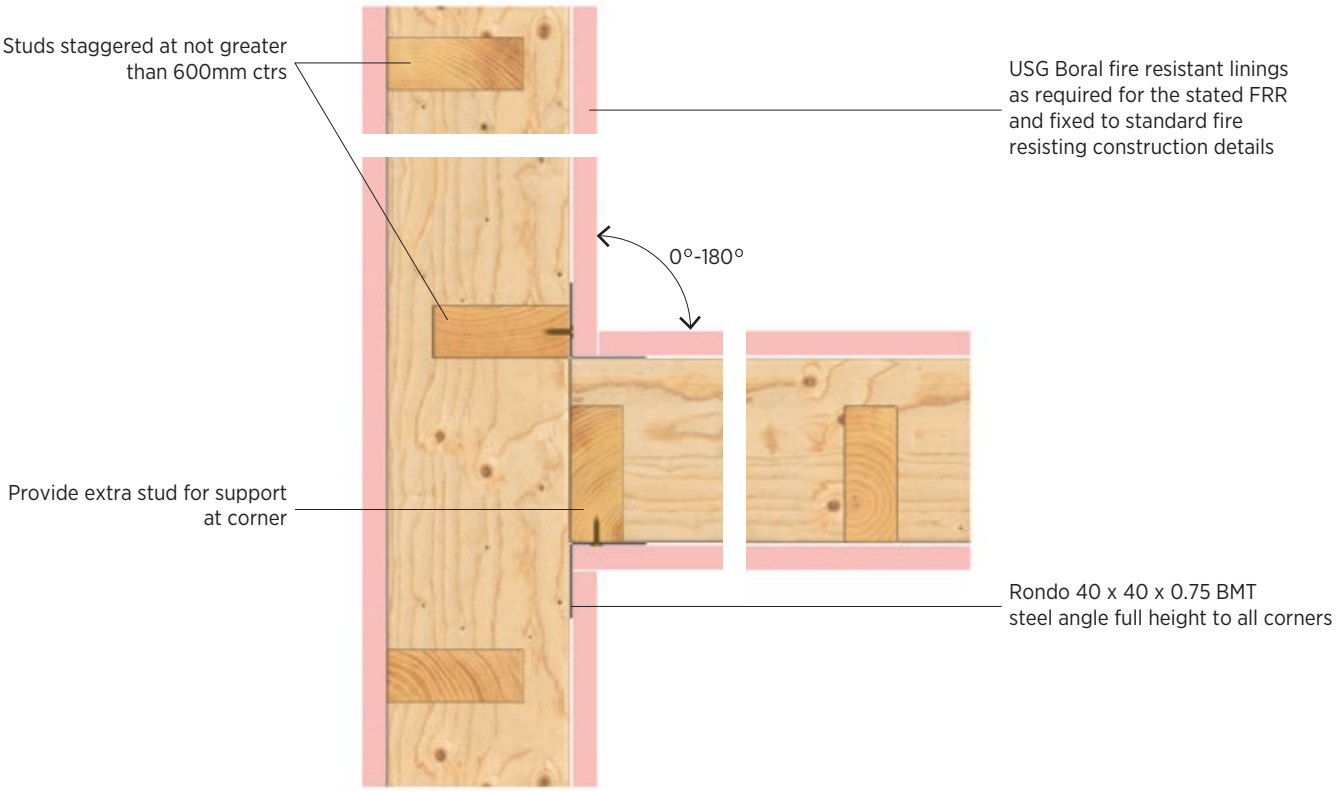


Figure 85: **Staggered Timber Stud Wall – T Junction Detail**

» FIRE-RATED TIMBER STUD WALLS

BASE DETAIL

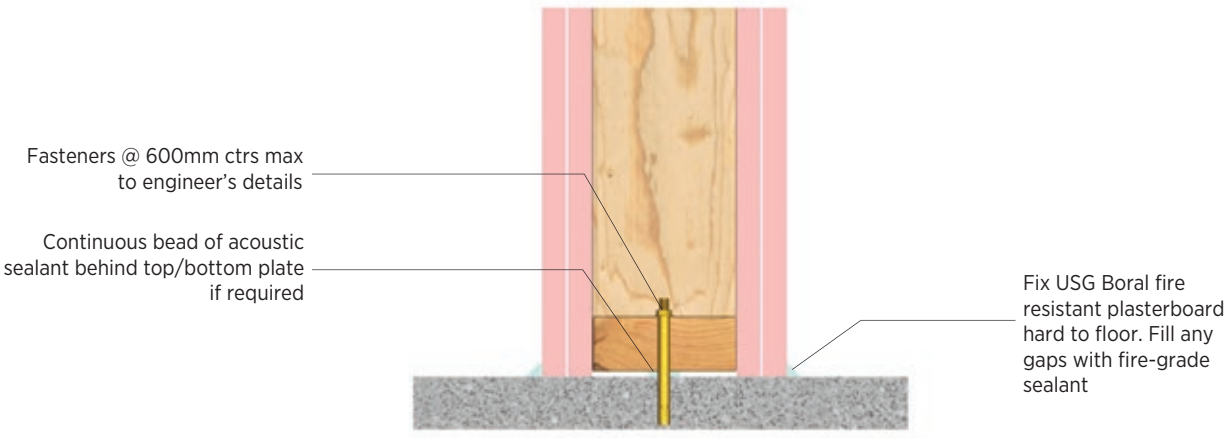


Figure 86: **Standard Timber Stud Wall – Base Detail**

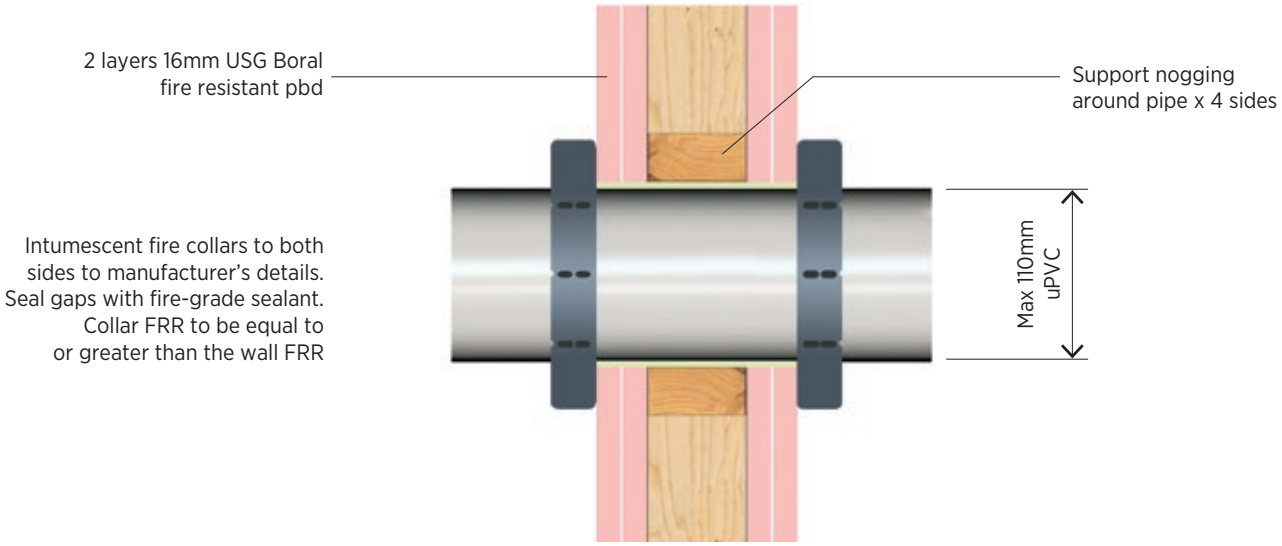


Figure 87: **Standard Timber Stud Wall – Pipe Penetration Detail**

» FIRE-RATED TIMBER STUD WALLS

HEAD DETAILS

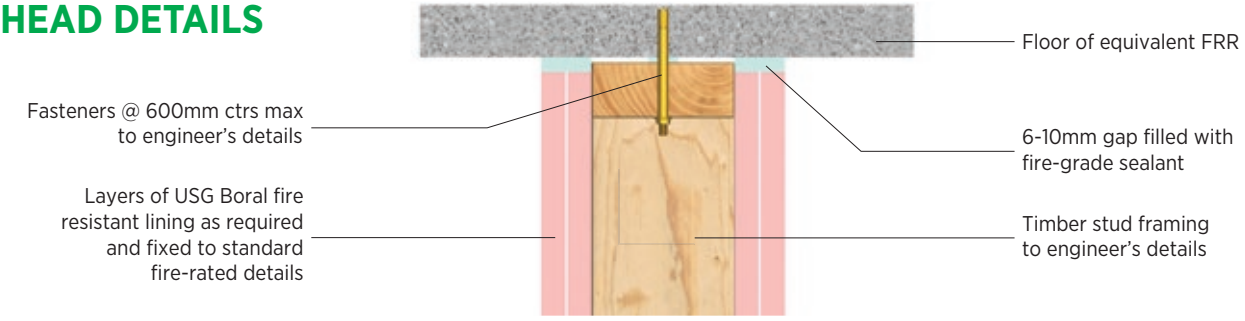


Figure 88: **Standard Timber Stud Wall – Head Detail**

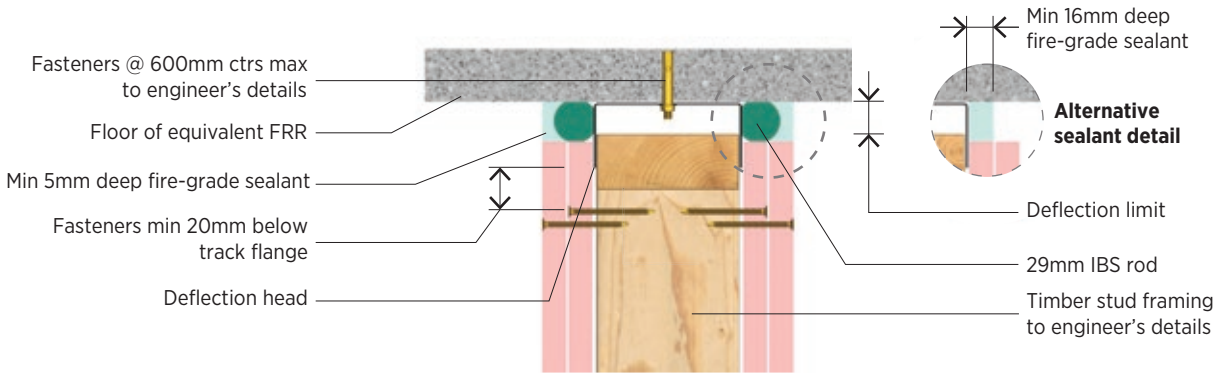


Figure 89: **Standard Timber Stud Wall – Deflection Head Detail**

NOTES:

- Maximum FRR 120/120/120.
- Caulk all gaps with USG Boral cornice adhesive or fire-grade sealant.
- Head track reaction and fastenings to engineer's designs.

