

**GYPROCK®**

**THE  
RED  
BOOK™**

**03**

**COMMERCIAL & MULTI-RESIDENTIAL  
INSTALLATION GUIDE – CLASS 2-9 BUILDINGS**

**CSR**





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## Introduction

This guide provides detailed installation information for the fixing and jointing of Gyprock® plasterboard in commercial construction including wall, ceiling, column, beam and wet area applications. Commercial construction is intended to include non-residential structures such as offices, warehouses, schools, and hospitals, as well as medium and high-rise residential construction.

Information on fire, acoustic and other system performance properties can be found in Book 1 Design Guide – Fire, Acoustics and Thermal.

For technical support, contact DesignLINK, a dedicated team that assists designers and installers with commercial wall, ceiling and flooring system solutions. With expert advice garnered from years of industry experience, DesignLINK offers advice on system installation, design and performance. Call 1800 621 117 or email [designlink@csr.com.au](mailto:designlink@csr.com.au)

## Gyprock Plasterboard Product Manufacture

Gyprock plasterboard products are manufactured from gypsum, paper and a small amount of additives. Gypsum is a naturally occurring, non-toxic sedimentary rock. The paper liner board used for plasterboard and cornice is made from 100% recycled newspapers and cartons, and the additives are benign materials such as starch and foam.

The Gyprock range of plasterboard closely follows the plasterboard market split between Residential and Commercial applications. Each sector has two classifications:

- **Select Range** – Gyprock plasterboard products recommended for use in the majority of non-specialist wall and ceiling applications.
- **Specialty Options** – Gyprock plasterboard products for use in wall and ceiling systems where higher levels of performance are specified.

Plasterboard, or drywall as it is called in some parts of the world, is a machine made sheet comprised of a gypsum core wrapped in a heavy-duty liner paper.

The core is made by first mixing gypsum, a non-toxic sedimentary rock, with a foaming agent to create a wet plaster mix. This plaster is applied onto a sheet of thick paper and the side edges of the paper are wrapped around the plaster. Another sheet of linerboard paper is applied over the top to create a plaster sandwich which is cut to length and oven dried, ready for use. The final plasterboard sheet has two long edges that are paper-wrapped and two cut edges.

Gyprock manufactures in Australia to AS/NZS2588 – Gypsum plasterboard, and is formally accredited to the standard for Gyprock Plus, Supaceil and Standard Plasterboard 13mm.

In addition to standard plasterboard, Gyprock has developed technologies that deliver significant performance benefits to meet our customers' specific needs.

Gyprock Optimised Core technology delivers an advanced performance-to-weight ratio, providing greater breaking strength in a substantially lighter board. Optimised Core technology is currently available in Gyprock Plus and Supaceil.

While the majority of the plasterboard range is accredited by Good Environment Choice Australia, Gyprock also produces a handful of plasterboard products featuring higher levels of recycled content. This includes the Gyprock EC08 boards and Superchek, making these products a superior choice for Green Building projects.

Gyprock seeks to develop exclusive relationships with leading manufacturers throughout the world to deliver the best technologies and products to the Australian construction industry. Through the International Alliance program, Gyprock has delivered a number of high-performance gypsum board products to the market, that have been used extensively in commercial and residential projects.

### Good Environmental Choice Australia

In 2008, Gyprock was the first Australian manufacturer to deliver a plasterboard product certified by GECA. With continual development in the green building space, Gyprock now presents a range of fifteen accredited plasterboard products, and in 2014, was awarded GECA certification covering the majority of compounds in the range.



# Gyprock Plasterboard Selection

Gyprock plasterboard products are available in a large range of sheet lengths. Lengths vary by state, and a full list is available at [www.gyprock.com.au](http://www.gyprock.com.au). Standard width is 1200mm. Some products are also available in 900, 1350 and 1400mm widths (lead times may apply). Shaft Liner Panel is supplied in 600mm width only. Colour shading behind each product name approximates the colour of the product face liner sheet.

Table 1: Gyprock Plasterboard Features, Applications & Specifications


















GYPROCK® PLASTERBOARD	APPLICATIONS – WALLS & CEILINGS	THICK- NESS (mm)	MASS kg/m <sup>2</sup>	FIRE GRADE	MOISTURE RESISTANT	ENHANCED IMPACT RESISTANCE	ENHANCED SOUND RESISTANCE	ENHANCED SOUND ABSORPTION	MOULD RESISTANT	LOW VOC	GECA ACCREDITED
	FEATURES										
<b>Residential – Select Range</b>											
<b>Plus™</b>	<ul style="list-style-type: none"> <li>A 10mm thick sheet primarily designed for residential walls. Long edges are recessed to assist in producing a smooth, even and continuous surface once jointed.</li> <li>Made with Optimised Core technology that delivers an advanced performance-to-weight ratio, meaning greater breaking strength in a substantially lighter board that continues to exceed the performance requirements of AS/NZS2588.</li> <li>Optimised Core technology delivers improved handling and installed performance, as well as crisper score and snap.</li> </ul>	10	5.7							✓	
<b>Supaceil™</b>	<ul style="list-style-type: none"> <li>A 10mm thick sheet designed to span up to 600mm in ceiling applications. Can also be used for wall applications. Long edges are recessed to assist in producing a smooth, even and continuous surface once jointed.</li> <li>Made with Optimised Core technology that delivers an advanced performance-to-weight ratio, meaning greater breaking strength in a substantially lighter board that continues to exceed the performance requirements of AS/NZS2588.</li> <li>Optimised Core technology delivers improved handling and installed performance, as well as crisper score and snap.</li> </ul>	10	6.1 6.2 WA only							✓	
<b>Aquachek™</b>	<ul style="list-style-type: none"> <li>Both the core and linerboard facing are treated in manufacture to withstand the effects of moisture and high humidity.</li> <li>Recessed long edges allow flush jointing to other Recessed Edge plasterboard types.</li> </ul>	10	7.9		✓					✓	
<b>Residential – Specialty Options</b>											
<b>Superchek™</b>	<ul style="list-style-type: none"> <li>Manufactured with a very dense core and heavy duty facing producing high impact and sound resistance,</li> <li>Will span 600mm in ceiling applications.</li> <li>Double the force to impose a discernible surface indentation compared to standard plasterboard.</li> <li>Walls lined with Superchek provide a clearly noticeable reduction in perceived loudness compared to standard plasterboard.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	10	10.4			✓	✓			✓	
<b>Commercial – Select Range</b>											
<b>Standard Plasterboard</b>	<p>RE – Recessed Edge</p> <ul style="list-style-type: none"> <li>Long edges are recessed to assist in producing a smooth, even and continuous surface once jointed.</li> </ul> <p>RE/SE – 1 Recessed Edge, 1 Square Edge</p> <ul style="list-style-type: none"> <li>Typically used on walls with a single horizontal joint. One long edge is recessed to assist in producing a smooth, even and continuous surface once jointed.</li> <li>One long edge is square to enable easy fixing of skirting and cornice at the top and bottom of walls.</li> </ul> <p>SE – 2 Square Edges</p> <ul style="list-style-type: none"> <li>Long edges are square, and can be butted together without jointing, or covered with aluminium, timber or vinyl mouldings.</li> </ul>	13	8.5							✓	
<b>Aquachek™</b>	<ul style="list-style-type: none"> <li>Refer to Residential Select Range for details.</li> </ul>	13	9.8		✓					✓	
<b>Soundchek™</b>	<ul style="list-style-type: none"> <li>Designed to provide enhanced acoustic resistance.</li> <li>A machine made sheet composed of a high density gypsum core encased in a heavy duty linerboard.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	13.0				✓			✓	

Table 1: Gyprock Plasterboard Features, Applications &amp; Specifications

GYPROCK® PLASTERBOARD	APPLICATIONS – WALLS & CEILINGS	THICK- NESS (mm)	MASS kg/m <sup>2</sup>	FIRE GRADE	MOISTURE RESISTANT	ENHANCED IMPACT RESISTANCE	ENHANCED SOUND RESISTANCE	ENHANCED SOUND ABSORPTION	MOULD RESISTANT	LOW VOC	GECA ACCREDITED
	FEATURES										
<b>Impactchek™</b>	<ul style="list-style-type: none"> <li>Fire grade board reinforced with a woven fibreglass mesh to produce a high strength plasterboard which resists soft body impact damage.</li> <li>Ideal for high traffic areas such as hallways, stairways, playrooms and garages.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	10.5	✓		✓	✓			✓	
<b>Fyrchek™</b>	<ul style="list-style-type: none"> <li>Fire grade board composed of a specially processed glass fibre reinforced gypsum core encased in a heavy duty linerboard.</li> <li>Ideal for high performance fire and acoustic rated walls and ceilings.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	10.5	✓			✓			✓	
		16	12.5								
<b>Fyrchek™ MR</b>	<ul style="list-style-type: none"> <li>Fire grade board with moisture resistant properties.</li> <li>Both the core and the liner board are treated in manufacture to withstand the effects of high humidity and moisture.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	10.8	✓	✓	✓				✓	
		16	12.9								
<b>Commercial – Specialty Options</b>											
<b>EC08™ Impact</b>	<ul style="list-style-type: none"> <li>This product features higher levels of recycled content, making it a superior choice for Green Building projects.</li> <li>EC08 Impact is a fire grade board offering increased density for greater resistance to soft and hard body impact for high traffic areas such as hallways and stairs in education and health facilities.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	12.1	✓		✓	✓			✓	 
<b>EC08™ Impact MR</b>	<ul style="list-style-type: none"> <li>This product features higher levels of recycled content, making it a superior choice for Green Building projects.</li> <li>A fire grade board specially treated for wet area/high humidity locations subject to increased impact risk, such as bathrooms, kitchens, laundries, walkways for hospitals, aged care, educational and commercial buildings.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	12.4	✓	✓	✓	✓			✓	 
<b>EC08™ Complete</b>	<ul style="list-style-type: none"> <li>This product features higher levels of recycled content, making it a superior choice for Green Building projects.</li> <li>Gyprock EC08 Complete is a premium internal lining solution which integrates an efficient mould inhibitor, scuff resistance, soft and hard body impact resistance, moisture resistance, sound resistance and fire resistance into a low VOC plasterboard.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	12.4	✓	✓	✓	✓	✓	✓	✓	 
		16	14.8								
<b>Shaft Liner Panel</b>	<ul style="list-style-type: none"> <li>Fire grade board used extensively in Gyprock shaft systems, services systems, party wall and intertenancy wall applications.</li> <li>A 25mm thick sheet composed of a glass fibre reinforced gypsum core encased in a heavy duty linerboard.</li> <li>600mm wide square edge sheets.</li> </ul>	25	19.8	✓			✓			✓	
<b>Shaft Liner Panel MP</b>	<ul style="list-style-type: none"> <li>Fire grade board with antifungal additives to resist mould formation.</li> <li>A 25mm thick sheet composed of a glass fibre reinforced gypsum core encased in a heavy duty ivory linerboard.</li> <li>600mm wide square edge sheets.</li> </ul>	25	19.8	✓			✓		✓	✓	
<b>Flexible</b>	<ul style="list-style-type: none"> <li>A 6.5mm thick plasterboard with an enhanced core to allow bending to small radii for curved walls and ceilings.</li> <li>Designed for installation as a two layer system.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	6.5	4.3							✓	
<b>Glasroc F</b>	<ul style="list-style-type: none"> <li>A 30mm thick paperless gypsum board with glass fibre reinforced core.</li> <li>Designed for single-layer installation, without jointing, to provide fire protection to structural steel columns and beams.</li> <li>1200mm wide square edge boards.</li> </ul>	30	25.5	✓		✓					

# Gyprock Perforated Plasterboard Selection

Excellence in design is achieved with a balance of aesthetics and functional performance. The Gyprock range of perforated plasterboard and access panels allows architects and designers to create beautiful ceilings and walls that achieve high levels of acoustic performance.

The perforations together with fleece linings and insulation where used, reduce echo and noise reverberation to create more comfortable environments for work and leisure. For pattern layouts, visit [gyprock.com.au](http://gyprock.com.au).

Table 2: Gyprock Perforated Plasterboard Features, Applications & Specifications


GYPROCK PERFORATED PLASTERBOARD	APPLICATIONS – WALLS & CEILINGS	THICKNESS	MASS	FIRE GRADE	MOISTURE RESISTANT	ENHANCED IMPACT RESISTANCE	ENHANCED SOUND RESISTANCE	ENHANCED SOUND ABSORPTION	MOULD RESISTANT	LOW VOC	GECA ACCREDITED
	FEATURES	(mm)	kg/m <sup>2</sup>								
<b>Gyprock Standard Range</b>											
<b>Standard Perforated 6mm Round</b>	<ul style="list-style-type: none"> <li>Featuring six large rectangular groupings per sheet, each with 2,100 x 6mm diameter perforations at 15mm centres to provide an open area of 8.3%.</li> <li>Long edges are recessed for flush jointing.</li> </ul>	13	7.8					✓		✓	
<b>Gyptone Range</b>											
<b>Gyptone 12mm Square</b>	<ul style="list-style-type: none"> <li>Featuring eight large square groupings per sheet, each with 400 x 12mm square perforations at 25mm centres, providing a 16% open area.</li> <li>Supplied with either black or white acoustic fabric backing.</li> <li>Manufactured with patented Activ'Air technology, which removes formaldehyde and improves the environment for people working and living in the space.</li> <li>All four edges are recessed for flush jointing.</li> <li>Matching access panel available.</li> </ul>	12.5	8.3					✓		✓	
<b>Gyptone 12mm Square Minigrid</b>	<ul style="list-style-type: none"> <li>Featuring eight large square groupings per sheet, each with nine mini grids of 16 x 12mm square perforations at 25mm centres. This subtle pattern provides an open area of 6%.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Manufactured with patented Activ'Air technology, which removes formaldehyde and improves the environment for people working and living in the space.</li> <li>All four edges are recessed for flush jointing.</li> <li>Matching access panel available.</li> </ul>	12.5	8.4					✓		✓	
<b>Gyptone Slotted Minigrid</b>	<ul style="list-style-type: none"> <li>Featuring eight large square groupings per sheet, each with 16 mini grids of six 6mm x 80mm slot perforations. This contemporary design provides 13% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Manufactured with patented Activ'Air technology, which removes formaldehyde and improves the environment for people working and living in the space.</li> <li>All four edges are recessed for flush jointing.</li> <li>Matching access panel available.</li> </ul>	12.5	8.6					✓		✓	
<b>Gyptone Flexible 12mm Square</b>	<ul style="list-style-type: none"> <li>Flexible board suitable for curving to 1.2m minimum radius.</li> <li>Perforated gypsum board with square holes of 12mm x 12mm.</li> <li>Total perforated area of 16%.</li> <li>Supplied with black acoustic fabric backing.</li> </ul>	6.5	6.5					✓		✓	
<b>Gyptone Flexible Slotted Minigrid</b>	<ul style="list-style-type: none"> <li>Flexible board suitable for curving to 1.2m minimum radius.</li> <li>Perforated gypsum board with rectangular holes of 6mm x 80mm.</li> <li>Total perforated area of 13%.</li> <li>Supplied with black acoustic fabric backing.</li> </ul>	6.5	6.5					✓		✓	

Table 2: Gyprock Perforated Plasterboard Features, Applications &amp; Specifications

GYPROCK PERFORATED PLASTERBOARD	APPLICATIONS – WALLS & CEILINGS	THICKNESS (mm)	MASS kg/m <sup>2</sup>	FIRE GRADE	MOISTURE RESISTANT	ENHANCED IMPACT RESISTANCE	ENHANCED SOUND RESISTANCE	ENHANCED SOUND ABSORPTION	MOULD RESISTANT	LOW VOC	GECA ACCREDITED
	FEATURES										
<b>Rigitone Range</b>											
<b>Rigitone Matrix 8mm Round</b>	<ul style="list-style-type: none"> <li>Featuring a grid pattern of 8mm round perforations spaced at 18mm centres, providing a 15.5% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> </ul>	12.5	10.0					✓		✓	
<b>Rigitone Matrix 12mm Square</b>	<ul style="list-style-type: none"> <li>Featuring a grid pattern of 12mm square perforations spaced at 25mm centres, providing a 23% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> </ul>	12.5	9.5					✓		✓	
<b>Rigitone Astral</b>	<ul style="list-style-type: none"> <li>Featuring a regularly staggered pattern consisting of 12mm and 20mm round perforations spaced at 33mm centres, providing a 19.6% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> </ul>	12.5	9.5					✓		✓	
<b>Rigitone Galaxy</b>	<ul style="list-style-type: none"> <li>Featuring an irregular scattered pattern consisting of 8mm, 15mm and 20mm round perforations, providing a 10% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> </ul>	12.5	10.0					✓		✓	

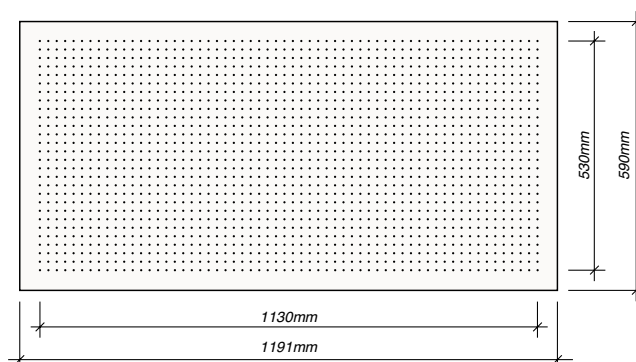
## Gyprock Ceiling Tiles Selection

CSR Gyprock offers a range of plasterboard ceiling tiles for exposed grid ceiling systems, to suit a variety of commercial applications.

Table 3: Gyprock Ceiling Tile Features, Applications &amp; Specifications

GYPROCK CEILING TILES	APPLICATIONS – GRID CEILING SYSTEMS	THICKNESS (mm)	MASS kg/m <sup>2</sup>
	FEATURES		
<b>Supatone™</b>	Gyprock Supatone is a plasterboard tile with a wipe clean smooth polycoated surface paper laminate. Supatone is available in white, and used in basic commercial ceiling applications. Supatone's core features the sag resistance properties of Supaceil. 1200 x 600mm nom.	10	7.0
<b>Freshtone™ Diamond White</b>	Freshtone is a Gyprock plasterboard tile finished with a finely textured vinyl laminate which resists fading and is easily wiped clean. Freshtone is available in white, and is ideal for shopping centres, offices and industrial premises. Freshtone's core features the sag resistance properties of Supaceil. 1200 x 600mm nom.	10	8.0
<b>Perforated Tile</b>	Gyprock Perforated Tiles have been specifically developed for use in ceilings where additional sound absorption is required. Perforations are approximately 10% of the tile area, and combined with suitable insulation, provide a medium level of acoustic absorption. 1200 x 600mm nom.	13	10.0

Figure 1: Gyprock Perforated Ceiling Tile (All Dimension Nominal)



## Himmel Ceiling Tile Selection

CSR Himmel offers a range of plasterboard ceiling tiles for exposed grid ceiling systems, each with various surface finishes and different properties to suit a variety of commercial applications. For more information please contact the Himmel team on 1300 374 253 or visit [www.himmel.com.au](http://www.himmel.com.au).

Table 4: Ceiling Tile Features, Applications & Specifications

OWA & ECOPHON CEILING TILES	APPLICATIONS – GRID CEILING SYSTEMS	THICKNESS (mm)	MASS kg/m <sup>2</sup>
	FEATURES		
<b>OWA Alto</b>	<ul style="list-style-type: none"> <li>A mineral fibre ceiling tile that offers high acoustic properties and a traditional fissured face pattern.</li> <li>Suitable for many commercial applications such as offices and education projects.</li> <li>Available in a variety of sizes and edge details.</li> </ul>	15	4.5
<b>OWA Finetta</b>	<ul style="list-style-type: none"> <li>A mineral fibre ceiling tile that offers good acoustic properties and a pinhole face pattern.</li> <li>Perfect for commercial projects where acoustics are essential to the environment.</li> <li>Available in a variety of sizes and edge details.</li> </ul>	15	4.5
<b>OWA New Sandila</b>	<ul style="list-style-type: none"> <li>A mineral fibre ceiling tile that offers good premium acoustic properties and durable face pattern.</li> <li>Ideal for commercial applications with large noisy areas such as classrooms, retail spaces and hotels.</li> </ul>	15	4.5
<b>OWA Sinfonia Privacy</b>	<ul style="list-style-type: none"> <li>A mineral fibre ceiling tile that offers premium acoustic properties and a modern, clean face pattern.</li> <li>Perfect for commercial projects such as healthcare and retail where design and acoustics are essential.</li> <li>Available in white, grey and black, and in a variety of sizes and edge details.</li> </ul>	20	4.9
<b>OWA Brillianto A</b>	<ul style="list-style-type: none"> <li>A premium acoustic ceiling tile that offers high acoustic properties and a clean white face pattern.</li> <li>Perfect for general commercial spaces such as hallways and open plan office spaces.</li> </ul>	15/19	4.2

## Gyprock Cornice Selection

Gyprock Cornice is designed to provide an attractive finish at the junction of the wall and ceiling. It can be used on Gyprock plasterboard, fibrous plaster, fibre cement or cement rendered surfaces. Gyprock cornice is composed of gypsum plaster encased in a strong linerboard. Refer to the Flush Jointed Ceiling Systems section for additional information.

Table 5: Gyprock Cornice Range

GYPROCK CORNICE	APPLICATIONS – CEILING SYSTEMS
	FEATURES
<b>Cove</b>	<p><b>Standard</b></p> <p>Gyprock Cove has long been the standard cornice choice for Australian home builders. Its functional profile does not detract from common décor styles and it is available in three profile sizes (55, 75 &amp; 90mm) to suit different ceiling heights and applications.</p>
<b>Aria™ Duo Presto</b>	<p><b>Contemporary</b></p> <p>If the property style calls for something more modern and streamlined than Cove, the Gyprock Contemporary range offers minimalistic profiles that will add interest with simple, fresh appeal.</p>
<b>Alto™ Trio Tempo™ Concerto™ Symphony</b>	<p><b>Inspirations</b></p> <p>A Gyprock Inspirations cornice gives a new dimension of style and detail. Whether traditional or modern in style, each has a unique and distinctive look that can add quality and value to the project.</p>



## Referenced Material

The following Standards and handbooks are referenced in this guide.

### Manufacturing Standards:

- AS/NZS 2588 Gypsum Plasterboard.
- AS/NZS 2908.2 – Cellulose-cement products – Flat sheet.

### Other referenced Standards and handbooks:

- AS/NZS 1170 series – Structural design actions.
- AS 1530.4 – Fire resistance tests for elements of construction.
- AS 1684 series – Residential timber framed construction.
- AS 1720.1 – Timber structures.
- AS/NZS 2311 – The painting of buildings.
- AS/NZS 2358 Adhesives for fixing ceramic tiles.
- AS/NZS 2589 Gypsum linings – Application and finishing.
- AS/NZS 2785 Suspended ceilings - design and installation.
- AS/NZS 3000 – Electrical installations.
- AS 3600 – Concrete Structures.
- AS/NZS 3700 Masonry structures.
- AS 3740 Waterproofing of wet areas within residential buildings.
- AS 3958.1 – Guide to the installation of ceramic tiles.
- AS 3959 Construction of buildings in bushfire-prone areas.
- AS 4055 Wind loads for housing.
- AS/NZS 4200.1 – Pliable building membranes and underlays – Materials.
- AS 4200.2 – Pliable building membranes and underlays – Installation requirements.
- AS/NZS 4600 – Cold formed steel structures.
- AS/NZS 4858 – Wet area membranes.
- AS/NZS 4859.1 – Material for the thermal insulation of buildings – General criteria and technical provisions.
- AS 5216 – Design of post-installed and cast-in fastenings in concrete.
- AS/NZS 5601 – Gas installations.
- AS 5637.1 – Determination of fire hazard properties.
- AS/ISO 13007 – Ceramic tiles – grouts and adhesives.
- Building Code of Australia (BCA).
- ICANZ Insulation Handbook Part 1: Thermal Performance – Version 3.
- NASH Standards – Residential and Low-rise Steel Framing, Part 1 and Part 2.
- SAHB39 - Installation code for metal roofing and wall cladding.

## Design & Installation Considerations

Gyprock plasterboard is used as an internal lining board to provide smooth, strong, long-lasting walls and ceilings for homes, offices, hospitals, hostels for the aged, schools, shops and factories. Its durable surface will accept most types of decorative finishing, including paint, wallpaper, texture compounds and tiles.

Joints between Gyprock plasterboard sheets are reinforced and concealed to provide a smooth, durable finish to the whole surface. Alternatively, the joints may be covered with a decorative moulding or finished as expressed joints.

### Condensation Control

Gyprock plasterboard will give many years of satisfactory performance under a wide range of climatic conditions, but to ensure long term performance to both lining material and paint finishes, care should be taken in design of the external envelope to ensure that damaging effects of condensation and mould formation do not occur.

Mould can grow on most surfaces in the presence of warm moist air, dust, and organic particles.

Plasterboard liner contains cellulose fibres which may be subject to surface mould attack if left unpainted or sealed, for example during construction or in damp cavities. The risk of damage can be reduced by selecting mould resistant products such as Shaft Liner Panel MP or EC08 Complete, and/or by using mould resistant paint.

Condensation within a building is the result of a temperature difference from one side of a building element to the other. The temperature differential forces water vapour contained in the warmer air to flow towards the cooler region where it condenses on any surface below the dew point temperature of the air.

For walls and ceilings, vapour barriers are incorporated into the structure to prevent the flow of water vapour from the warm to the cool regions. As a general rule, locate the vapour barrier as close as possible to the surface which will normally be at the higher temperature at the time of the condensation hazard.

For ceilings, unheated roof spaces should be adequately ventilated. Ventilation solutions are available from Edmonds, part of the Bradford Insulation Group. In rooms such as bathrooms, kitchens, and laundries, moisture laden air should be exhausted to the outside of the building, not to the roof or floor space.

Condensation is a complex problem and can occur under a variety of conditions, not just in cold and tropical climates. There are a large number of factors that need to be considered in assessing and managing condensation risk. Such factors include the local climate, building use, orientation, material R-Value of the insulation and the type of bulk insulation, position and integrity of vapour barriers/vapour permeable membranes, and the degree and location of ventilation. As a result, it is highly



recommended that designers undertake a condensation risk analysis as part of the building design.

Additional literature on this subject is available from CSIRO, BRANZ, ASHRAE and ABCB, and should be consulted.

## Structural Design

All linings and framing are to be designed for all appropriate loads. Guidance for the selection of wall framing elements and for plasterboard linings subjected to a range of lateral pressures is provided in this manual. For the structural design of other elements or load cases, the manufacturer or appropriate professional should be consulted.

## Heating

The following situations may give rise to localised high temperature conditions ( $\geq 52^\circ$ ) which may be detrimental to wall and ceiling linings:

- Radiant heaters,
- Halogen lighting,
- Heat pumps,
- Reverse cycle air conditioners,
- Solid fuel stoves.

Recessed lights must be installed in a way which prevents damage from temperature rise and to prevent the risk of fire. Refer to AS/NZS3000.

Refer to heating unit manufacturer for more information.

## Gas Services & Appliances

Where a gas stove in a residential or commercial application is required to be installed to AS/NZS5601 Gas Installations, there are requirements for materials to protect surrounding construction.

In residential applications, where a burner is within 200mm of a wall, protection methods include:

- A splashback attached to the stove intended to protect the rear wall.
- 12mm fibre cement lining covered with 0.4mm steel sheet.
- 5mm ceramic tiles attached to 10mm plasterboard or 6mm fibre cement lining.
- 5mm toughened glass attached to 10mm plasterboard or 6mm fibre cement lining.

Note that Gyprock plasterboards and Cemintel fibre cement products do not meet the code definition of fire resistant material.

## Attaching Fixtures

For non-fire rated walls, light weight fixtures such as picture frames may be attached to the plasterboard with proprietary fixings. Check with the fixing manufacturer for allowable loadings.

Heavier loads such as shelves and appliances must be fixed through the linings to the framing, such as studs or noggings.

For fire rated walls, fixtures such as handrails and other lightweight items may be attached to framing, such as studs or noggings with maximum 10g screws. Refer to 'Attachments & Access Panels' on page 99 For the use of proprietary fixings in fire rated walls, refer to the manufacturers' details.

## Control Joints

Movement and stresses created by temperature and humidity fluctuation, can result in deformation and damage to internal linings and partitions.

It is recommended that Gyprock plasterboard surfaces be isolated from structural elements, by the use of control joints or other means where:

- A plasterboard surface abuts any structural element or dissimilar wall or ceiling assembly
- The framing construction changes within the wall or ceiling.

Control joints incorporated in a building to permit movement in the structure must be carried through all areas lined with plasterboard.

Refer to Junctions & Penetrations in the wall and ceiling sections of this guide for appropriate details.

## Fire Rating Considerations

The fire rating of systems is determined by laboratory testing to determine the time to failure of three performance measurements, which combine to give a Fire Resistance Level (FRL). They are:

### Structural Adequacy

Failure occurs when the specimen collapses under load.

### Integrity

Failure occurs when the specimen develops cracks or openings through which flames or hot gases can pass.