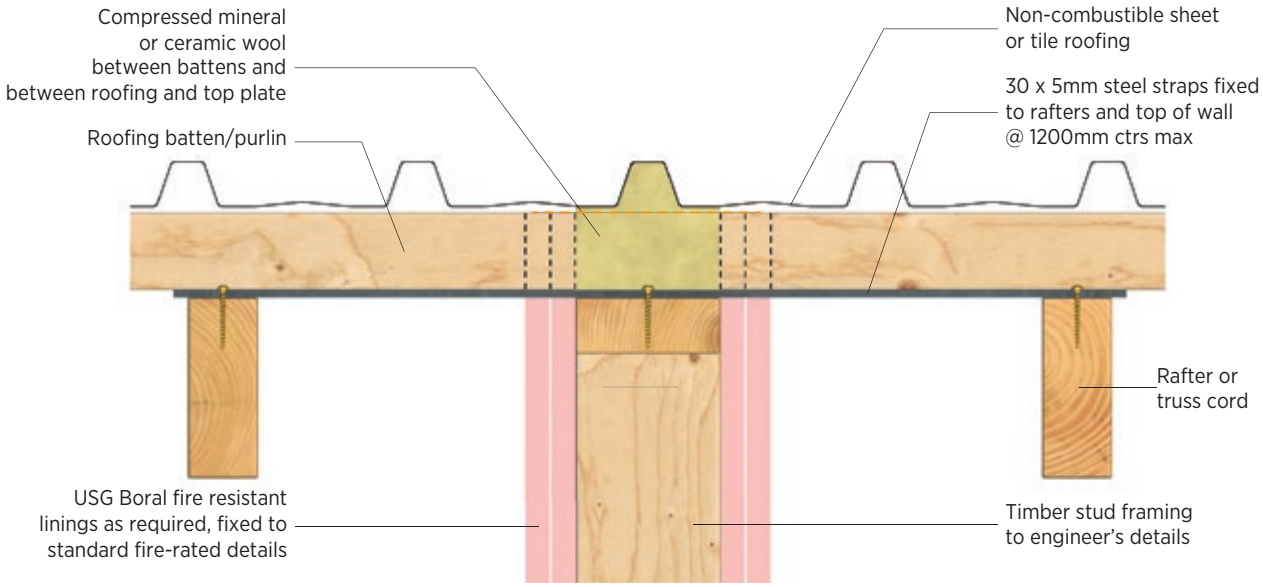


Figure 90: **Standard Timber Stud Wall – Head to Roof Junction Detail**

NOTE:

Maximum FRR 120/120/120.

» FIRE-RATED TIMBER STUD WALLS

ACOUSTIC DETAILS

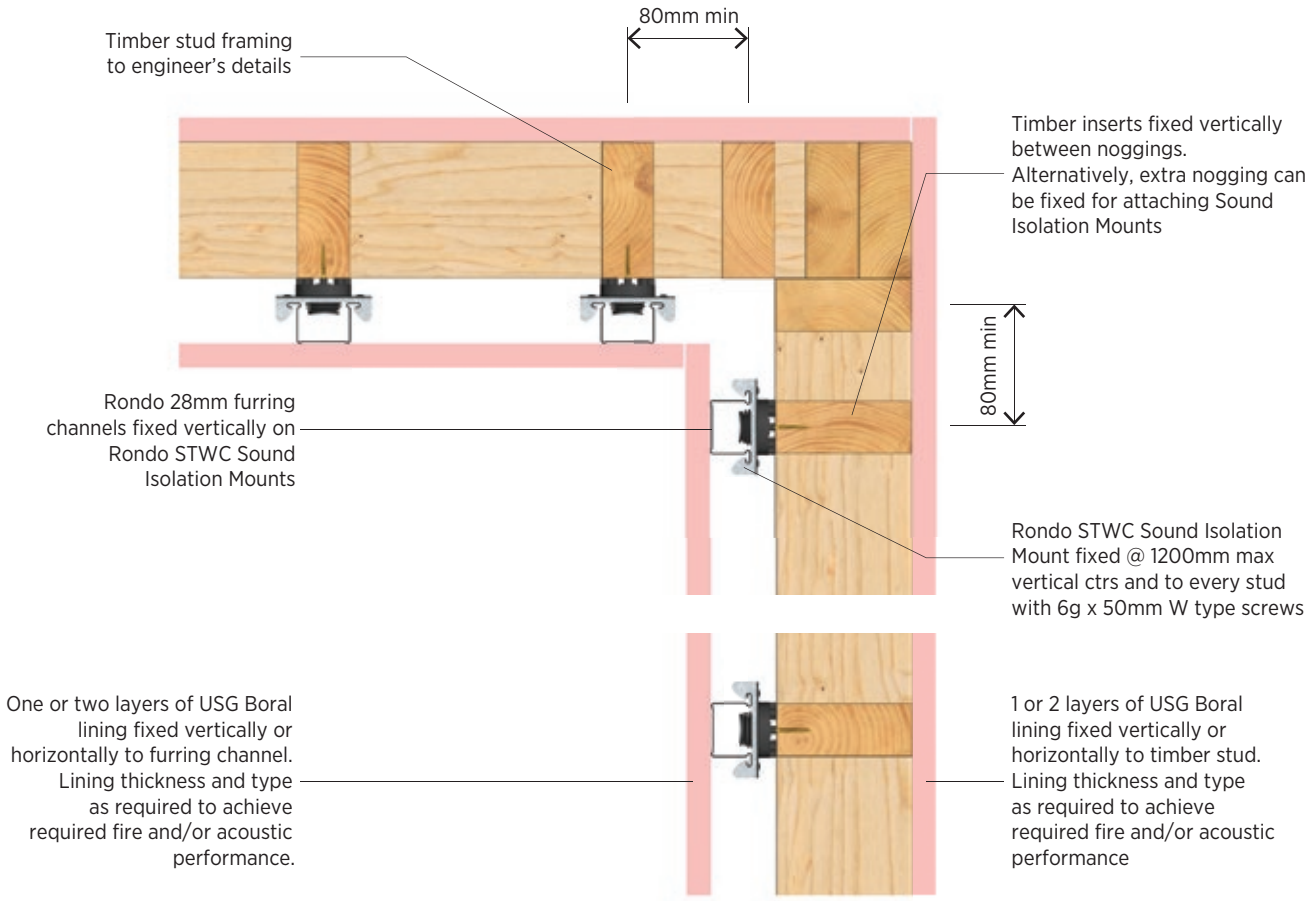


Figure 91: **Sound Isolation Mount – Corner Detail**

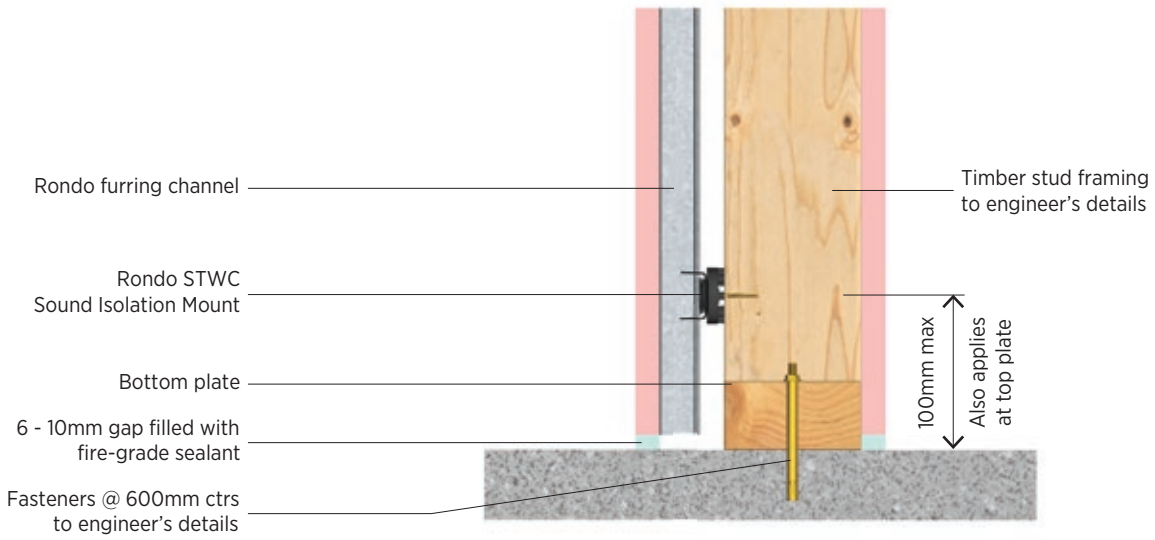


Figure 92: **Sound Isolation Mount – Base Detail**

FIRE-RATED CEILINGS

BACK-BLOCKING

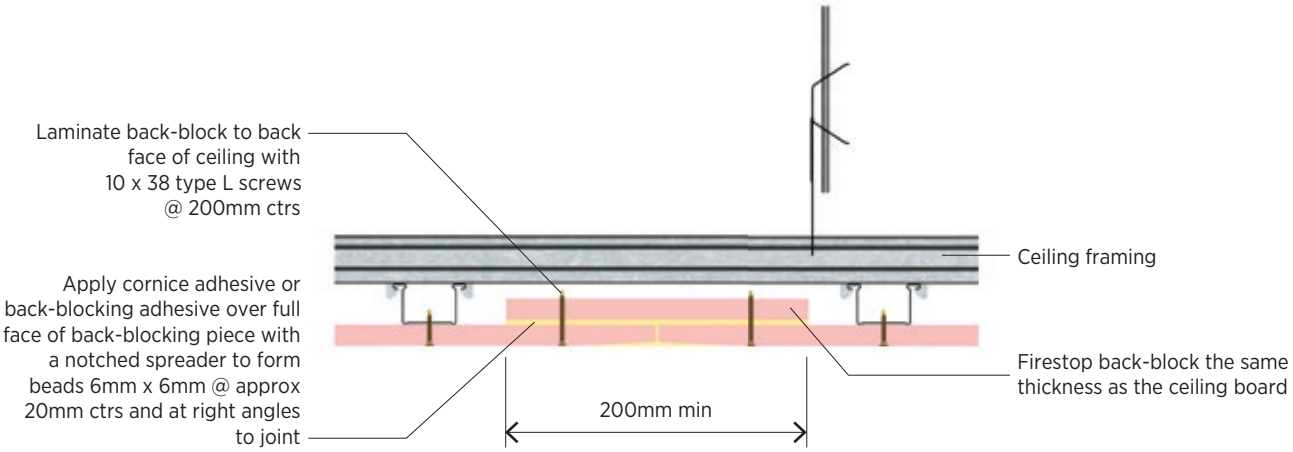


Figure 93: **Single-layer Back-block Detail**

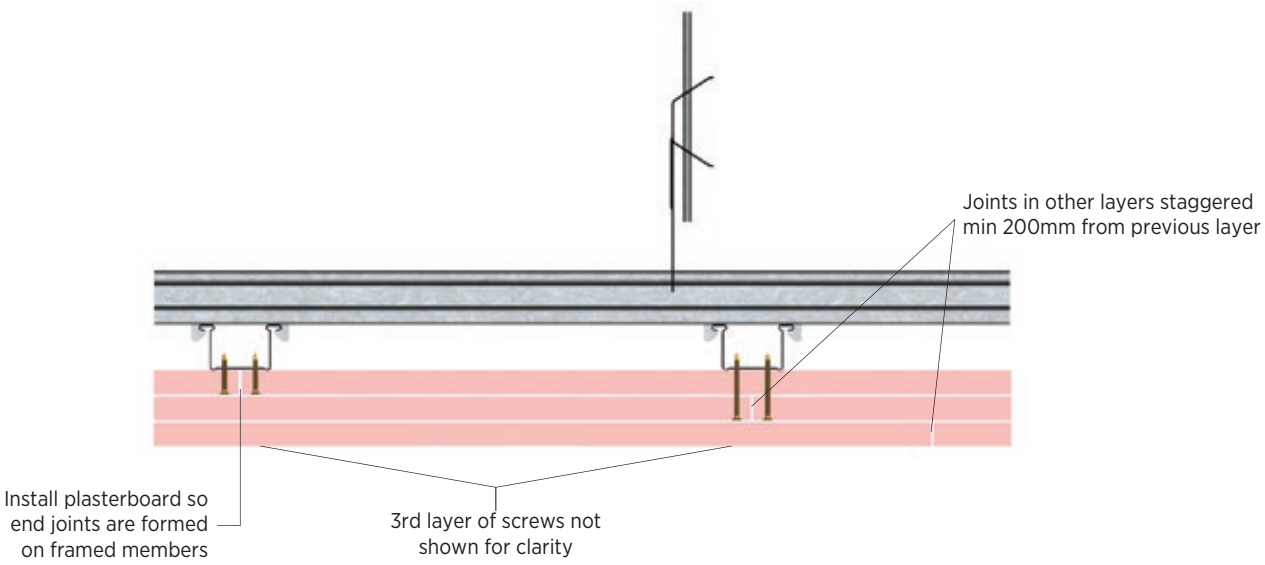


Figure 94: **Multi-layer Detail**

» FIRE-RATED CEILINGS

PERIMETER