### Insulation

Failure occurs when the average temperature of the unexposed surface of the specimen increases by more than  $140^\circ\text{C}$  above the initial temperature, or the temperature at any point of the unexposed surface increases by more than  $180^\circ\text{C}$  above the reference temperature.

The test performance of the specimen is expressed as a Fire Resistance Level (FRL), which indicates the number of minutes for which the specimen fulfils the requirements of the three fire test criteria. These numbers are then rounded down to the nearest regulatory requirement.

The common regulatory FRL requirements are:

Non-Loadbearing	Loadbearing
- /30/30	30/30/30
- /60/60	60/60/60
- /90/90	90/90/90
- /120/120	120/120/120
- /180/180	180/180/180

For Example: - /120/120.

The dash indicates no requirement for Structural Adequacy, which applies to all non-loadbearing systems.

The first 120 indicates Integrity for 120 minutes.

The second 120 indicates Insulation for 120 minutes.

### Resistance To The Incipient Spread Of Fire

Ceiling systems may be required to achieve a Resistance to the Incipient Spread of Fire. This requires the ceiling to provide adequate thermal insulation to prevent combustibles in a roof/ceiling or floor/ceiling cavity from igniting for the specified time.

The Building Code of Australia requirement for some ceilings is to provide Resistance to the Incipient Spread of Fire (RISF), into the space above it, for not less than 60 minutes.

### Fire Hazard Properties

Fire hazard properties of wall and ceiling linings in some classes of building are specified by the BCA. Refer to Book 1 Design Guide – Fire, Acoustics and Thermal for fire hazard properties of CSR products.

### Smoke Proof Walls

Smoke proof walls are required in some Class 9a buildings, and, where they do not require an FRL, must be built from non-combustible materials. Steel framed wall systems clad with Gyprock plasterboard may be used.

Fire rated smoke proof walls should be selected from the steel framed systems with an appropriate FRL.

Smoke proof walls required for Class 9c buildings may use steel or timber framing with linings of 13mm Gyprock plasterboard.

### Penetrations

Service penetrations in fire rated walls and ceilings that can be effectively rated include electrical and data cables, switches and GPOs, hydraulic pipes, vents and mechanical ducts. Access panels and control joints can also be installed with appropriate fire resistance levels.

Power outlets and light switches can be installed in fire rated walls using fire rated switch boxes to maintain the FRL of the wall system in which they are installed.

Where fire and acoustic rated switch boxes are specified, refer to the manufacturer for appropriate products and installation details.

Metal pipe penetrations may be treated as per BCA deemed-to-satisfy details or in accordance with a proprietary assessed detail. Recommended products are Gyprock Fire Mastic and CSR FireSeal which have been tested in fire penetration systems. Other tested sealants of equivalent or better performance may be used and it is the responsibility of the supplier to provide supporting technical information and details. For systems without a suitable insulation component to the FRL, isolation of the service from combustible materials may be required to meet DTS solutions.

Plastic pipes, and pipes with insulating lagging, are usually treated with fire collars in accordance with manufacturers' details, in both walls and ceilings.

### Repairs

Fire grade boards damaged prior to installation should not be used. For boards damaged after installation, some repair methods are available. Contact CSR DesignLINK for details.

### Acoustic Performance

Building acoustics can be separated into sound absorption and sound transmission. Sound absorption relates to control of sound that is generated within a room and how it affects people in that room.

Sound transmission relates to sound that passes through a dividing element (direct sound, controlled by the element's sound insulation), and through the surrounding structure (indirect or flanking transmission).

Methods of controlling noise in buildings can be based on systems, structure and lining materials and their absorption and transmission properties. CSR recommends that an acoustic engineer be consulted for all projects where acoustics are important.

### Direct Transmission

Building elements including wall and ceiling systems are rated for direct sound transmission in terms of  $R_w$  and  $R_w+C_{tr}$ .  $R_w$ , Weighted Sound Reduction Index, is measured in a laboratory as the difference between a generated noise in one room and that received in an adjacent room. A higher number indicated a greater reduction of sound.  $C_{tr}$  is a modifier to account for low frequency noise, and is a negative value added to  $R_w$ .

### Flanking Transmission

Flanking sounds reach adjoining areas by indirect paths, rather than through the dividing element. The perimeter junction of walls, floors and ceilings that surround the dividing element are the main paths for flanking transmission. Other paths include open windows, ducts, doorways and suspended ceilings.

### Sound Impact Ratings

The BCA has performance requirements relating to sound impact for floors and some walls.

For floors, this is specified as a maximum value such as:

$L_{NW} = 62$ . Note that lower values of  $L_{NW}$  indicates better acoustic impact performance.

Walls may be required to meet the definition of Discontinuous Construction. This means that wall leaves must be separated by at least 20mm and no mechanical connection is permitted, except that masonry may have resilient ties.

### Gaps, Crack And Holes

Small openings allow airborne sound to pass through an element and can significantly reduce sound insulation performance. For optimum sound insulation, the element must be airtight. Perimeters must be sealed with an acoustic sealant that is capable of accommodating the expected building movement.

For systems that are multi-layered, such as masonry composite systems, each layer must also be air tight.

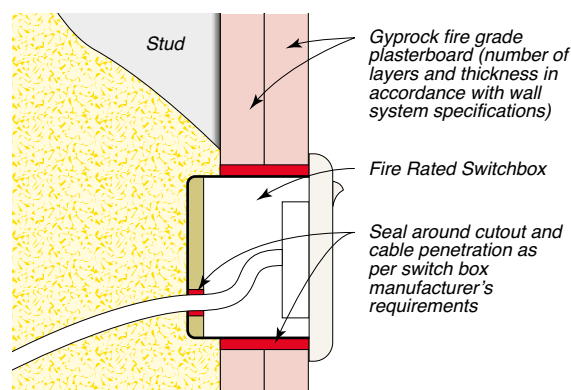
### Penetrations

The acoustic performance of walls and ceilings can be reduced by penetrations for plumbing, electrical switches, light fittings, etc. For construction that is acoustically sensitive, it is recommended that, wherever possible, such penetrations are avoided. In other cases, rated proprietary sealants and products should be used.

There is a wide range of services and materials that may be required to penetrate sound rated walls and ceilings, and in varied configurations and concentrations. CSR recommends that an acoustic engineer be consulted for advice on all details for projects with specific acoustic objectives.

Fire and acoustic rated switch boxes are available from manufacturers such as PROMAT, CLIPSAL and HPM to assist in maintaining the acoustic integrity of wall systems.

**Figure 2: Typical Power Outlet/Light Switch Installation Using Fire Rated Switch Box**



### Sequence of Works

The sequence of works should be considered on a situation-by-situation basis, but generally will follow the following order:

- Framing installation.
- Wet trades.
- Roughing in of mechanical and electrical services. This may require the installation of plasterboard sections in order to form neat openings for pipes.
- Insulation installation.
- Plasterboard installation.
- Penetrations
- Finishing of services.
- Sealants and junction treatment.
- Jointing of plasterboard.
- Decorative finishing.

## Levels Of Finish

Levels of finish are defined in the Australian/New Zealand Standard AS/NZS2589.1 Gypsum linings – Application and Finishing for non-fire rated applications. This standard is intended to provide builders, plasterboard installers and finishers, and their customers with the various defined methods and practices necessary to meet the customers expectations in terms of the Level of Finish.

Three Levels of Finish (3, 4 and 5) are defined, and minimum specifications to achieve each level of finish are detailed in the standard for each of the installation processes from framing preparation to finishing. All details may not be suitable for fire rated systems or multilayer systems.

It is essential to determine the level of finish required before the frame construction begins, as specific tolerances are required for frame alignment as well as for plasterboard fixing and finishing for each of the levels of finish. Unless these requirements are met throughout construction, it may not be possible to attain the desired finish level without extensive corrective measures.

The level of finish specified also affects the methods of jointing, particularly butt joints and back-blocking requirements, the number of coats of joint compound applied, and the fitting and finishing of stopping beads. Refer to Table 6.

It should be noted that, generally, residential applications should be prepared to a minimum Level 4 Finish unless specifically a higher or lower level of finish is agreed to by all contracting parties. Other commercial applications should be specified in contract documents.

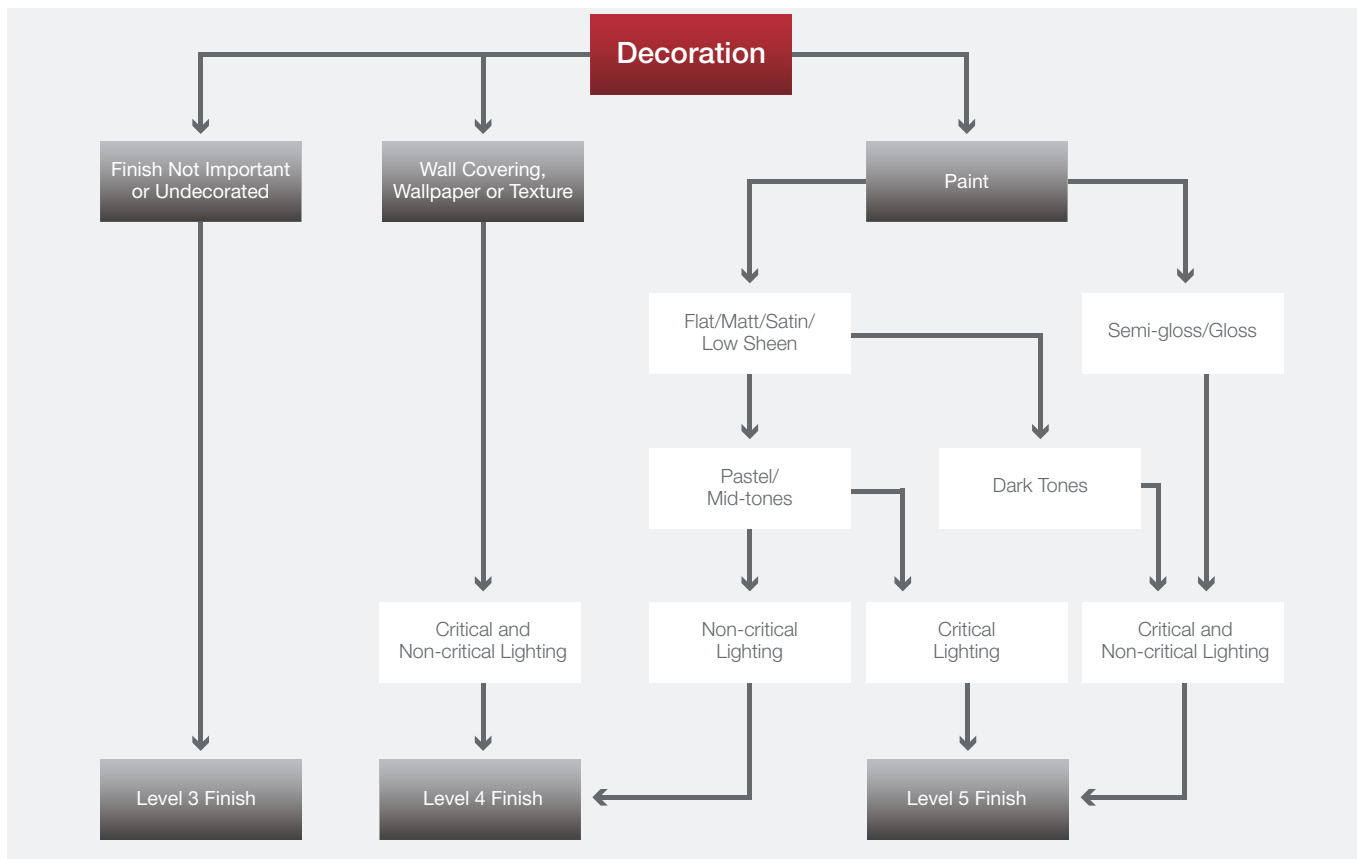
### Selection of Level of Finish

Factors affecting the level of finish include the surface's visibility, the texture and gloss level of the final decoration and the lighting conditions. Critical or glancing light is that projected across the surface at low angles of incidence, as opposed to diffused lighting or light striking the surface at close to right angles. Refer to the following section "Surface Finishing & Lighting" on page 16.

A good method to overcome differences in opinions of quality is to prepare a sample area in a suitable position and for all parties to agree on the finish. The flow chart Figure 3 and Table 6 will assist in selecting the most appropriate Level of Finish for each area.

For further information on levels of finish, refer to Plasterboard Expectations, available from the Association of Wall & Ceiling Industries.

Figure 3: Selecting A Level Of Finish



**Level 3**

For use in areas that do not require a finish, such as above ceilings and inside service shafts and other inaccessible spaces. All joints are to be taped with two applications of compound and all fastener heads are to be covered. Compound is to be finished smooth, such as by scraping ridges etc with a trowel.

**Level 4**

This is generally the accepted level of finish for residential construction. Joints are to have a tape coat, and two separate coats are to be applied over the tape coat and fastener heads. All joint compound should be sanded to a smooth finish free of tool marks and ridges. Full details can be found in the Jointing section.

Gyprock One Finish is a pre-mixed acrylic compound designed to create a uniform surface on interior walls and ceilings affected by critical lighting conditions. The application of One Finish over a standard level 4 finish will improve the final surface and minimise the effects of critical light, however it will not automatically upgrade the work to a level 5 finish.

**Level 5**

This level of finish should be used wherever gloss or semi-gloss paints are to be used, where paint is mid or dark coloured, or where critical light conditions occur such as from windows, skylights, or silhouette and spot lighting.

A three coat jointing system is required as for level four. All joint compound should be sanded to a smooth finish free of tool marks and ridges. This should be followed by the application of proprietary surface preparations by skim coating to remove differential surface textures and porosity.

Skim coating is a term used to describe a thin finish coat, rolled, trowelled or airless sprayed and then possibly sanded, to achieve a smooth and even finish. It is normally less than 1mm in thickness and is applied over the entire surface to fill imperfections in the joint work, smooth the paper texture and provide a uniform surface for decorating.

**Table 6: Summary Of Gyprock Level Of Finish Dependent Installation Requirements**

It should be noted that, generally, residential applications should be prepared to a minimum level 4 finish unless specifically a higher or lower level of finish is agreed to by all parties.										
Key to Symbols: – = Not Applicable. ✓ = Required. Other symbols, see notes.										
Level of Finish	Max. Frame Alignment Deviation mm	Joint Between Frame Members and Back-block				* Adhesive + Fastener Fixing	OR	* Fastener Only Fixing	Jointing and Finishing (minimum)	
		Ceilings		Walls					Butt and Recessed Joints Internal and External Corners	
		Butt	Recessed	Butt	Recessed					
3	4	–	–	–	–	✓	OR	✓	Tape Coat + Second Coat	
4	4	✓	✓ ② ③	✓①	–	✓	OR	✓	Tape Coat + Second Coat + Finish Coat	
5	3	✓	✓	✓①	–	✓	OR	✓	Tape Coat + Second Coat + Finish Coat + Skim Coat to the entire surface	
NOTES										
① Where a butt joint in a wall is less than 400mm long and is located more than 2 metres from the floor, there may be no need to provide back-blocking.										
② Back-blocking required only where 3 or more recessed joints occur in a continuous ceiling area.										
③ Back-blocking is not required in suspended ceilings with no rigid connection between ceiling and walls.										
* Tiled and or fire rated installations MUST be all fastener fixed, adhesive is not permitted.										

## Surface Finishing & Lighting

Builders, plasterers and painters work hard to achieve the appearance of a flat surface when installing walls and ceilings. However some surface variation is inevitable due to the following factors:

- Natural variations in the framing.
- The hand-finished nature of a plasterboard wall or ceiling.
- Subtle differences between the textures of plasterboard and the jointing compounds.

Under the majority of lighting conditions a plasterboard surface finished to a Level 4 standard, as defined in AS/NZS2589 Gypsum Linings - Application and finishing, will appear flat. In critical lighting conditions, an effect referred to as glancing light, will highlight any surface variations.

This section will assist in minimising glancing light issues and enhance the occupant's enjoyment of their premises.

### What Is Glancing Light?

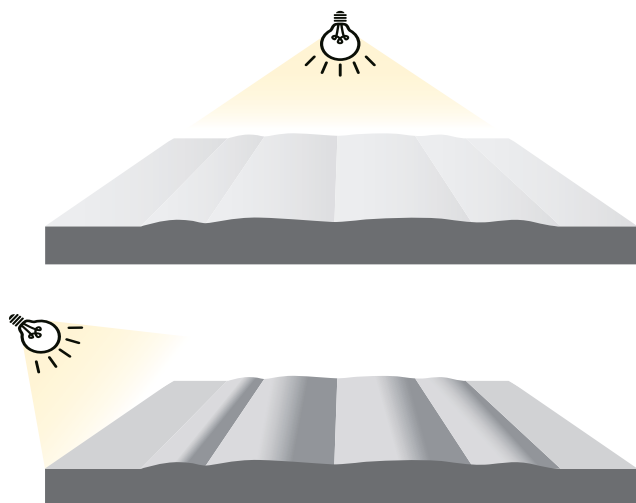
Glancing light (or critical light) is a condition which exists when light hits the plasterboard surface at an acute angle and casts shadows that highlight any surface irregularities. On plasterboard walls and ceilings this can make the surface look uneven and highlight the appearance of joints.

This is most commonly found in situations where there are:

- Floor to ceiling windows.
- Windows directly adjacent to walls.
- Unshaded batten holder ceiling lights.
- Ceiling mounted fluorescent lights.
- Wall lights and downlights close to walls.
- Windows at the end of long corridors.
- Brightly lit rooms.
- Lights installed just below skillion/raked ceilings.
- Reflections of light from water features.

### Consideration To Minimise Glancing Light

Figure 4: What Is Glancing Light



The best time to consider potential glancing light issues is during the design phase, which allows choices to be made that can greatly reduce the impact of glancing light.

Large window areas are a popular feature of modern design and the preference for open plan living and working often results in ceilings and walls that extend through a number of different spaces. These features can lead to challenging lighting conditions for wall and ceilings surfaces.

When designing a project it is important to consider the effect of both natural and artificial light and how it will fall on the walls and ceilings across the whole day.

In particular, attention should be given to light entering the building in mornings and evenings when the sun is lower in the sky and casts elongated shadows that can highlight any surface variations in walls and ceilings.

### Shading

For windows that are positioned where glancing light can be an issue, the use of external shading or vertical louvres may help to mitigate any problems. Curtains or interior blinds are also helpful in this situation.

### Window Placement And Orientation

Ideally windows should not abut walls or ceilings and should be oriented away from the east and west. External reflective surfaces, such as pools or neighbouring buildings, can reflect light into the space, should also be considered as they can exacerbate the problem.

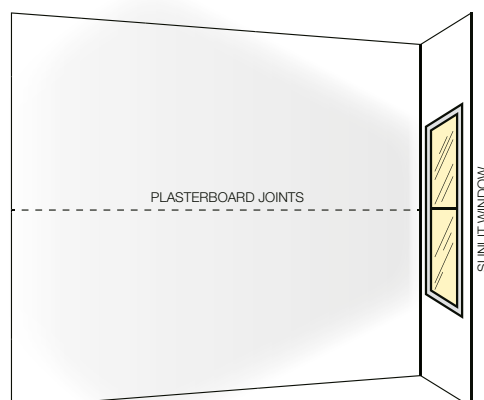
Rooms with windows in two orientations provide a more uniform natural light, and can reduce the effects of critical light.

### Joint Orientation

The installation of plasterboard walls and ceilings should also be considered as there are a number of design and installation choices which can significantly impact the appearance of the surface.

Running the plasterboard so that the long joints are parallel to the direction of the light will help reduce the effects of glancing light. The use of longer sheets to reduce the number of butt joints is also beneficial.

Figure 5: Joint Orientation





### Artificial & Natural Lighting

Any imperfection in a completed lining installation will be made obvious by a condition called critical lighting or glancing light, where the incident light from an artificial or natural light source is nearly parallel to the surface. Glancing light also greatly exaggerates the size of imperfections making them glaringly obvious.

The worst result is achieved by an unshaded light source located directly on a ceiling or wall where the light shines parallel to the surface.

Cases where this situation may exist include:

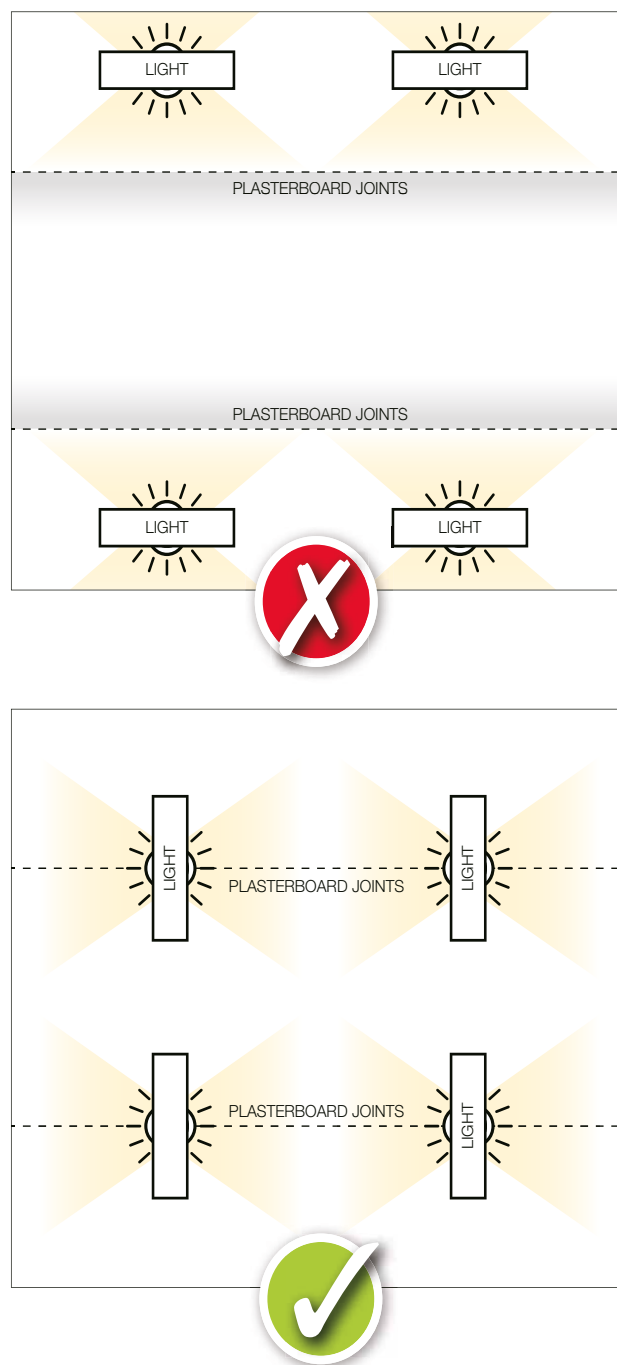
- Unshaded batten holder light fittings.
- Fluorescent lights mounted on the ceiling.
- Wall mounted up lights and downlights.

### Methods To Minimise Glancing/Critical Lighting Effects From Artificial Lighting Sources

The following lighting solutions will provide diffused light and reduce the appearance of surface variations:

- Shaded batten holder light fittings.
- Ceiling mounted pendant lights.
- Recessed ceiling lights such as downlights and recessed fluorescents (although recessed lights are more likely to be associated with glare problems).
- Consider the use of more lights of lower intensity at regular spacings, ensuring lit areas overlap. This will improve ambiance and reduce the visible effects of glancing light, and minimise shadows that can occur from a single row or single light source.
- Allow a generous angle of incidence to the surface for feature lighting such as spotlights, to minimise the highlighting of imperfections.
- Do not locate a single or isolated unshaded light source close to a wall or ceiling in a space which has generally low levels of light.
- Do not use uplights, wall-washers and spotlights in areas with a smooth wall finish to eliminate light being emitted at a glancing angle to the surface.
- Preferably, locate fluorescent lights about 450mm below the ceiling as this will give a more even distribution of light.
- When installing ceiling mounted fluorescent lights it is recommended to position the light fittings over the long edge joints. Refer to the following illustration.

Figure 6: Installation Of Ceiling Mounted Fluorescent Light



### Methods To Minimise Glancing/Critical Lighting Effects From Natural Lighting Sources

- Do not take window glazing right up to the ceiling level.
- Avoid placing windows or glass doors immediately adjacent to the end of a wall.
- Provide sun shades over the windows and glass doors.
- Recess the window to stop the sunlight reaching the wall.

## Applied Finish Selection

The chosen finish selected for walls and ceilings plays a very important role in determining the effects of glancing light.

A Level 4 finish presents the painter with a surface comprised of two different materials, namely the plasterboard paper surface and the jointing compound, which have different textures and porosity.

In order to achieve a consistent finish across these materials it is vital that a plasterboard primer sealer is applied.

AS/NZS2311, Guide to the painting of buildings, requires that **a sealer plus two coats of water based paint must be applied as a minimum**. Such a system will provide a surface with minimal difference in texture and porosity.

Roller application for all coats is strongly recommended as it imparts a light texture to the surface and minimises visible differences. If spray application is used, each paint coat should be back rolled while still wet, to create a lightly textured finish, and allowed to dry completely before applying the next coat. Paint applied with a longer pile roller tends to mask imperfections better than those applied with a short pile roller.

A similar paint system is recommended for a level 5 finish to ensure the best possible result.

### Paint Finishes

The choice of gloss level can also have a significant impact on the perceived quality of the surface in glancing light conditions.

A matt paint finish provides the highest level of light diffusion and helps to disguise any surface irregularities. It is recommended that a matt finish be used in areas where a higher gloss is not required for functional reasons, such as ceilings. Textured or heavy patterned finishes tend to hide imperfections.

Higher gloss levels, such as satin, semi gloss and gloss, can accentuate any minor variations in the surface and are recommended only for use over a level 5 finish.

### Colour Selection

Light colours diffuse light more effectively than dark shades and reduce the effects of glancing light. In rooms where a dark colour is to be used a level 5 finish is recommended.

### Wall Paper Finishes

Gyprock plasterboard walls may be finished with wall paper. A Level 4 Finish is recommended. A primer sealer should be applied to the surface prior to wall paper application. This will also assist with future removal.

Thin wall papers may still highlight imperfections in the wall surface. Textured or heavy patterned finishes tend to hide imperfections.

## Inspection of Plasterboard

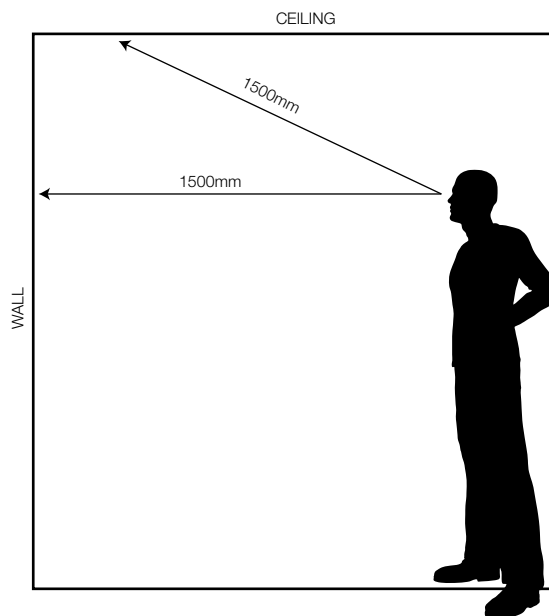
The Guide to Standards and Tolerances (Victorian Building Commission 2015) outlines the following standard for inspection of vertical and horizontal surfaces.

“Generally, variations in the surface colour, texture and finish of walls, ceilings, floors and roofs, and variations in glass and similar transparent materials are to be viewed where possible from a normal viewing position. A normal viewing position is looking at a distance of 1.5 m or greater (600 mm for appliances and fixtures) with the surface or material being illuminated by non-critical light. Non-critical light means the light that strikes the surface is diffused and is not glancing or parallel to that surface.

Slight variations in the colour and finish of materials do not always constitute a defect”.

It is recommended that illumination for inspections be provided to imitate as closely as possible the expected conditions that will be in place at completion.

Figure 7: Inspection Of Plasterboard





## Handling & Storage

All materials must be kept dry, preferably stored inside. Care should be taken to avoid sagging or damage to ends, edges and surfaces of sheets.

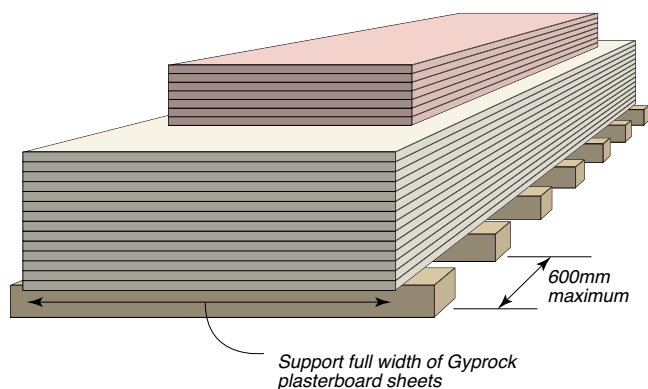
All Gyprock plasterboard must be stacked flat, properly supported on a level platform or on support members which extend the full width of the sheets and which are spaced at a maximum of 600mm centres.

If stored outside, sheets must be stored off the ground, stacked as detailed and protected from the weather.