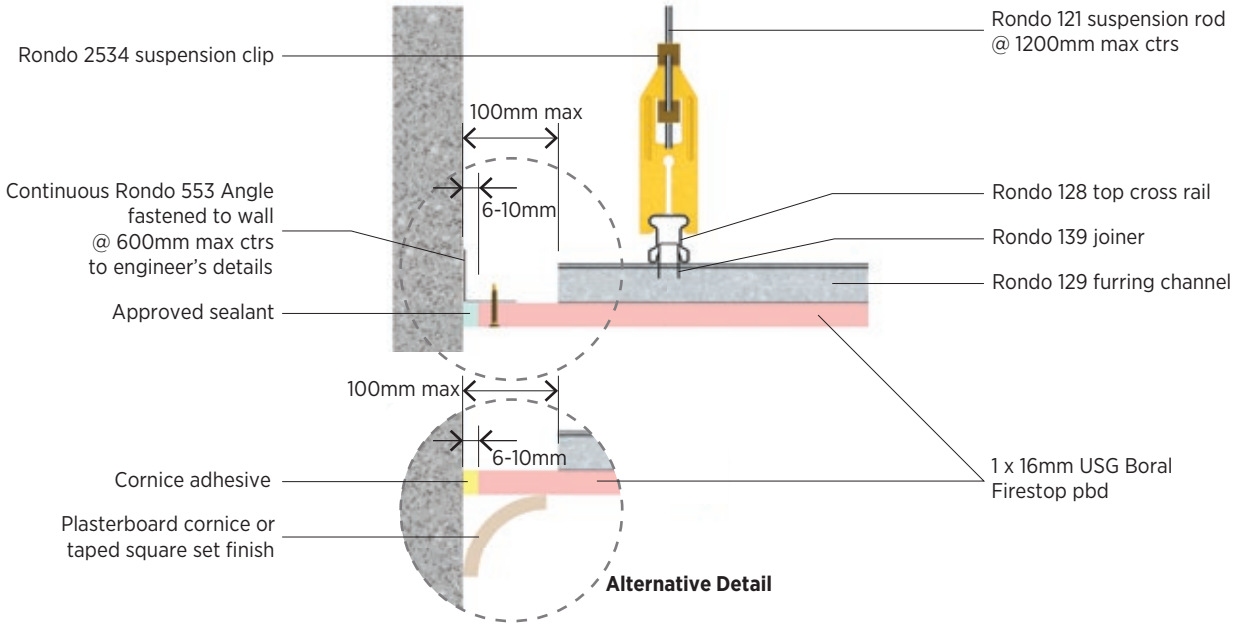


Figure 95: **Typical Perimeter Detail – FRR 30/30/30**

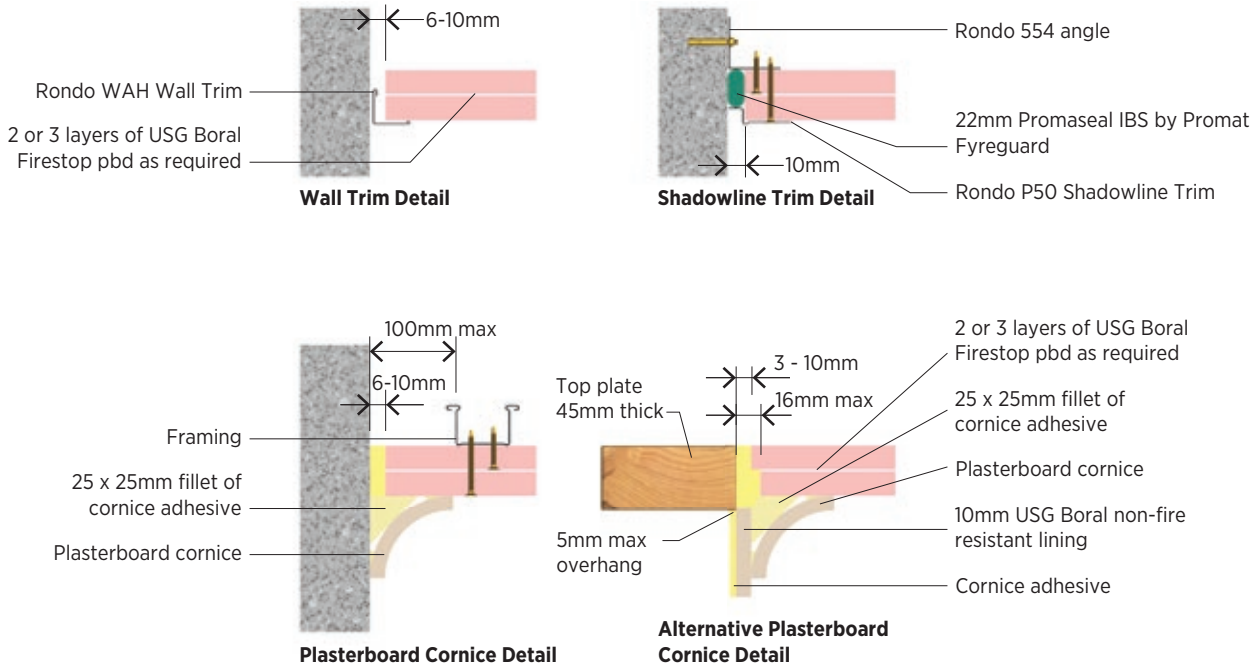


Figure 96: **Typical Perimeter Detail – FRR 60/60/60**

» FIRE-RATED CEILINGS

PERIMETER

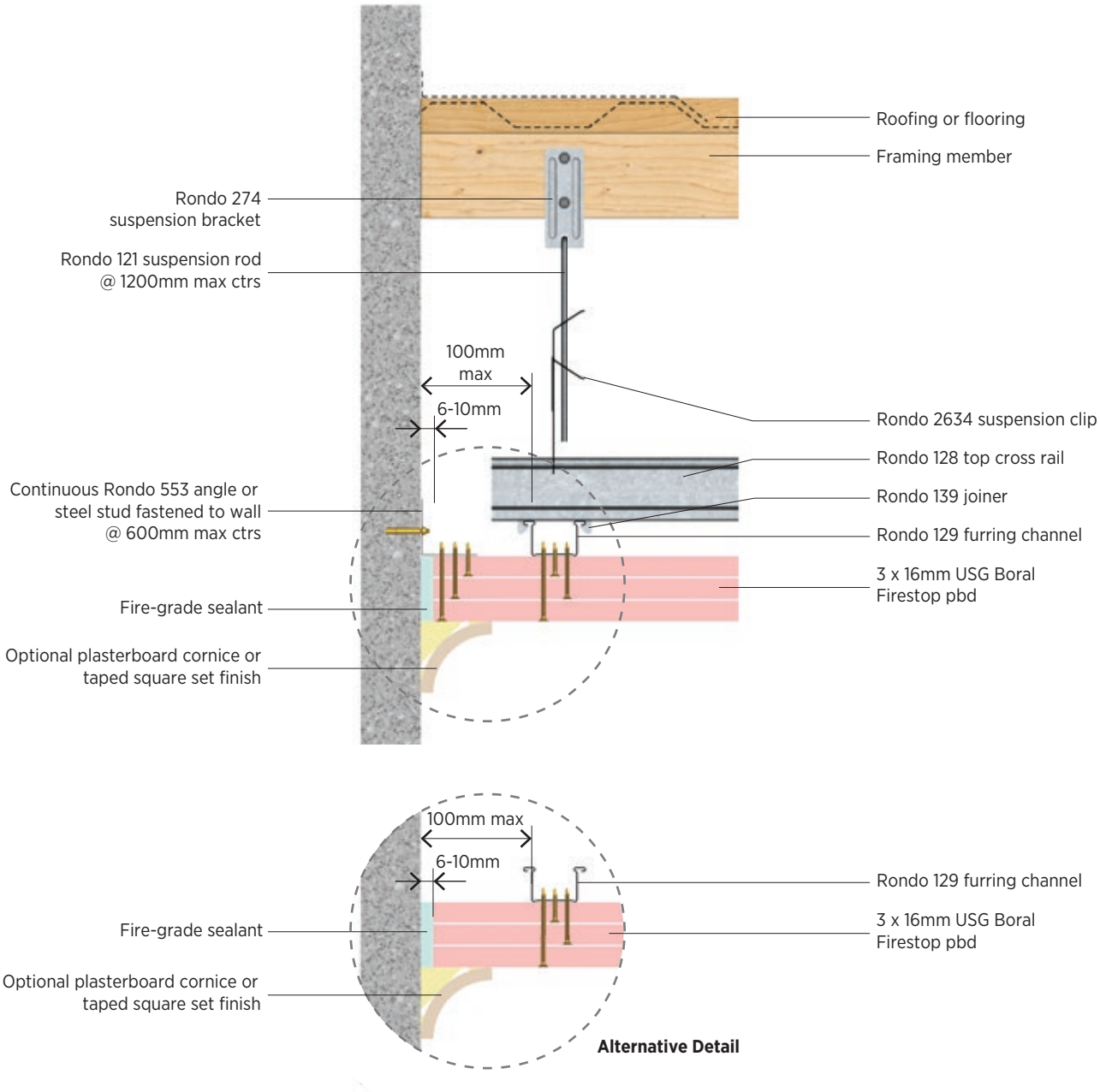


Figure 97: **Typical Perimeter Detail – FRR 90/90/90**

» FIRE-RATED CEILINGS

PERIMETER

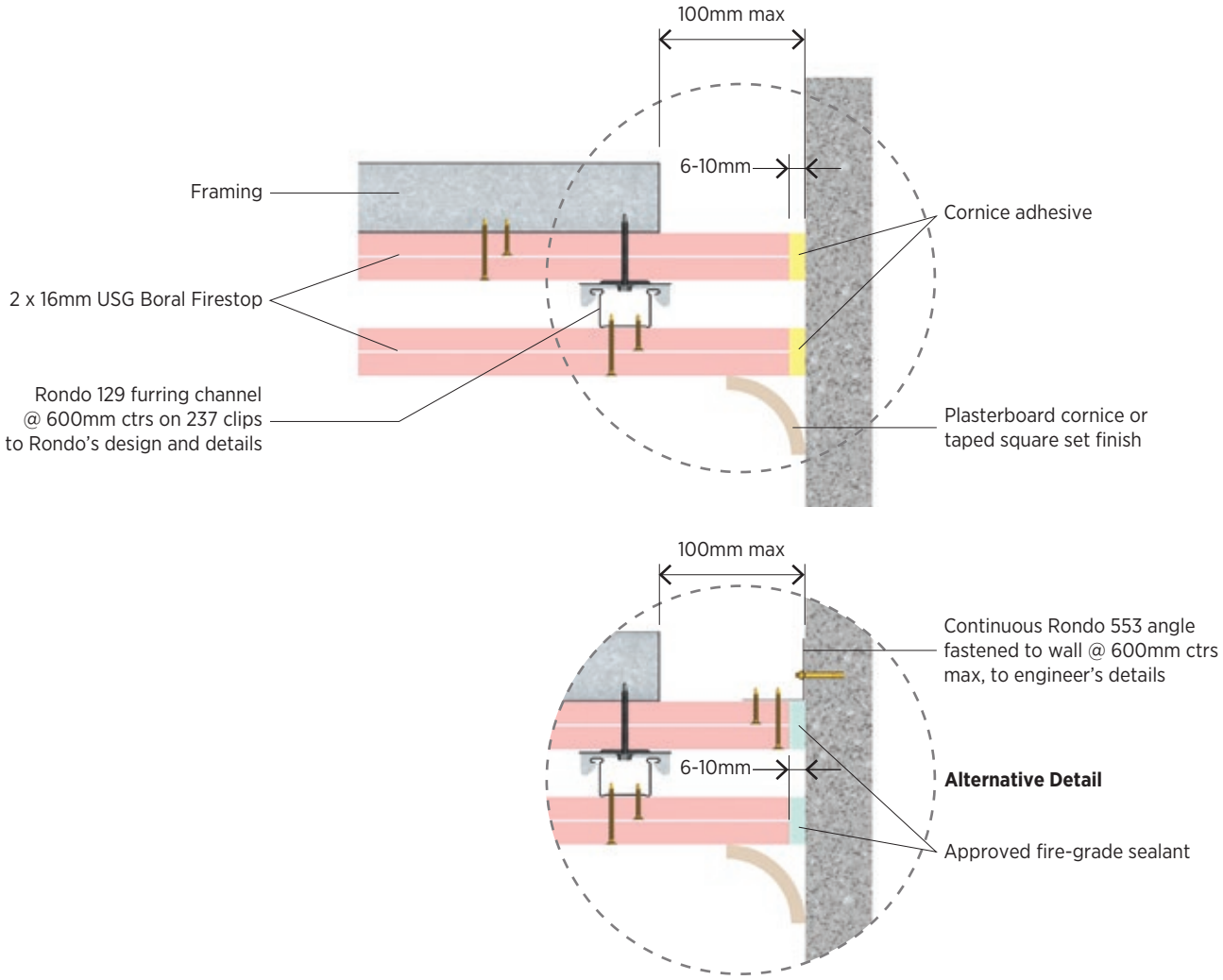


Figure 98: **Typical Perimeter Detail – FRR 120/120/120**