Buildings should be sealed against water ingress before plasterboard is installed. It is recommended that plasterboard damaged by water is replaced.

Sheets must be dry prior to fixing, jointing and finishing.

Figure 8: Stacking And Support Of Lining Sheets



## Plasterboard Cutting

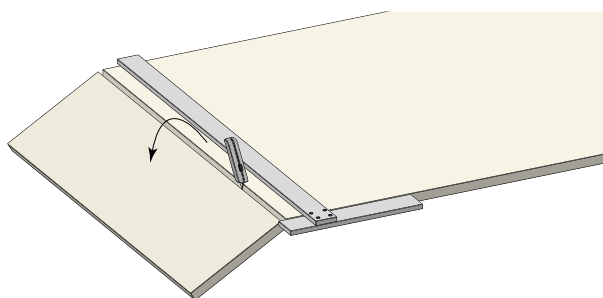
Gyprock plasterboard can be cut by scoring the face linerboard with a knife and snapping the plasterboard back away from the scored face.

Always score the front (non-printed) face first. The back linerboard can then be cut from the back towards the front. Gyprock Impactchek has fibreglass mesh behind the back face paper, so this face must also be cut before snapping.

Alternatively a saw may be used from the front face.

Cut edges are to be smoothed as required to permit neat joints. A metal T-square will assist in creating a clean, straight cut.

Figure 9: Plasterboard Cutting



TIP: Site recessing tools are available to treat cut edges for easier jointing.

All cut-outs for pipes, electrical installations, fixtures etc, are to be scored on both faces before removal, or are to be cut out with a suitable tool. **The use of an impact tool such as a hammer is not an acceptable method of producing cut-outs.**

If the plasterboard adhesive is not properly cured, hold the sheet in place with temporary blocks on adjacent studs or joists while making cut-outs.



## NOTES

# Wall System Design & Selection

## Introduction

CSR Gyprock Steel Frame Wall Systems use zinc coated steel components with one or more layers of Gyprock plasterboard linings fixed to one or both sides. A wide choice of systems is available for both fire rated and non-fire rated applications in non-loadbearing and loadbearing situations.

This guide provides detailed installation information for the fixing of Gyprock plasterboard to single stud, staggered stud, double stud, curved walls and columns for both non-fire rated and fire rated applications.

Frame selection and assembly guidance is also provided for non-loadbearing interior applications. For exterior and loadbearing applications, and where seismic loads apply, framing details and connections are to be in accordance with the designer's specifications.

## Applications

Gyprock Steel Frame Wall Systems are most commonly used in non-loadbearing applications, in commercial, industrial, institutional, residential and high-rise construction, or in the renovation of older buildings.

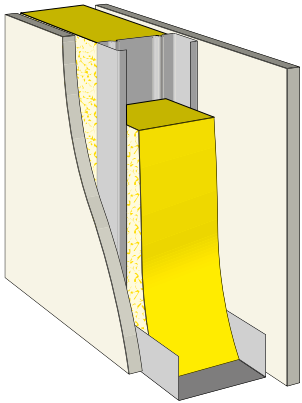
Gyprock Steel Frame Wall Systems can be used for internal loadbearing applications (including residential applications) provided the steel framing is designed to support vertical loadings.

## Overview of Steel Framed Wall Types

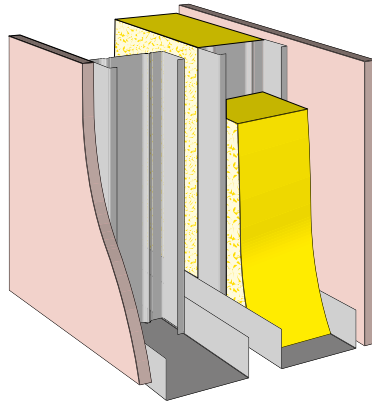
Gyprock Steel Framed Wall Systems utilise Gyprock plasterboard sheets that are fixed to appropriately prepared framing. Joints are taped and set to form a smooth flush jointed continuous surface suitable for painting, wallpapering or tiling.

Gyprock Flush Jointed Wall Systems are suitable for virtually all interior residential and commercial applications. Where a level of finish is specified, refer to details in this guide or to AS/NZS2589.1 for additional framing and fixing requirements.

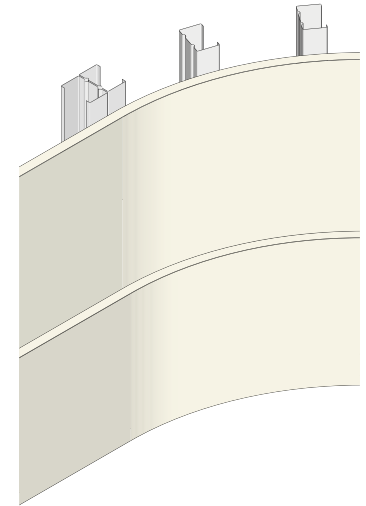
Specific wall systems are available for decorative, acoustic, fire rated, water resistant and impact resistant applications.



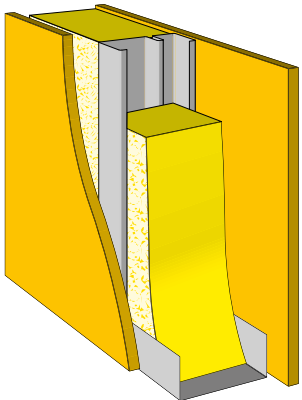
*Single Stud Framing Lined One or Two Sides*



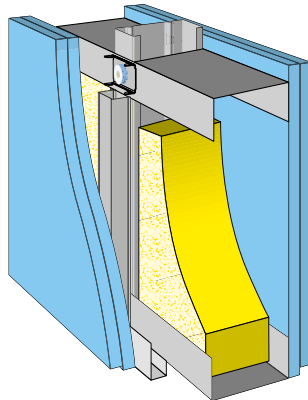
*Double Stud Framing Lined Two Sides*



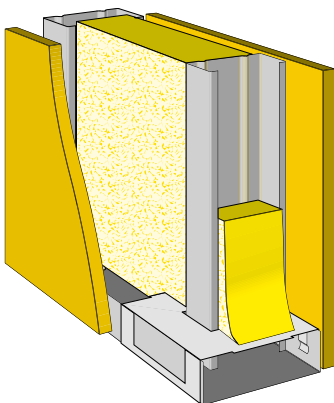
*Curved Stud Framing Lined One or Two Sides*



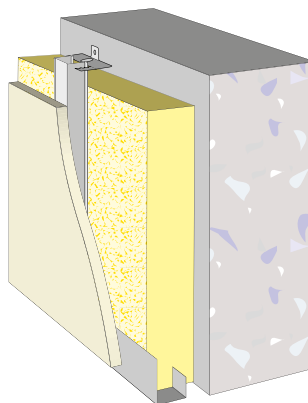
*Rondo Quiet Stud Framing Lined Two Sides*



*Resilient Mounted Furring One Side of Stud Framing*



*Staggered Stud Framing Lined Two Sides*



*Furring Channel Framing Lined One Side*

## Design Considerations

### Structural Design

All walls must be designed for the applied loads. Guidance is given for the selection of Rondo studs for non-loadbearing internal walls only.

Loadbearing walls, walls subject to wind pressures, and walls subject to seismic actions shall be appropriately designed to meet the relevant Australian Standards or construction manuals.

Walls lined with Gyprock fire grade plasterboard meet the requirements of BCA Specification C1.8 Clause 3.4 – Walls generally.

### Non-Loadbearing Walls

Maximum wall heights are shown in Table 18 to Table 22. These walls are designed for lateral wind pressures only, using the composite action of the frame and sheeting.

Internal wall studs are friction fitted into tracks with no clearance at the bottom and an allowance for vertical expansion at the top. Where vertical building movement is expected, a suitable gap must be specified. In this case deflection head tracks must be used.

Staggered stud walls using Rondo C studs must use an appropriate head and base detail to restrain the stud from twisting. Insulation may need to be cut to fit between studs at 300mm centres.

Wall tracks must be fixed to floors and ceilings at 600mm maximum centres. Each plate fixing is required to resist seismic loads, wind pressure and all other applicable loads. For walls up to 5m high with pressures up to 0.35kPa, fasteners with a shear load capacity of 0.75kN may be used. For other UDLs, the shear load should be calculated.

### Loadbearing Walls

The building designer must ensure loadbearing walls have been designed:

- To resist all applied loads.
- To be in accordance with AS/NZS4600.
- Assuming no contribution to axial strength is required of the wall linings.

To meet the stated Fire Resistance Level (FRL), the axial load capacity of some wall systems is reduced. This is a result of the steel weakening at high temperature during a fire test. The systems are noted with an Axial Capacity Reduction percentage (ACR%). For these systems, the designer must increase the applied loads before selecting stud size to compensate for the axial capacity reduction percentage, as shown in the system specification.

### External Walls

The capacity of head and base tracks for walls subject to wind loads must be checked. Typically, studs are cleated at head and base with a Rondo angle bracket. Contact Rondo for more information on designing walls subject to wind loads.

### Wind Loads

All linings and framing are to be designed for the appropriate wind loads. Contact CSR for loads higher than stated in this manual.

Tall residential buildings often have exterior operable doors and windows, resulting in internal walls being subject to wind pressure. In these cases, walls must be designed for the appropriate loads.

Refer to framing selection information in Wind Loads in Table 7 for maximum framing centres.

**Table 7: Maximum Framing Centres For Plasterboard And Wallboard Linings On Interior Walls.**

Linings (horizontal or vertical sheet orientation)	Wind Load (kPa) Ult.			
	0.25	0.50	0.75	1.00
10mm Gyprock Plus	600	600	450	450
Other 10mm Gyprock plasterboard	600	600	600	450
13 and 16mm Gyprock plasterboard	600	600	600	600
6 and 9mm CeminSeal Wallboard	600	600	600	600
Rigitone Perforated panels	333*			
Gyptone Perforated panels	600*			

\* Nominal spacing is independent of wind pressure.

### Fire Resistance

The steel frame wall systems in this manual are suitable for the stated FRL when designed in accordance with the structural considerations above.

Steel framed walls required to have an FRL must comply with the following:

- Framing must be made from steel of up to 2.4mm BMT.
- Wall plates must be fixed to the fire rated support structure with steel fasteners.
- Gyprock fire grade plasterboard must be screw fixed and adhesive is not to be relied on. Linings that do not contribute to the system FRL may use adhesive.
- In wet areas, Gyprock moisture resistant fire grade plasterboard must be used in lieu of Gyprock Fyrchek.
- Joints in the outer layer of all systems must be set. As a minimum, a single coat finish may be used.

### Caulking

To attain the specified FRL, all perimeter gaps must be carefully filled to the specified depth with appropriate caulking material, including Gyprock Fire Mastic or CSR FireSeal. Other tested fire rated material of equivalent or better performance may be used where sealant is specified. It is the responsibility of the supplier to provide supporting technical information and details.

### Acoustic Performance

The performance of the as-built system may be affected by sound flanking, the effectiveness of workmanship and caulking, the presence and treatment of penetrations, and the inclusion of structural elements and bridging items. Refer to appropriate detailed information on addressing these issues.



# Components

## Sheet Fasteners

Screws for fixing Gyprock plasterboard to steel framing. For wet area and protected external applications, Class 3 or Class 4 fasteners must be used as appropriate. To guarantee performance, only approved fasteners should be used in these systems.

- Gyprock Type S Needle Point (NP) Screws.
- Gyprock Type S Drill Point (DP) Screws.
- Gyprock Plasterboard Laminating Screws.

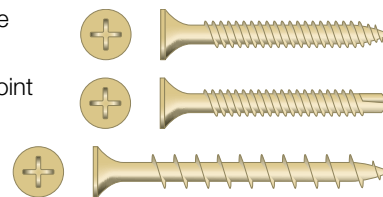


Table 8: Screw For Fixing Plasterboard To Steel 0.5 – 0.8mm BMT

Plasterboard Thickness	1st Layer	2nd Layer	3rd Layer
6.5mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 25mm NP Screw	–
10mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 40mm NP Screw	–
13mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 40mm NP Screw	Type S #8-15 x 65mm NP Screw and #10x40mm Laminating Screw
16mm Plasterboard	Type S #6-18 x 30mm NP Screw	Type S #6-18 x 45mm NP Screw	Type S #8-15 x 65mm NP Screw and #10x40mm Laminating Screw
13mm + 16mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 45mm NP Screw	–

Table 9: Screw For Fixing Plasterboard To Steel 0.8 – 2.4mm BMT

Plasterboard Thickness	1st Layer	2nd Layer	3rd Layer
6.5mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 25mm DP Screw	–
10mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 40mm DP Screw	–
13mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 40mm DP Screw	Type S #8-15 x 65mm NP Screw* and #10x40mm Laminating Screw
16mm Plasterboard	Type S #6-18 x 30mm DP Screw	Type S #6-18 x 45mm DP Screw	Type S #8-15 x 65mm NP Screw* and #10x40mm Laminating Screw
13mm + 16mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 45mm DP Screw	–

\* Pilot hole may be required for Needle Point (NP) screws.

Table 10: Fixing Plasterboard And CeminSeal Wallboard To Steel 0.5 – 0.8mm BMT

Lining Thickness	1st Layer	2nd Layer
6mm Wallboard	Type S #8-15 x 20mm NP Screw or FibreTEKS® 10G-18 x 25mm	–
9mm Wallboard	Type S #8-15 x 30mm NP Screw or FibreTEKS® 10G-18 x 30mm	–
6mm Wallboard + 13/16mm Plasterboard over	Type S #8-15 x 20mm NP Screw or FibreTEKS® 10G-18 x 25mm	Type S #6-18 x 40mm NP Screw
9mm Wallboard + 13/16mm Plasterboard over	Type S #8-15 x 30mm NP Screw or FibreTEKS® 10G-18 x 30mm	Type S #6-18 x 40mm NP Screw
13mm Plasterboard + 6/9mm Wallboard over	Type S #6-18 x 25mm NP Screw	Type S #8-15 x 40mm NP Screw
16mm Plasterboard + 6/9mm Wallboard over	Type S #6-18 x 30mm NP Screw	Type S #8-15 x 40mm NP Screw

Table 11: Fixing Plasterboard And CeminSeal Wallboard To Steel 0.8 – 2.4mm BMT

Lining Thickness	1st Layer	2nd Layer
6mm Wallboard	Type S #8-15 x 20mm DP Screw	–
9mm Wallboard	Type S #8-15 x 30mm DP Screw	–
6mm Wallboard + 13/16mm Plasterboard over	Type S #8-15 x 20mm DP Screw	Type S #6-18 x 40mm DP Screw
9mm Wallboard + 13/16mm Plasterboard over	Type S #8-15 x 30mm DP Screw	Type S #6-18 x 40mm DP Screw
13mm Plasterboard + 6/9mm Wallboard over	Type S #6-18 x 25mm DP Screw	Type S #8-15 x 40mm DP Screw
16mm Plasterboard + 6/9mm Wallboard over	Type S #6-18 x 30mm DP Screw	Type S #8-15 x 40mm DP Screw

NOTES: • Pre-drill 9mm and 12mm Wallboard for easier fixing. • Use Class 3 fixings for external applications. • NP = Needle Point Screws. • DP = Drill Point Screws.