» FIRE-RATED CEILINGS

BULKHEAD

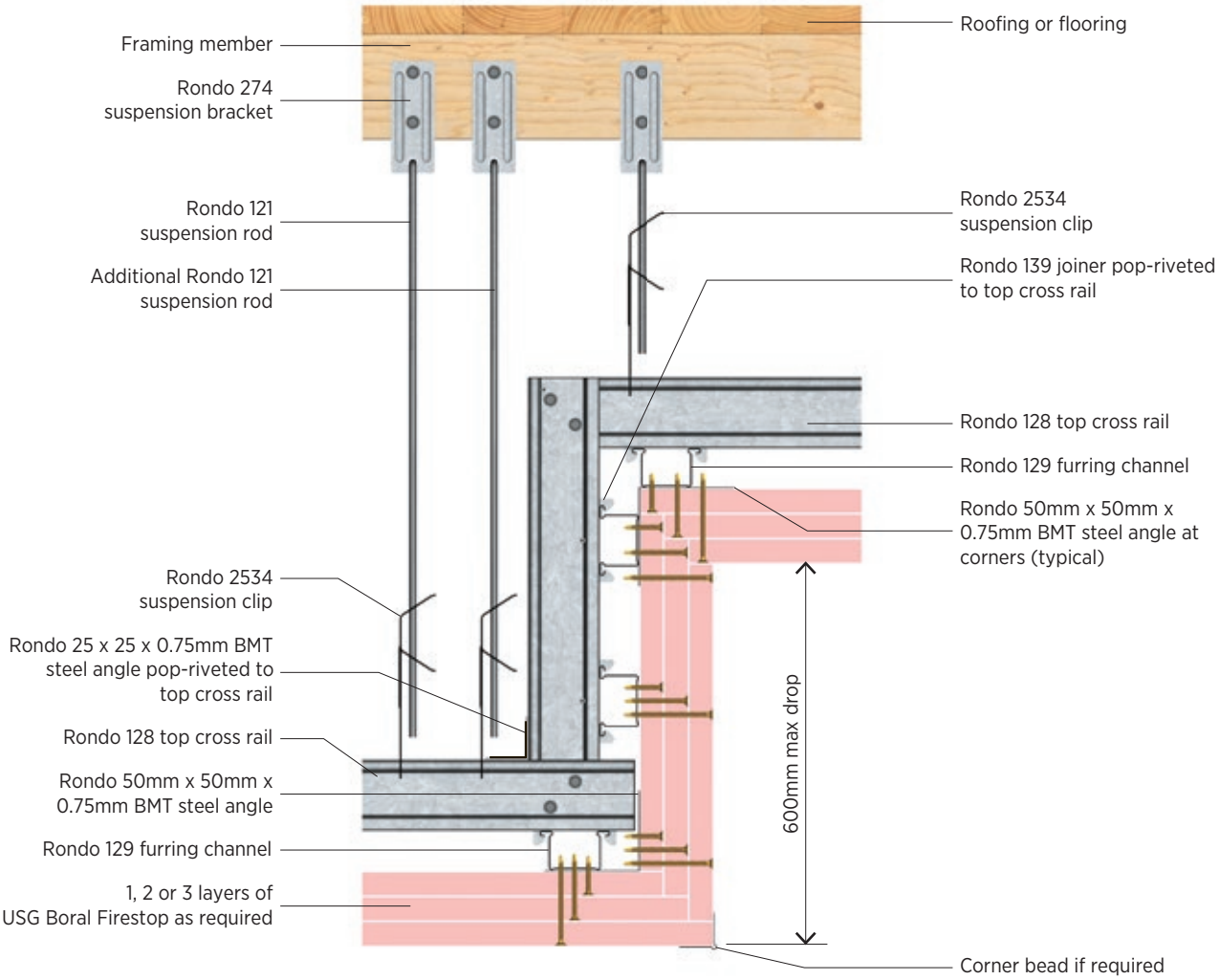


Figure 99: **Typical Bulkhead Detail**

» FIRE-RATED CEILINGS

MOVEMENT/CONTROL JOINTS

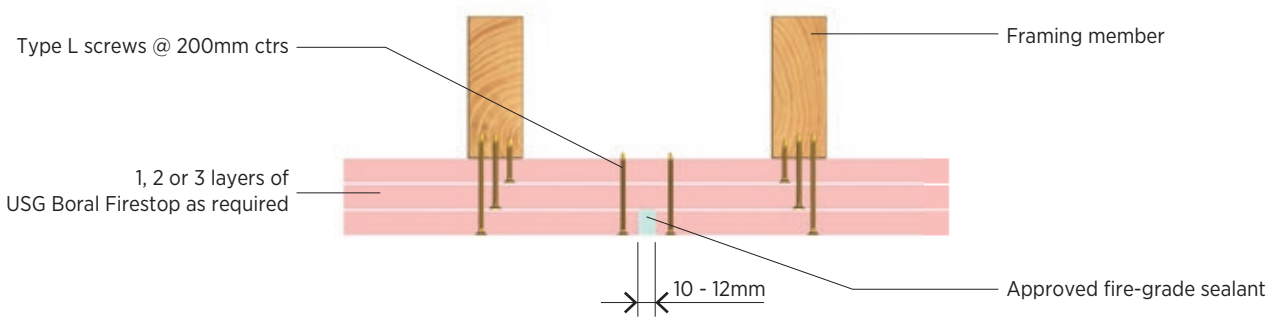


Figure 100: **Typical Universal Ceiling Control Joint Detail**

NOTES:

- Locate joint centrally between framing members when parallel to framing.
- Minimum of one layer of USG Boral Firestop plasterboard continuous over joint.
- Ensure single-layer system is back-blocked.

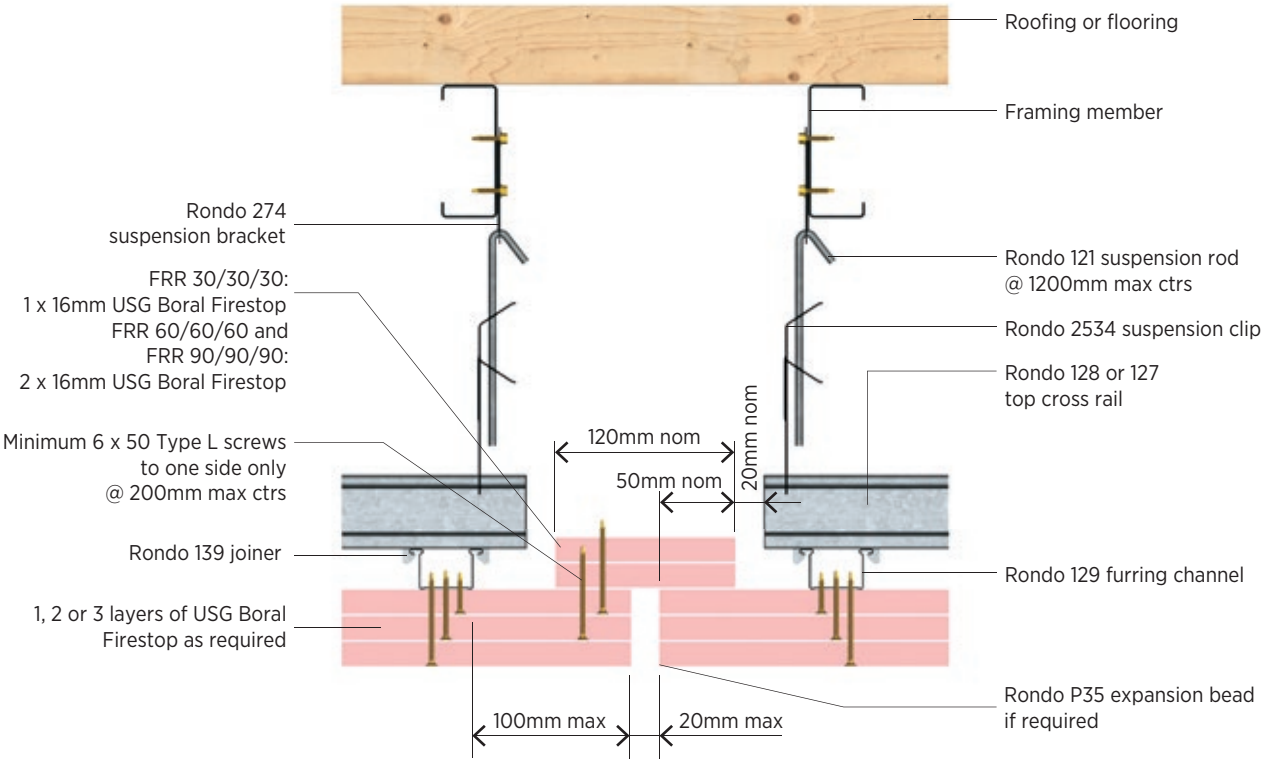


Figure 101: **Typical Movement Joint Detail**

» FIRE-RATED CEILINGS

LIGHTS

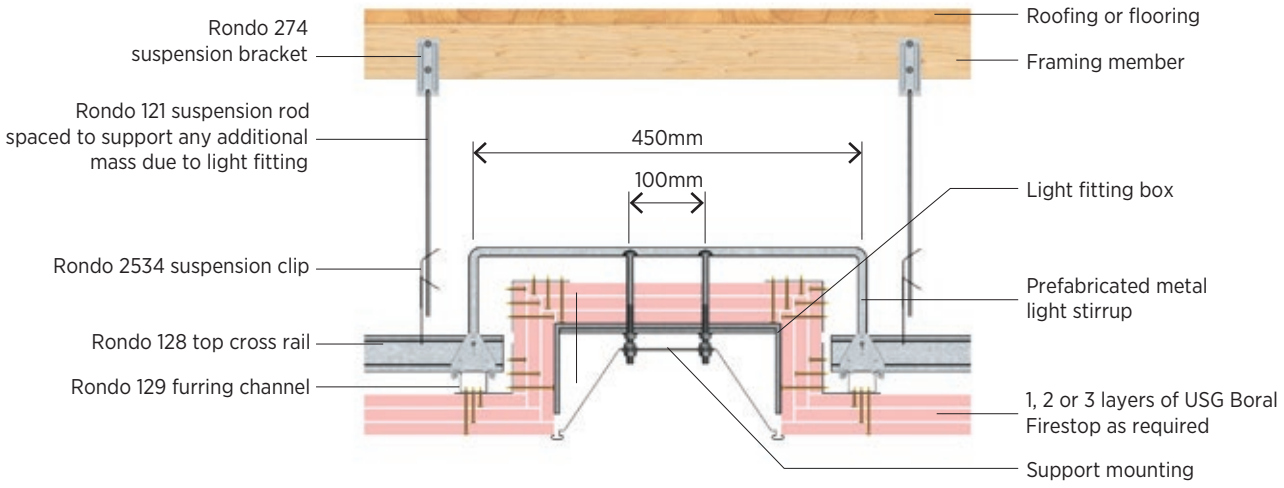


Figure 102: **Typical Light Recess Detail**

» FIRE-RATED CEILINGS

PLUMBING PENETRATIONS

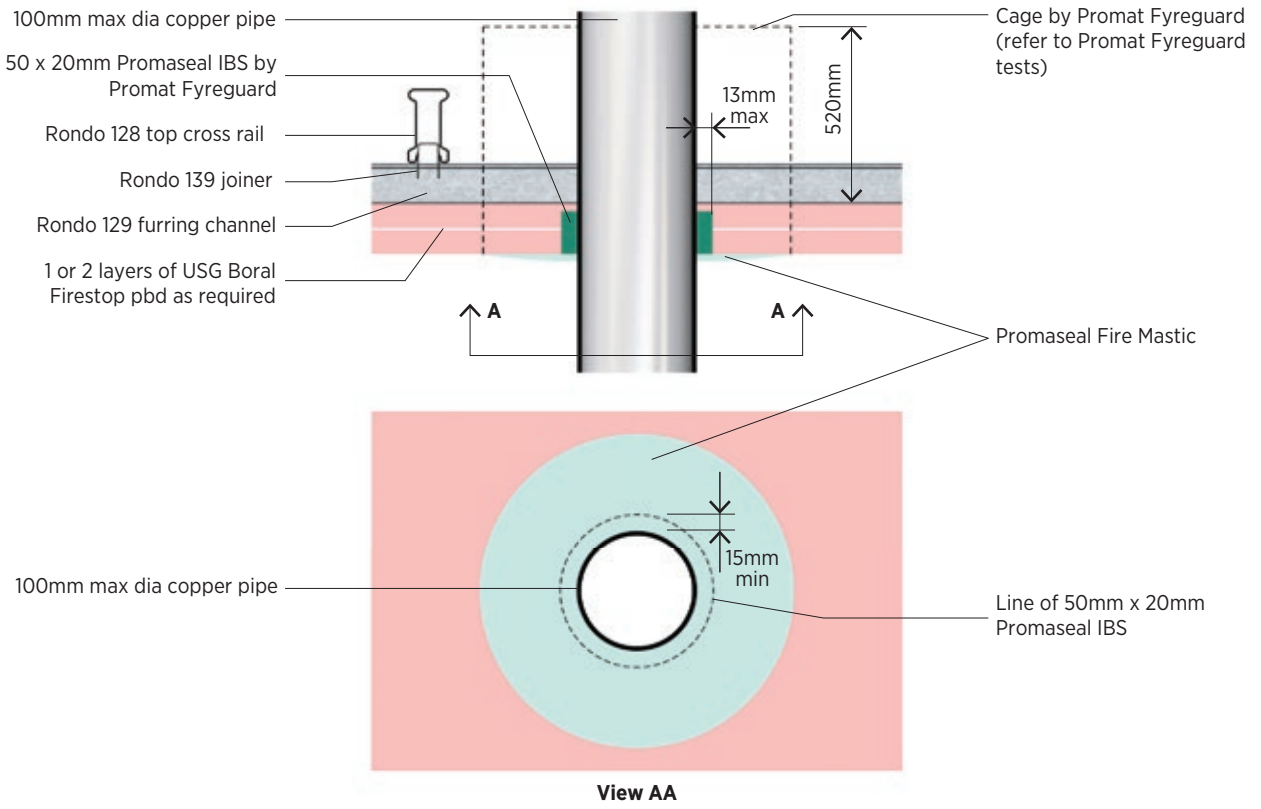


Figure 103: **Typical Copper Pipe Penetration – FRR 30/30/30 and FRR 60/60/60**

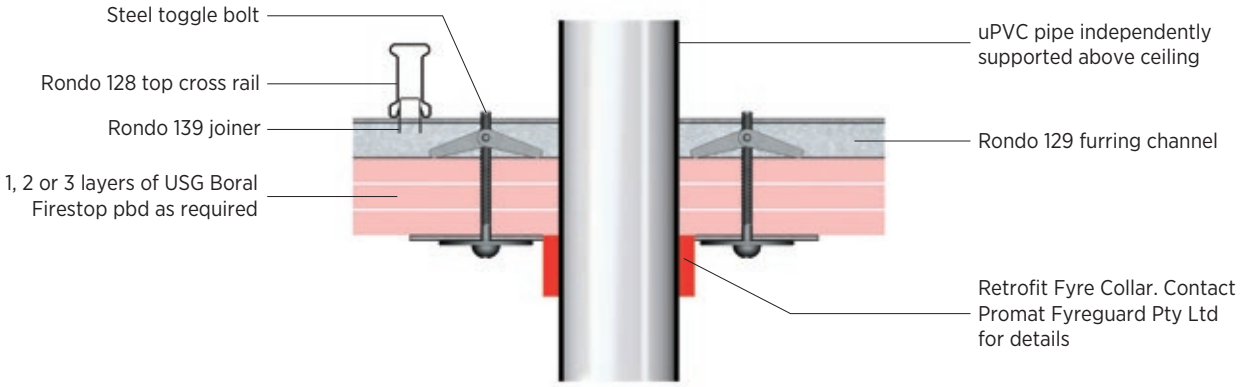


Figure 104: **Typical uPVC Pipe Penetration**

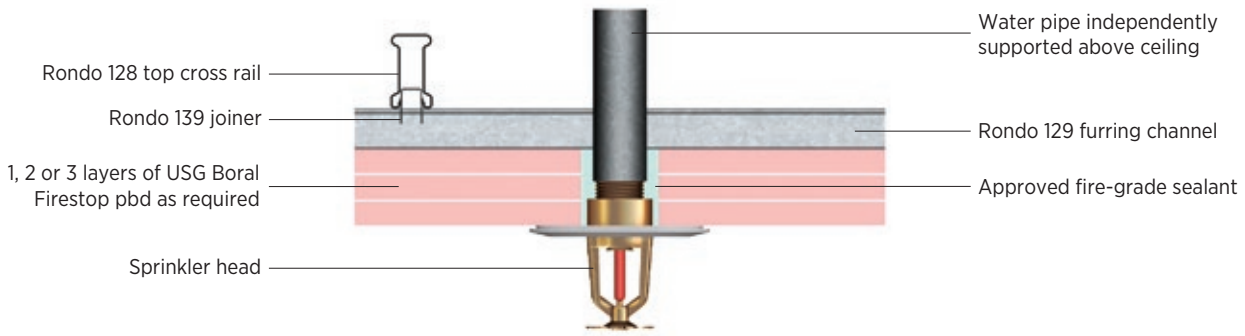


Figure 105: **Typical Sprinkler Pipe Penetration**