## Adhesives

### Gyprock Acrylic Stud Adhesive

- Gyprock Acrylic Stud Adhesive is coloured blue for easy identification. It can be used in temperatures not less than 5°C.
- Contact surfaces must be free of oil, grease or other foreign materials before application. The adhesive is applied with a broad knife to form 25mm diameter by 15mm high walnuts. This product is suitable for use with pre-painted metal battens and some treated timbers. Always follow directions on packaging.

### Warning

- Stud adhesive must not be relied on in fire rated systems.
- Daubs of adhesive must never coincide with fastener points.
- Stud adhesive does not constitute a fixing system on its own and it must be used in conjunction with nail or screw fasteners.



### Gyprock Masonry Adhesive

- Gyprock Masonry Adhesive is used to adhere Gyprock plasterboard to concrete and all masonry substrates.



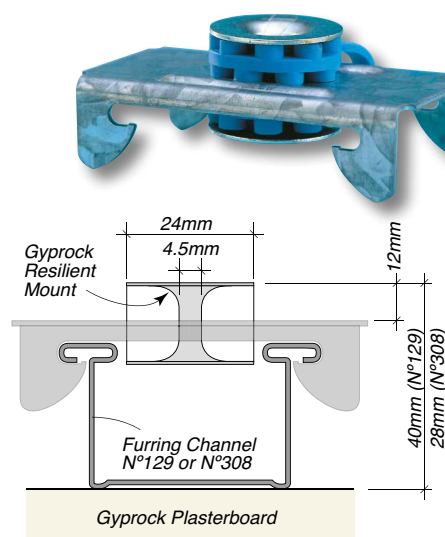
## Mounting Clips

### Gyprock Resilient Mount

- A proprietary component used in conjunction with Rondo steel sections for fastening Gyprock plasterboard to a supporting structure while simultaneously isolating it from structure borne vibration.

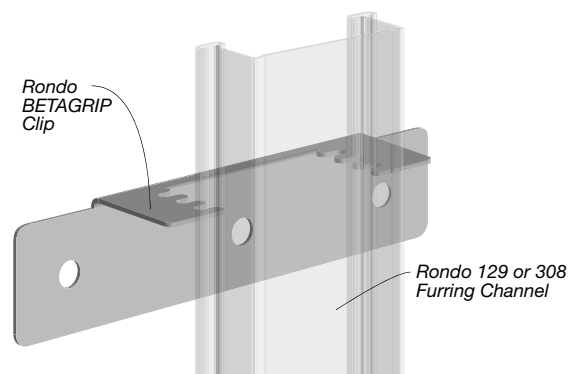
This significantly reduces the amount of impact noise, speech and low frequency sound filtering through to rooms above, below or alongside the noise generating room.

The resilient mount has been designed for use on ceilings and can be used on walls provided plasterboard with minimum mass of 12.5kg/m<sup>2</sup> is fixed on the resilient mount side of the wall. The mount can be used in fire rated and non-fire rated systems.



### Rondo BETAGRIP Clip

- Used for attaching furring channel 129 or 308 in wall and ceiling installations.



### Steel Component Selection

CSR Gyprock recommends steel components manufactured by Rondo Building Services Pty Ltd.

Additional information on steel building components can be obtained from Rondo, telephone 1300-367-663.

Other steel components of equivalent performance may be used, however it is the responsibility of the manufacturer of the steel component to substantiate equivalent performance to the recommended component.

### Steel Studs

Rondo Steel Studs are manufactured with 25mm diameter holes at regular spacings along the web to allow electrical/plumbing services to be easily installed through framing. Service holes in adjacent studs should be aligned at the time of frame assembly.

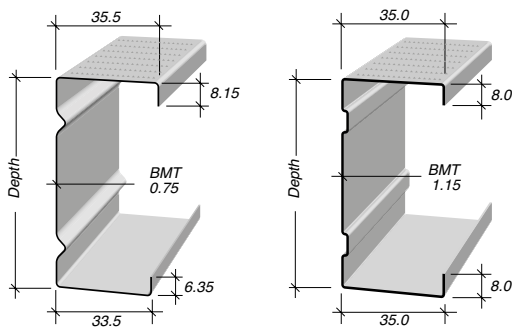
Studs of 0.50, 0.55 and 0.75mm BMT have bell-mouthed service holes which have no protruding sharp edges, thereby eliminating the need to fit grommets to protect electrical installations.

Studs of 1.15mm BMT have punched service holes at regular spacings along the web.

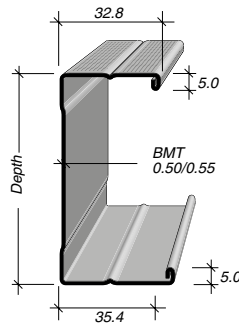
Table 12: Production Sizes For Rondo Steel Studs (mm)

Depth	BMT	2400	2700	3000	3300	3600	4200	4800	6000	7200	7500
51	0.50*	✓	✓	✓	✓	✓					
	0.75		✓	✓							
64	0.50*	✓	✓	✓	✓	✓	✓				
	0.75	✓	✓	✓		✓		✓			
	1.15		✓	✓							
76	0.55*	✓	✓	✓	✓	✓	✓	✓			
	0.75	✓	✓	✓		✓		✓	✓		
	1.15	★	★	✓		★		★	★		
92	0.55*	✓	✓Q	✓Q	✓	✓Q	✓	✓	✓		
	0.75	✓	✓Q	✓Q	✓	Q	✓	✓Q	✓		
	1.15		★	✓		★		★	★	★	
150	0.75					✓		✓	✓		✓
	1.15									★	

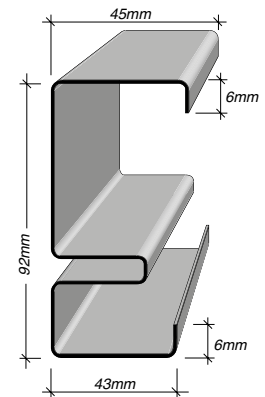
★ = Production lead time may be required Q = Rondo Quiet Stud \* = Rondo Hemmed Stud



Rondo Lipped Steel Stud Profiles



Rondo Hemmed Stud



Rondo Quiet Stud



Rondo Stud Clip N°126

Table 13: Fixing Material Usage – Approximate Quantities Used Per 100 m<sup>2</sup> Of Gyprock Plasterboard (Per Layer)

Fixing System	Framing Centres (mm)	Adhesive	Screws
Adhesive + Screw	600	3.5 kg	620
	450	4.2 kg	750
Fully Screwed	600 (Vertical Sheets)	–	1150
	600 (Horizontal Sheets)	–	820
	450 (Horizontal Sheets)	–	1000
Masonry adhesive to wall	N/A	20 – 24 kg	–

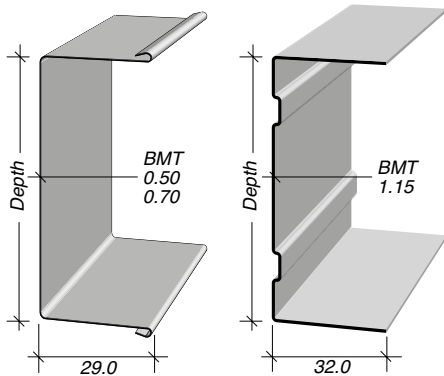


**Wall Track**

- Rondo Wall Track is used at the top and bottom of wall frames to locate the wall studs. Studs are held in the track by friction fit to allow for movement in the structure.

**Table 14: Standard Production Sizes For Rondo Wall Stud Track**

Depth (mm)	BMT			Length (mm)
	0.5	0.7	1.15	
51	✓	–	–	3000
64	✓	✓	✓	3000
76	✓	✓	✓	3000
92	✓	✓	✓	3000
150	–	–	✓	3000



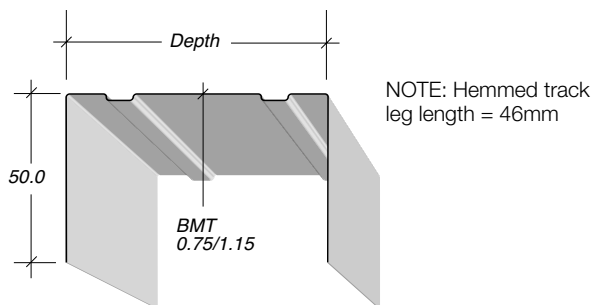
**Deflection Head Track**

- Rondo Deflection Track is used at the top of wall frames to locate the wall studs and to allow for vertical deflection of the ceiling/soffit. Studs are held in the track by friction and must not be fixed to the deflection track in any way. Plasterboard must not be fixed through the track. Refer to installation information in the Wall System Detailing section of this guide.

**Table 15: Production Sizes For Rondo Deflection Head Track**

Depth (mm)	BMT			Length (mm)
	0.7*	0.75	1.15	
51	✓	–	–	3000
64	✓	–	✓	3000
76	✓	–	✓	3000
92	✓	–	✓	3000
150	–	✓	✓	3000

\*= Rondo Hemmed Stud

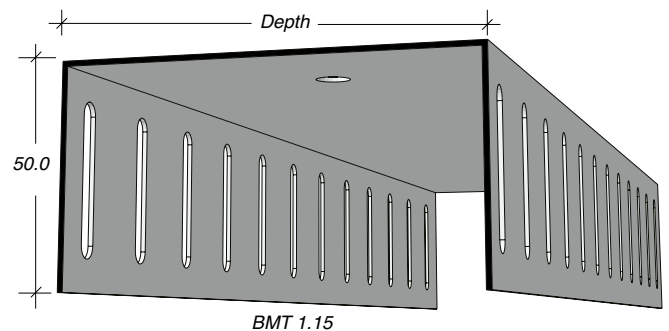


**MAXItrack Slotted Deflection Head**

- Rondo MAXItrack is used at the top of wall frames to locate the wall studs and to allow for vertical building movement. It provides a positive connection to the stud and removes the requirement for an extra nogging near the top track used in some systems.

**Table 16: Production Sizes For Rondo MAXItrack**

Depth (mm)	BMT	Length (mm)
	1.15	
94	✓	3000
150	✓	3000

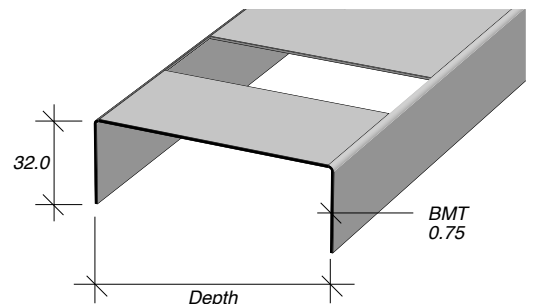


**Rondo Nogging Track**

- Rondo Nogging Track is designed to support the wall studs and prevent twisting of the studs. Factory punched holes in the web allow quick installation to the studs. Nogging track is an alternative to conventional cut noggings. When fitted, nogging track should be screw fixed or crimped to both flanges of each stud unless noted otherwise.

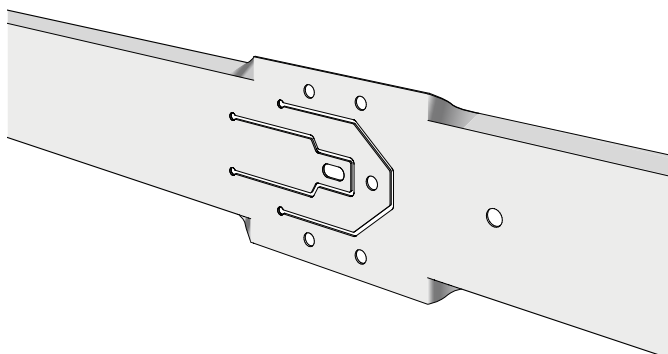
**Table 17: Rondo Steel Nogging Track**

Depth (mm)	Stud Spacing		Length (mm)
	450mm	600mm	
	Track 0.75 BMT		
51	✓	✓	3600
64	✓	✓	3600
76	✓	✓	3600
92	✓	✓	3600
150	✓	✓	3600



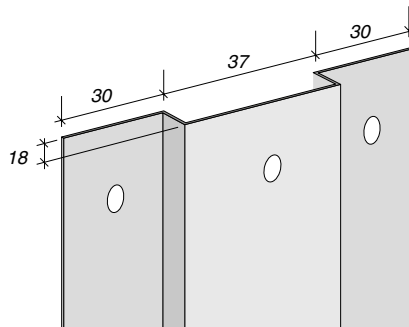
**Rondo FAST-FIX Nogging**

- Used on one side of studs. Available to suit 300, 400, 450 and 600mm stud centres.



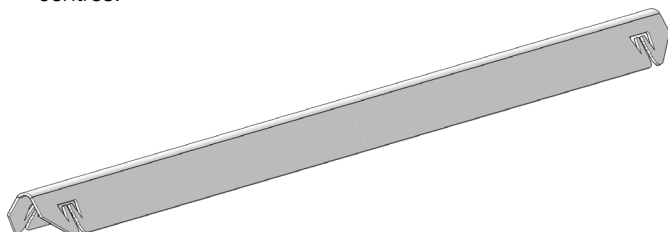
**Rondo 501 Continuous Nogging Bracket**

Supplied in 2400mm lengths for on-site cutting to length

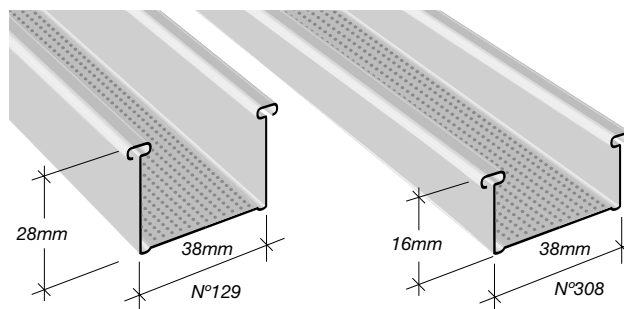


**Rondo SNAP-LOCK Nogging**

- Used in the bell-mouthed service holes of 0.5 and 0.55mm BMT studs. Available to suit 300, 400, 450 and 600mm stud centres.