» FIRE-RATED CEILINGS

ELECTRICAL AND LOADED PENETRATIONS

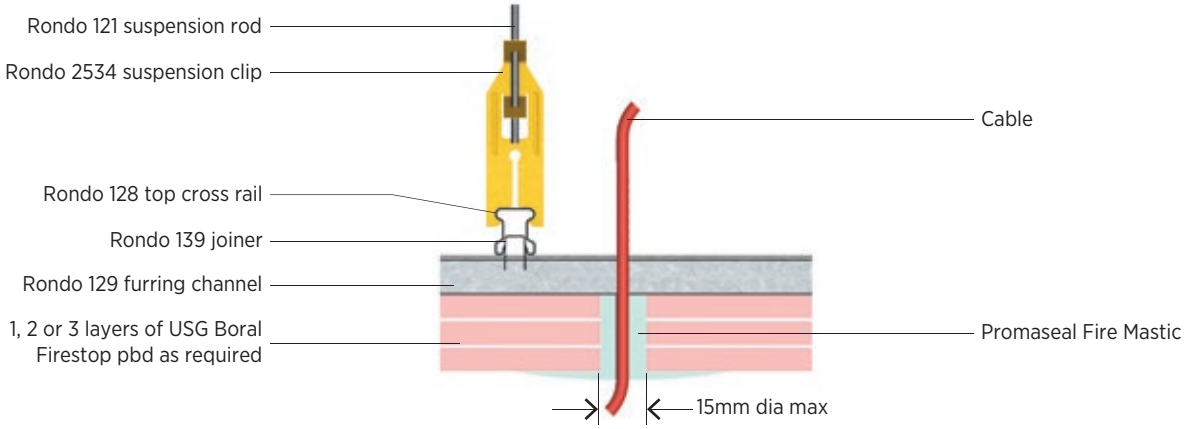


Figure 106: **Cable Penetration Detail**

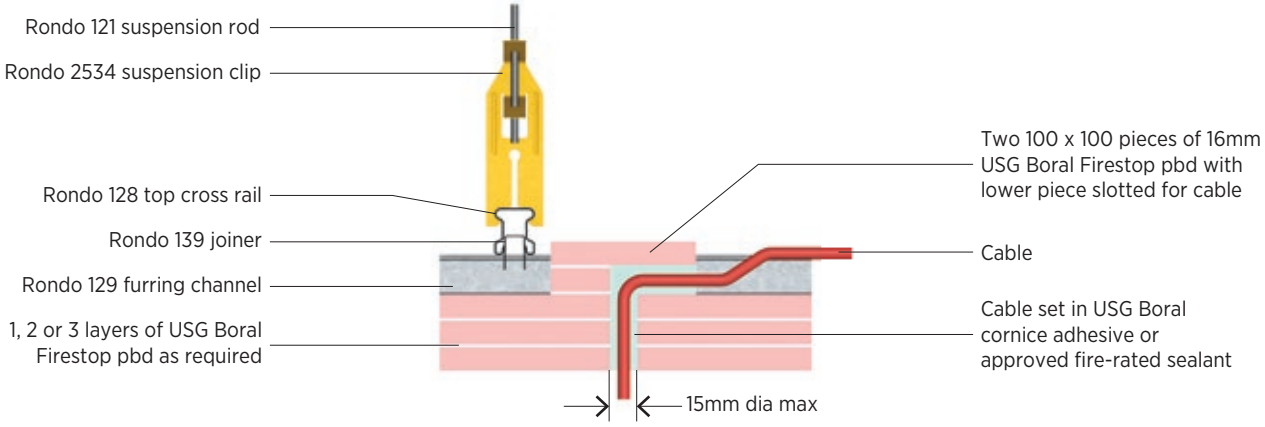


Figure 107: **Alternative Cable Penetration Detail**

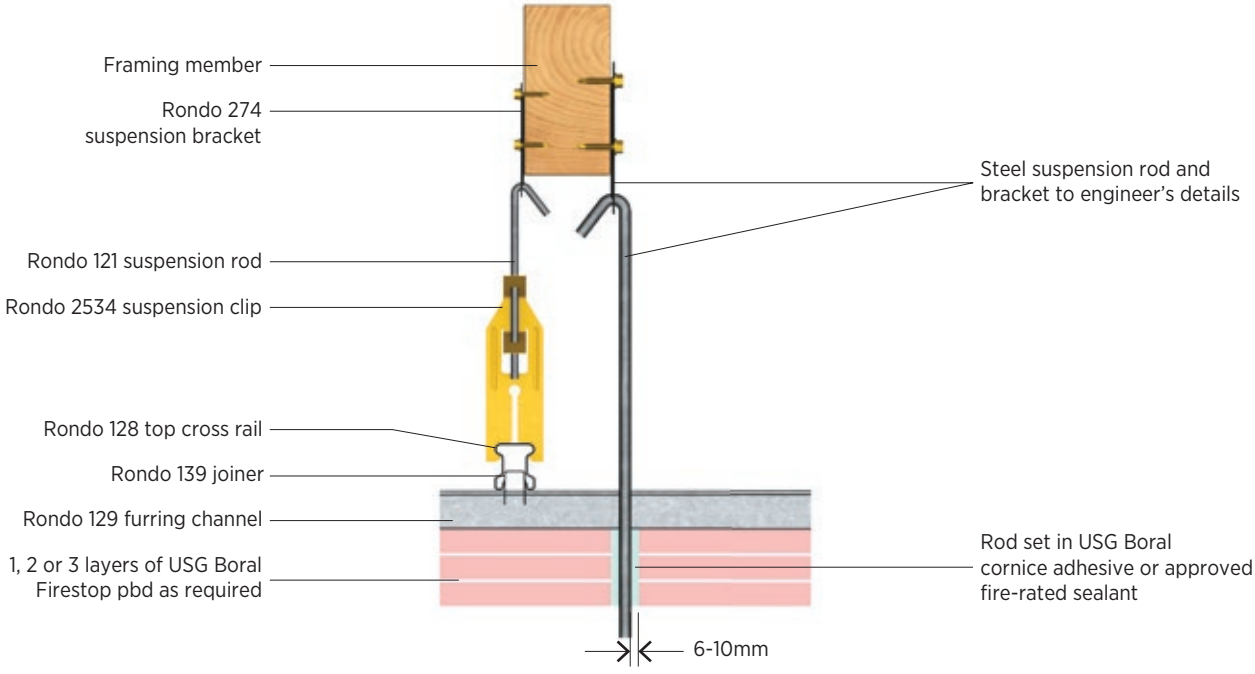


Figure 108: **Typical Loaded Penetration Detail**

» FIRE-RATED CEILINGS

BEAM PROTECTION

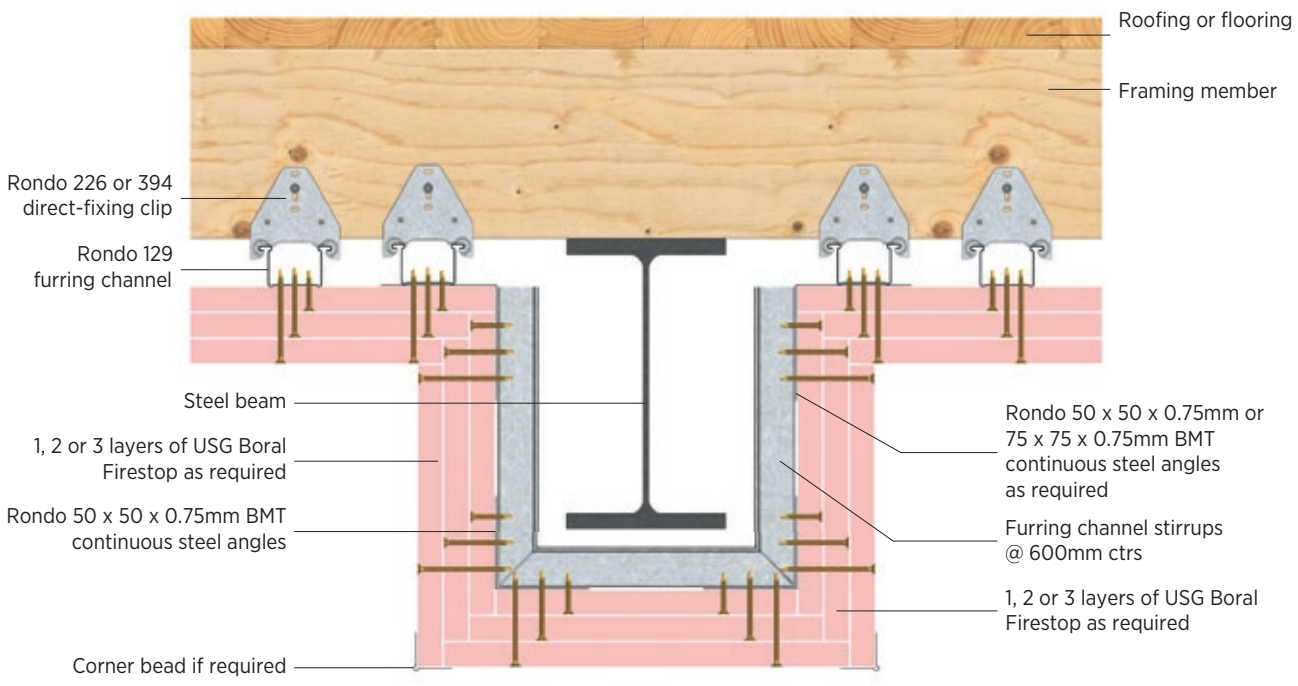


Figure 109: **Typical Steel Beam Protection Detail**

NOTE:

Vertical plasterboard fixed as per ceiling.