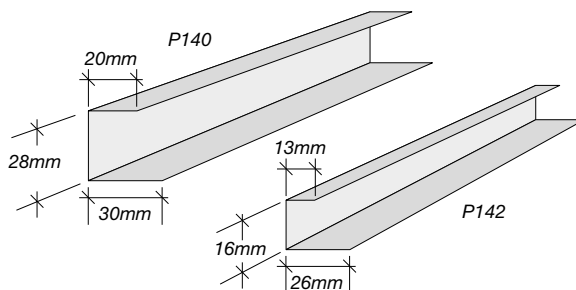


**Rondo P129/308 Furring Channel**



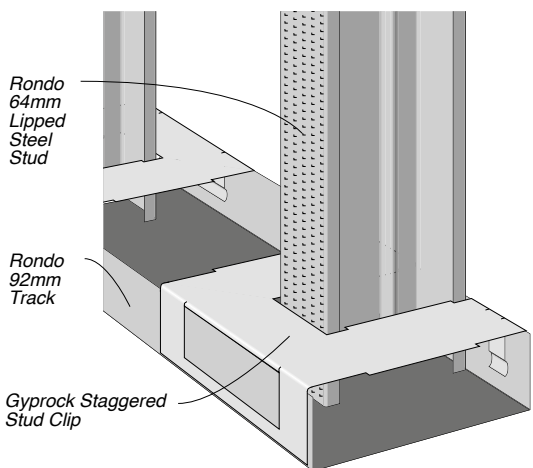
**Furring Channel Track (J-Track)**

- Used at walls to support ends of furring channels at ceiling/wall junctions or for fixing directly to ceiling plasterboard at ceiling/wall junctions. Also used at head and base of wall incorporating furring channels.



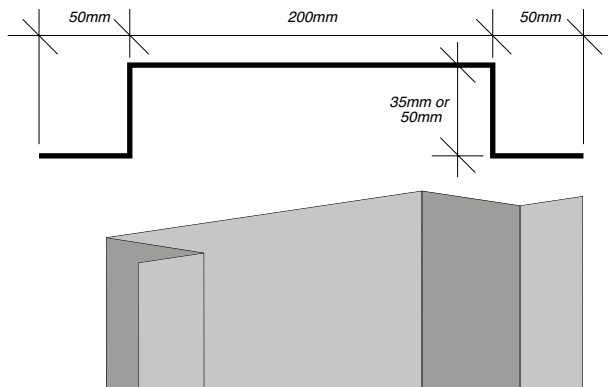
**Gyprock Staggered Stud Clip**

For Use At Top And Bottom Tracks



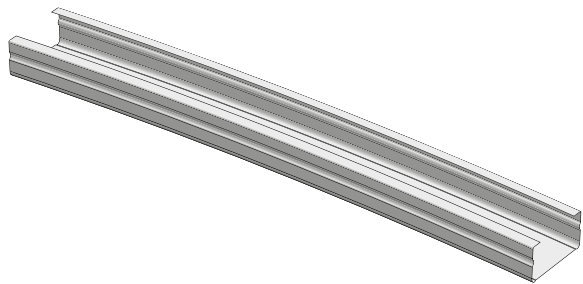
**Gyprock Silencer F**

- Used to provide fire and acoustic treatment where services such as plumbing or electrical switches are incorporated in wall systems.



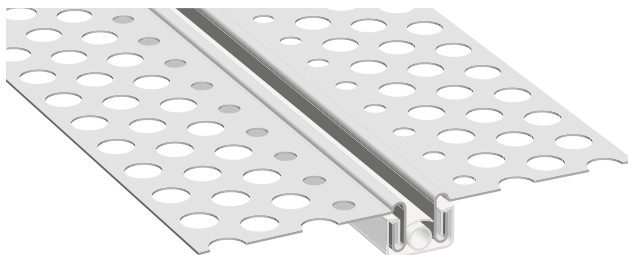
### Rondo B005 Battens

- Used to form depressions at butt joints in non-fire rated wall and ceiling systems to enable smooth jointing.



### Rondo P35 Control Joint

- Used at some control joints during the finishing process.



### Mastics & Sealants

In fire rated systems where caulking is indicated, a fire-rated sealant such as Gyprock Fire Mastic or CSR FireSeal must be used. Where specified for joints designed for significant movement, a sealant such as CSR FireSeal should be used. Both products are also recommended for caulking acoustic systems and are available in 600ml sausages.



Gyprock Wet Area Acrylic Sealant is recommended for sealing non-fire rated wet area systems. It is available in 300ml cartridges.



Other tested fire and acoustic rated material of equivalent or better performance may be used where sealant is specified. It is the responsibility of the supplier to provide supporting technical information and details.

### Jointing Compounds

CSR Gyprock has a wide range compounds, cements and accessories for finishing plasterboard installations.

Refer to the "Jointing & Finishing" section of this guide for details.



### Insulation Materials

CSR Fire and Acoustic Systems incorporate Bradford glasswool and rockwool as well as Bradford and Martini polyester insulation. These products have undergone significant acoustic testing and have a proven track record of performance and durability in service. Additional information on Bradford Insulation materials is available by telephoning CSR Bradford on 1300 850 305.



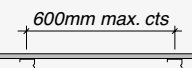
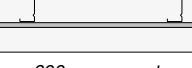
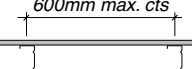

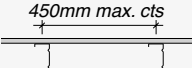
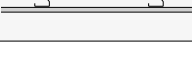
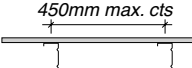

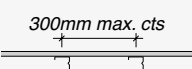
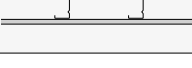
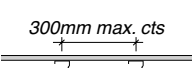


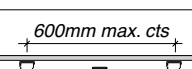
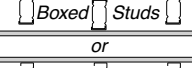
Although insulation materials are often specified for thermal resistance, they can contribute significantly to the acoustic performance of wall and ceiling systems. CSR only recommends materials that have been tested for fire and acoustic applications, have proven durability, and are supported by their manufacturer for these applications. Should other insulation materials be used, the manufacturer of those materials must verify the performance of the complete system, CSR will not support the performance of substitute materials.



# Stud Selection Tables

Table 18 to Table 22 provide stud selection information suitable for all CSR Gyprock non-fire rated and fire rated non-loadbearing internal wall systems. Refer to Rondo for other design pressures, loadbearing walls, studs partially lined and for walls subject to seismic loads.

**Table 18: Maximum Wall Height With Rondo Lipped Steel Studs – Non-Loadbearing Internal Walls**  
– Walls Generally (Load = 0.25kPa) – Maximum FRL –/120/120 Unless Noted

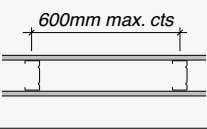
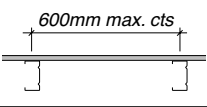
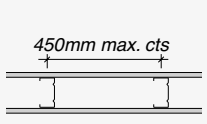
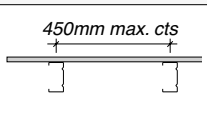
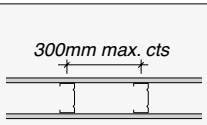
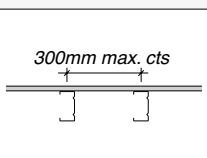
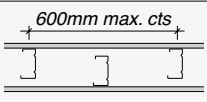
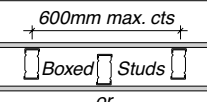
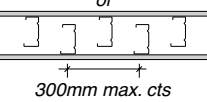
Wall Frame and Lining Configuration	Stud Size (mm)	51		64			76			92			150	
	BMT (mm)	0.5	0.75	0.5	0.75	1.15	0.55	0.75	1.15	0.55	0.75	1.15	0.75	1.15
	Plasterboard Linings (mm)	Maximum Wall Height (mm)												
<b>Single Studs @ 600mm max. centres</b>														
	10	2770	2910	3330	3930	4170	3700	4430	4650	4540	4830	5110	6550	7220
	13	3200	3320	3720	4220	4430	4130	5020	5220	4940	5500	5750	6990	7540
	16	3380	3520	3910	4350	4520	4300	5250	5420	5180	5710	5920	7190	7650
	–/180/180 systems	–	–	3300	3600	4300	3800	4100	5000	4400	4800	5800	7000	7650
	10	2320	2600	2720	3130	3530	3200	3580	4050	3610	4130	4690	5330	6810
	13	2320	2600	2720	3250	3580	3240	3820	4050	3610	4180	4690	5370	6810
	16	2320	2600	2750	3280	3590	3250	3870	4050	3610	4200	4690	5370	6810
	–/180/180 systems	–	–	3300	3600	4300	3800	4100	5000	4400	4800	5800	7000	7650
<b>Single Studs @ 450mm max. centres</b>														
	10	3020	3200	3580	4180	4460	4020	4780	5070	4850	5270	5620	7140	7750
	13	3420	3570	3930	4430	4690	4410	5330	5570	5210	5890	6190	7520	8040
	16	3550	3710	4130	4600	4820	4580	5580	5790	5450	6120	6390	7620	8130
	–/180/180 systems	–	–	3300	3600	4300	3800	4100	5000	4400	4800	5800	7000	8130
	10	2520	2860	2930	3410	3870	3500	3910	4450	4050	4520	5150	6510	7400
	13	2520	2860	2930	3530	3930	3580	4170	4450	4050	4610	5150	6510	7400
	16	2520	2860	3020	3560	3950	3600	4220	4450	4050	4630	5150	6510	7400
	–/180/180 systems	–	–	3020	3560	3950	3600	4220	4450	4050	4630	5150	6510	7400
<b>Single Studs @ 300mm max. centres</b>														
	10	3390	3620	3960	4570	4930	4510	5310	5690	5340	5930	6390	7840	8570
	13	3730	3940	4260	4780	5120	4830	5770	6110	5640	6450	6860	8110	8740
	16	3800	4020	4450	4980	5270	5010	6030	6330	5860	6690	7070	8230	8850
	–/180/180 systems	–	–	4400	4980	5270	5010	5800	6330	5860	6690	7070	8230	8850
	10	2890	3270	3380	3900	4430	4010	4480	5090	4630	5180	5900	7350	8290
	13	2890	3270	3380	4010	4490	4130	4730	5090	4640	5290	5920	7350	8290
	16	2890	3270	3460	4050	4510	4150	4790	5090	4640	5310	5930	7350	8290
	–/180/180 systems	–	–	3460	4050	4510	4150	4790	5090	4640	5310	5930	7350	8290
<b>Staggered Studs – Single Studs @ 600mm max. centres</b>														
	10/13/16	–	–	2370	2830	3510	–	–	–	–	–	–	–	–
<b>Staggered Studs – Boxed Studs @ 600mm or Single Studs @ 300mm max. centres</b>														
	10	–	–	2930	3610	4430*	–	–	–	–	–	–	–	–
	13	–	–	2990	3700	4490*	–	–	–	–	–	–	–	–
	16	–	–	3060	3790	4510*	–	–	–	–	–	–	–	–
	–/180/180 systems	–	–	3060	3790	4510*	–	–	–	–	–	–	–	–

## NOTES:

- Deflection Limit is SPAN/240 to a maximum of 30mm, in accordance with BCA Specification C1.8.
- Tabulated heights do not include axial loads (except self weight) or shelf loading.
- Loadings: Pultimate = 0.375 kPa, Pservice = 0.25 kPa.
- Walls are not for external applications.
- All loadings in accordance with AS/NZS1170 series.

- Linings to be full height of wall.
- Walls analysed in accordance with AS/NZS4600.
- Noggings in accordance with Table 21.
- Heights are suitable for up to two layers of the nominated thickness.
- Staggered studs with FAST-FIX noggings may use heights for studs lined one side.
- \* 1.15mm BMT Studs cannot be boxed.
- Tables have been prepared by Rondo Building Services Pty Ltd.

Table 19: Maximum Wall Height With Rondo Lipped Steel Studs – Non-Loadbearing Internal Walls  
– Walls Of Shafts And Fire Isolated Exits (Load = 0.35kPa) – Maximum FRL –/120/120 Unless Noted

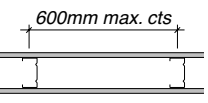
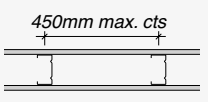
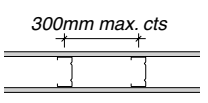
Wall Frame and Lining Configuration	Stud Size (mm)	51			64			76			92			150	
	BMT (mm)	0.5	0.75	0.5	0.75	1.15	0.55	0.75	1.15	0.55	0.75	1.15	0.75	1.15	
	Plasterboard Linings (mm)	Maximum Wall Height (mm)													
<b>Single Studs @ 600mm max. centres</b>															
	10	2420	2550	2930	3490	3700	3250	3880	4090	4020	4220	4470	5150	5150	
	13	2810	2920	3290	3750	3940	3650	4430	4600	4390	4840	5060	5710	5710	
	16	3000	3120	3450	3840	3990	3780	4620	4770	4600	5010	5200	6370	6890	
	–/180/180 systems	–	–	3300	3600	3990	3780	4100	4770	4400	4800	5200	6370	6890	
	10	2050	2320	2330	2770	3140	2750	3180	3620	3070	3680	4190	5000	6180	
	13	2050	2320	2330	2860	3170	2740	3370	3620	3060	3690	4190	5000	6180	
	16	2050	2320	2330	2880	3170	2740	3400	3620	3050	3690	4190	4990	6180	
	–/180/180 systems	–	–	–	–	–	–	–	–	–	–	–	–	–	
<b>Single Studs @ 450mm max. centres</b>															
	10	2650	2810	3160	3710	3970	3550	4220	4470	4310	4640	4950	6340	6870	
	13	3020	3150	3490	3950	4180	3900	4710	4930	4640	5200	5470	6680	7340	
	16	3150	3300	3650	4070	4270	4050	4920	5110	4840	5390	5630	6840	7460	
	–/180/180 systems	–	–	3300	3600	4270	3800	4100	5000	4400	4800	5630	6840	7460	
	10	2260	2560	2640	3050	3460	3130	3500	3980	3540	4050	4610	5510	6800	
	13	2260	2560	2640	3140	3500	3160	3700	3980	3540	4090	4610	5510	6800	
	16	2260	2560	2660	3170	3510	3170	3740	3980	3530	4100	4610	5500	6800	
	–/180/180 systems	–	–	–	–	–	–	–	–	–	–	–	–	–	
<b>Single Studs @ 300mm max. centres</b>															
	10	2990	3200	3510	4070	4400	4000	4700	5040	4760	5240	5650	7160	7820	
	13	3310	3490	3790	4270	4570	4290	5130	5430	5030	5720	6070	7380	7990	
	16	3380	3580	3950	4420	4690	4440	5350	5620	5220	5920	6260	7490	8070	
	–/180/180 systems	–	–	3950	4420	4690	4440	5350	5620	5220	5920	6260	7490	8070	
	10	2590	2930	3030	3490	3960	3590	4010	4560	4150	4630	5280	6800	7630	
	13	2590	2930	3030	3580	4010	3660	4210	4560	4150	4710	5280	6800	7630	
	16	2530	2930	3080	3610	4020	3670	4260	4560	4150	4720	5280	6800	7630	
	–/180/180 systems	–	–	3080	3610	4020	3670	4260	4560	4150	4720	5280	6800	7630	
<b>Staggered Studs – Single Studs @ 600mm max. centres</b>															
	10	–	–	2140	2590	3150	–	–	–	–	–	–	–	–	
<b>Staggered Studs – Boxed Studs @ 600mm or Single Studs @ 300mm max. centres</b>															
	10	–	–	2650	3260	–	–	–	–	–	–	–	–	–	
															

## NOTES:

- Deflection Limit is SPAN/240 to a maximum of 30mm, in accordance with BCA Specification C1.8.
- Tabulated heights do not include axial loads (except self weight) or shelf loading.
- Loadings: P<sub>ultimate</sub> = 0.525 kPa, P<sub>service</sub> = 0.35 kPa.
- Walls are not for external applications.
- All loadings in accordance with AS/NZS1170 series.