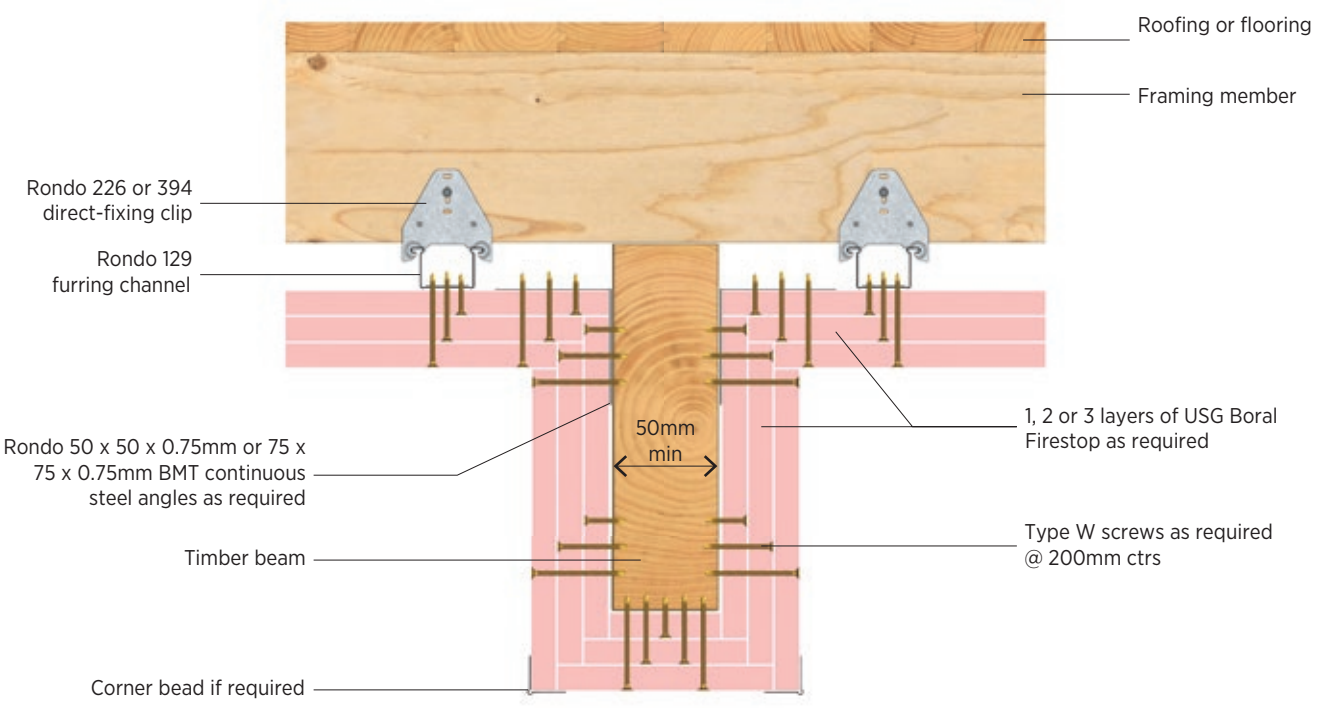


Figure 110: **Typical Timber Beam Protection Detail**

NON-FIRE-RATED CEILINGS

PERIMETER

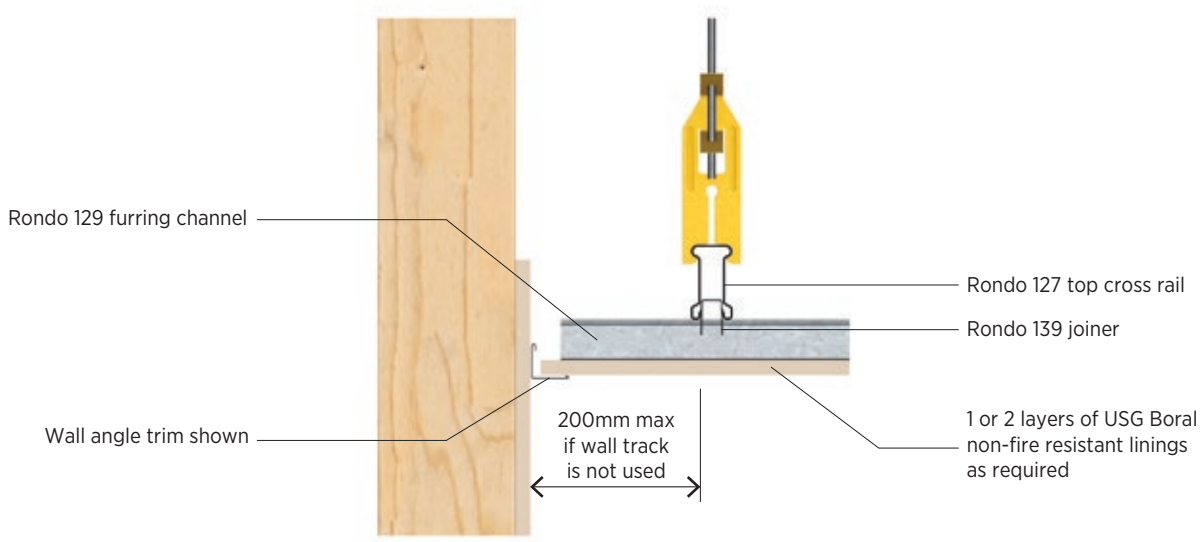


Figure 111: **Typical Perimeter Detail – Section Through Top Cross Rail**

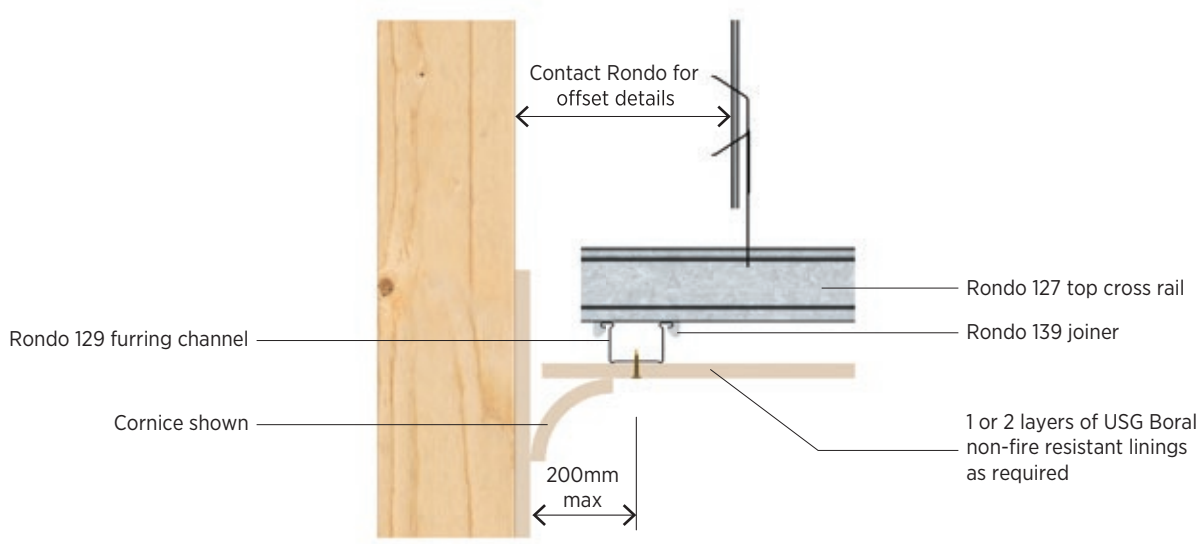


Figure 112: **Typical Perimeter Detail – Section Through Furring Channel**

» NON-FIRE-RATED CEILINGS

BULKHEADS

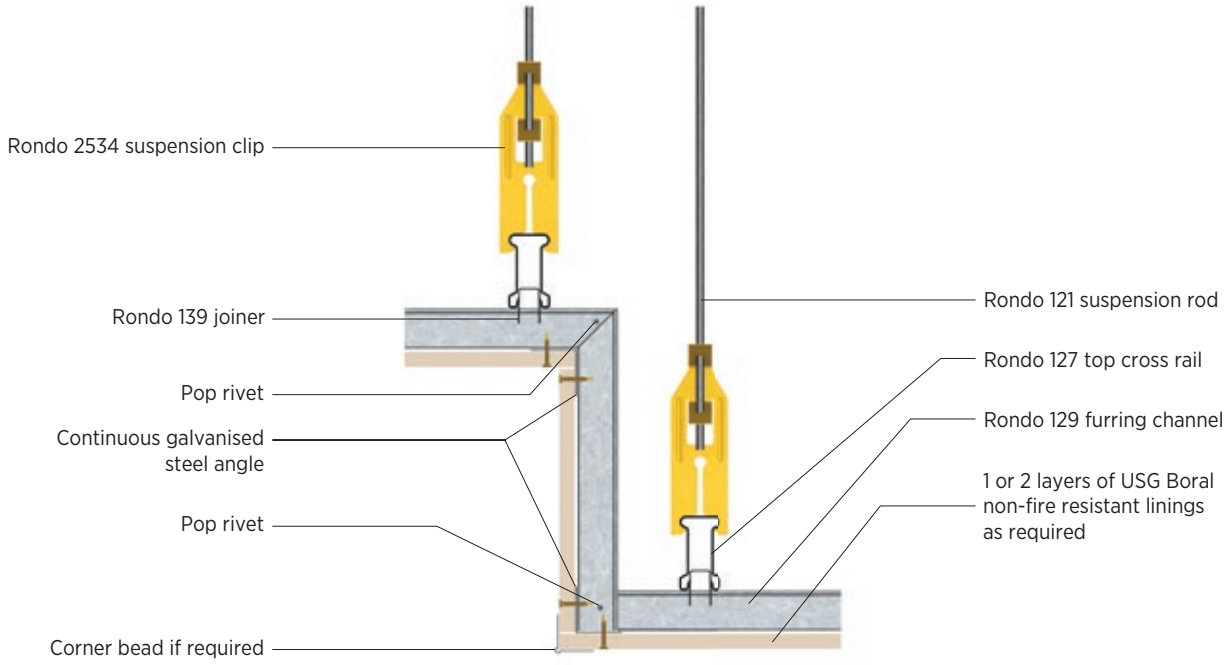


Figure 113: **Typical Bulkhead Detail – Section Through Top Cross Rail**

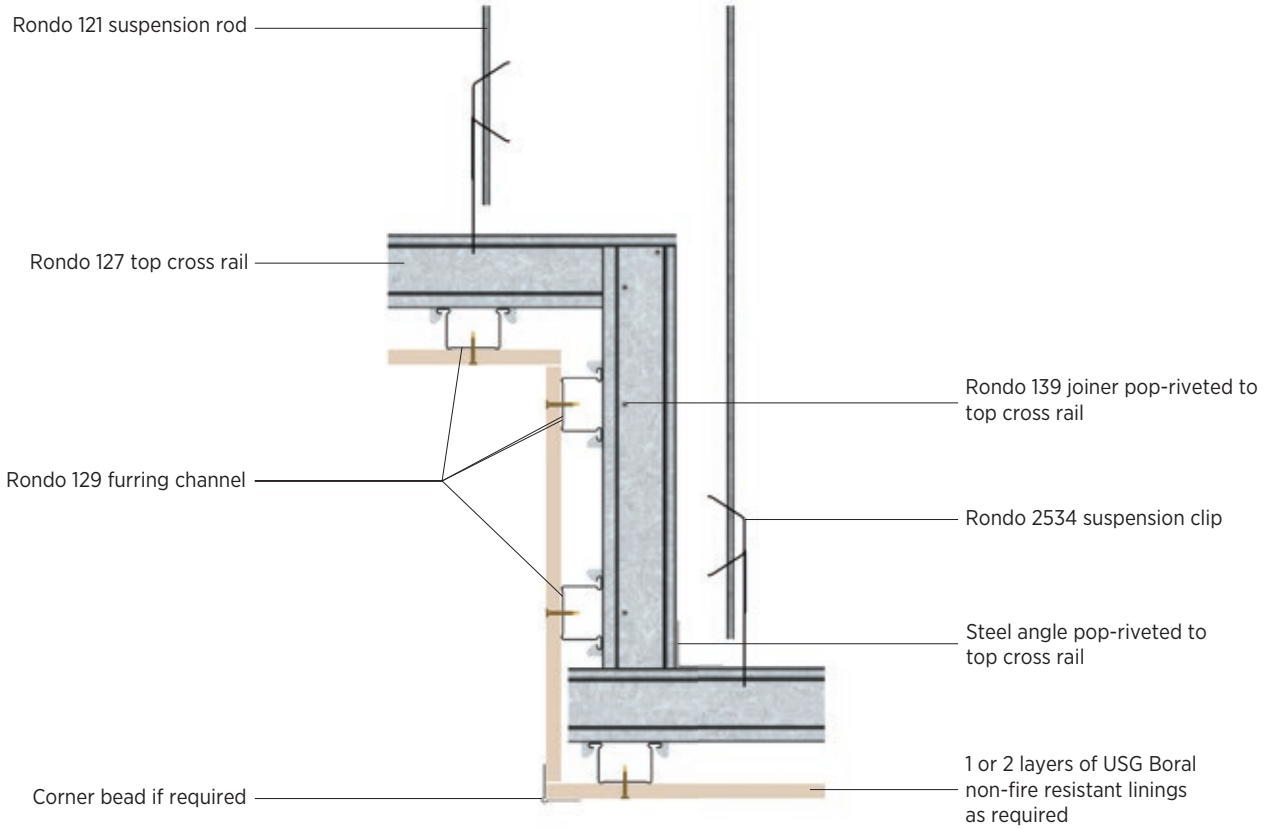


Figure 114: **Typical Bulkhead Detail – Section Through Furring Channel**

NOTES

INFORMATION

SUSTAINABILITY

USG Boral aims to minimise the environmental impact of its operations and to make a positive difference to the environment and communities in which it operates. Plasterboard is manufactured from abundant natural gypsum resources and 100% recycled paper liner.

HEALTH AND SAFETY

For information regarding the safe use of USG Boral Plasterboard products and accessories please refer to instructions on the product packaging or contact your local USG Boral Sales Office for a current copy of the Material Safety Data Sheet.

TECHNICAL ENQUIRIES 0800 USGBORAL

USG Boral provides technical advice to Builders, Architects, Contractors, Engineers, Regulators and Home Owners throughout New Zealand.

Our friendly team can offer both practical and design input at all levels of the plasterboard industry. Start your next project on the right track by contacting USG Boral weekdays
8.30am - 5.00pm on 0800 USGBORAL (0800 874 267).

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Systems+ technical information is intended to provide general information on plasterboard and associated products and should not be used as a substitute for professional building advice. There are many variables that can influence construction projects which affect whether a particular construction technique is appropriate. Before proceeding with any project we recommend you obtain professional advice to ascertain the appropriate construction techniques to suit the particular circumstances of your project having regard to the contents of this Installation Manual. We recommend you use qualified tradespersons to install systems referenced in the Systems+ manual. Illustrations in this guide are only representative of USG Boral plasterboard products and the appearance and effects that may be achieved by their use.

The technical information contained in this manual was correct at the time of printing. Building systems, details and product availability are subject to change. To ensure the information you are using is current, USG Boral recommends you review the latest building information available on the USG Boral website. For further information contact USG Boral.

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