- Linings to be full height of wall.
- Walls analysed in accordance with AS/NZS4600.
- Noggings in accordance with Table 21.
- Heights are suitable for up to two layers of the nominated thickness.
- Staggered studs with FAST-FIX noggings may use heights for studs lined one side.
- \* 1.15mm BMT Studs cannot be boxed.
- Tables have been prepared by Rondo Building Services Pty Ltd.


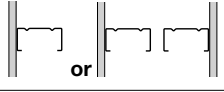

Table 20: Maximum Wall Height With Rondo Lipped Steel Studs – Non-Loadbearing Internal Walls  
– Walls Generally (Load = 0.25kPa) – With Tiles Up To 32kg/m<sup>2</sup> And 12mm max. Thickness – Maximum FRL –/120/120 Unless Noted

Wall Frame and Lining Configuration	Stud Size (mm)	51		64			76			92			150	
	BMT (mm)	0.5	0.75	0.5	0.75	1.15	0.55	0.75	1.15	0.55	0.75	1.15	0.75	1.15
	Plasterboard Linings (mm)	Maximum Wall Height (mm)												
<b>Single Studs @ 600mm max. centres</b>														
	10	2420	2540	2710	3340	3560	3190	3860	4070	3550	4240	4490	5620	6200
	13	2490	2880	2690	3580	3770	3240	4130	4530	3540	4660	5020	5930	6510
	16	2470	2990	2670	3610	3900	3210	4060	4730	3510	4580	5200	5800	6650
	–/180/180 systems	–	–	2670	3600	3900	3210	4060	4730	3510	4580	5200	5800	6650
<b>Single Studs @ 450mm max. centres</b>														
	10	2620	2770	3060	3540	3800	3450	4140	4400	4130	4590	4850	6100	6780
	13	2900	3080	3150	3750	3990	3750	4590	4820	4130	5100	5370	6410	7040
	16	2870	3140	3130	3940	4140	3740	4690	5020	4090	5300	5570	6580	7180
	–/180/180 systems	–	–	3130	3600	4140	3740	4100	5000	4090	4800	5570	6580	7180
<b>Single Studs @ 300mm max. centres</b>														
	10	2910	3120	3360	3870	4210	3840	4570	4910	4520	5120	5540	6870	7700
	13	3190	3380	3610	4050	4360	4110	4950	5250	4770	5540	5920	7110	7900
	16	3200	3400	3780	4240	4510	4270	5190	5460	4970	5770	6110	7260	8020
	–/180/180 systems	–	–	3780	4240	4510	4270	5190	5460	4970	5770	6110	7260	8020

NOTES:

- Deflection Limit is SPAN/360 to a maximum of 30mm, in accordance with BCA Specification C1.8.
- Tile loading up to 32kg/m<sup>2</sup> has been considered. Tile thickness not to exceed 12mm without further checking.
- Loadings: Pultimate = 0.375 kPa, Pservice = 0.25 kPa.
- Walls are not for external applications.
- All loadings in accordance with AS/NZS1170 series.
- Walls analysed in accordance with AS/NZS4600.
- Noggings in accordance with Table 21.
- Heights are suitable for up to two layers of the nominated thickness.
- Tables have been prepared by Rondo Building Services Pty Ltd.

Table 21: Minimum Number Of Noggings For Rondo Lipped Stud Framing

Stud Configuration	Lining Configuration	Wall Height (mm)	Number of Noggings equally spaced
	Lining Two Sides	0 - 4400	0
		4401 - 8800	1
	Lining One Side of each stud row	0 - 3000	1*
		3001 - 6000	2*
		6001 - 8000	3*
		8001 - 8800	4*
	Lining Two Sides	All	0

NOTES:

- \* Studs lined one side only must have an additional nogging (in each stud row) at no more than 100mm from the top of the wall. Refer to Figure 95.
- Where Rondo MAXitrack is used at the head of the wall, the additional nogging at no more than 100mm from the top of the wall is NOT required.
- Nogging is required behind butt joints in the first layer of fire rated vertical sheeting applications.
- Where nogging is required, it should be screw fixed or crimped to both flanges of each stud.



Table 22: Maximum Wall Height For Rondo Quiet Stud – Non-Loadbearing Walls – Walls Generally Load = 0.25kPa

Minimum Plasterboard Thickness each side of framing	92 x 0.55BMT Quiet Stud				92 x 0.75BMT Quiet Stud			
	Stud Spacing (mm)							
	300	400	450	600	300	400	450	600
1 x 10mm	4510	4160	4020	3700	5310	4930	4780	4430
1 x 13mm	4830	4530	4410	4130	5770	5450	5330	5020
1 x 16mm	5010	4700	4580	4300	6030	5710	5580	5250
2 x 10mm	4510	4160	4020	3700	5310	4930	4780	4430
2 x 13mm	4830	4530	4410	4130	5770	5450	5330	5020
2 x 16mm	5010	4700	4580	4300	6030	5710	5580	5250

NOTES:

- Deflection Limit is SPAN/240 to a maximum of 30mm, in accordance with BCA Specification C1.8.
- Tabulated heights do not include axial loads (except self weight) or shelf loading.
- Loadings: Pultimate = 0.375 kPa, Pservice = 0.25 kPa.
- Walls are not for external applications.
- All loadings in accordance with AS/NZS1170 series.
- No nogging track to be used with Rondo Quiet stud.
- Heights are suitable for up to two layers of the nominated thickness
- Tables have been prepared by Rondo Building Services Pty Ltd.

# Non-Fire Rated Wall Systems

## Framing Requirements

Non-loadbearing wall framing is constructed using Rondo lipped steel studs fitted into track sections positioned at the top and bottom of the wall.

Deflection head track must be used on all walls exceeding 4800mm in height and may be specified in any wall system to allow for vertical movement of the roof/ceiling.

Studs are held in the tracks by friction fit, and they must not be fixed to head track by mechanical fasteners or crimping except where specifically required around door openings.

CSR Gyprock recommends that internal non-loadbearing, non-fire rated walls be designed for a minimum UDL of 0.25kPa or in some cases 0.35kPa. Refer to Table 18 to Table 22 for suitable stud sizes/height selection information. Where higher pressures are specified, contact Rondo for additional information.

### Control Joints

Control joints must be installed to allow for structural movement. Allowance for movement must be made through the frame, lining and any tiles.

Vertical control joints in stud walls are to be constructed using two studs with a 15-20mm gap between.

Door frames extending from floor to ceiling constitute control joints. For doors less than ceiling height, a control joint extending from one corner of the frame may be used.

Control joints must be installed at all construction joints in the building and at the following locations:

- Non-tiled internal walls with plasterboard outer layer – at 12m maximum centres.
- Non-tiled internal walls with fibre cement outer layer – at 7.2m maximum centres.
- Tiled internal walls – at 4.8m maximum centres.
- External ceilings – at 6m maximum centres.
- At junctions with other building elements.
- At changes of lining material.
- At changes of structural support systems.
- At each storey or rise of studs.

Refer to the Junctions & Penetrations for appropriate details.

### Track Fixings

Each track fastener is required to withstand a shear load of 0.75kN for walls with a design load of 0.25kPa.

For walls with a design UDL of 0.35kPa, each track fastener is required to withstand a shear load of 1.1kN. For other loads, and for walls subject to seismic loads, refer to the framing designer.

When fixing to concrete or masonry, use power driven fasteners, expansion anchors (eg. Dynabolts), or easy drive masonry anchors. For walls subject to seismic loads, fasteners shall comply with AS5216.

When fixing to suspended ceiling systems, use Gyprock Type S Screws, toggle bolts or expandable fasteners.

### Nogging

Nogging may be required to increase the strength of a stud, to reinforce lining joints, or to support attachments. The recommended components to be used as nogging are Rondo Nogging Track, Rondo FAST-FIX nogging, and Rondo SNAP-LOCK nogging.

Nogging is required for structural purposes as set out in Table 21, and in the following locations:

- Behind butt joints in the first plasterboard layer in vertical sheeting applications. (Nogging Track).
- In all loadbearing walls. Refer to the project engineer or Rondo for technical requirements.

Where nogging track is used, it should be screw fixed or crimped to both flanges of each stud unless noted. Rondo FAST-FIX noggings should be installed with 2 screws to the face and one screw in the web tab, unless noted.

Nogging track must not be installed in staggered stud or Quiet Stud wall systems, as additional connection between studs reduces the acoustic performance of these wall systems.

## Framing Preparation

### Single Stud, Double Stud Framing & Studs Lined One Side

- Accurately align floor and ceiling tracks according to the wall layout and fasten in place at 100mm maximum from each end of the track and at 600mm maximum centres along the track.
- Place studs into the tracks and twist into position. The track flanges should provide a friction fit. Ensure studs are bottomed in floor track. Do not fix studs to top tracks.

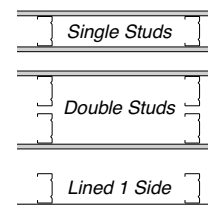
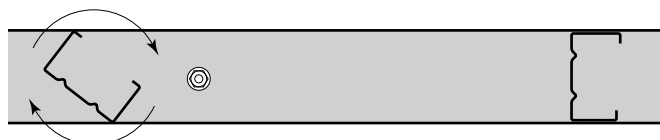


Figure 10: Stud Installation





- Position a stud at each end of the wall, and where appropriate, fix its web to the adjacent wall structure.
- Position studs along the wall at 600mm maximum centres. The open sides of these studs should be facing the end of the wall from which sheeting will begin.
- Where nogging track is to be used, fit to studs before installing into tracks. Otherwise cut-to-length nogging, FAST-FIX, or SNAP-LOCK noggings can be fitted after stud installation.

### Staggered Stud Framing

Staggered stud steel frame wall systems can provide effective resistance to sound transmission and acoustic impact. They are suitable for non-fire rated and fire rated applications, and are constructed using various steel sections as studs.

Alternate studs are laterally offset so that the plasterboard is attached to one side only of each stud. The studs are held in place by either Gyprock Staggered Stud Clips or Rondo P140 sections.

Staggered stud wall systems are constructed using the Gyprock Staggered Stud Clip to locate 64mm depth lipped studs in 92mm floor and ceiling tracks. Alternatively, Rondo P140 sections may be used to restrain studs in tracks 92mm or more in width. Refer to detailed assembly information.

Staggered Stud System Components:

- Rondo 64mm lipped steel studs.
- Gyprock Staggered Stud Clip.
- Rondo P140 track.

#### Installation With Staggered Stud Clips

Set out, align and install floor and ceiling tracks in the normal manner. Position the stud clips on to the floor tracks to suit the stud layout. Cut the studs to appropriate length to suit the installation. Slide the upper stud clips onto the studs, leaving them about 150mm from the top. Place the bottom of the stud into the floor clip and swing the top of the stud into the head track, angling the stud as required. Slide the top clip into the head track.

The clips may be riveted or screw fixed to the track to permanently locate studs if required. Refer to additional framing requirements detailed earlier in this guide.

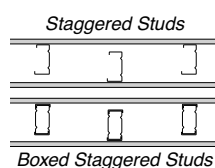
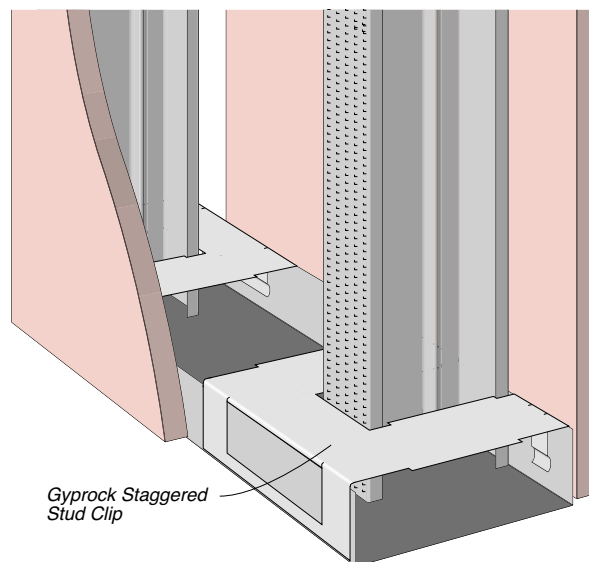


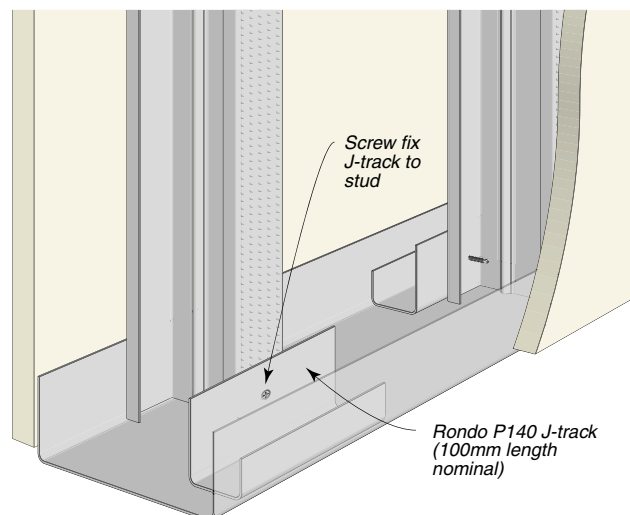
Figure 11: Staggered Stud Base With Gyprock Staggered Stud Clip (Head Similar)



#### Installation With Rondo P140 Spacer

Set out, align and install floor and ceiling tracks in the normal manner. Cut the studs to appropriate length to suit the installation. Place the bottom of the stud into the floor track and swing the top of the stud into the head track, positioning the stud as required. Cut and insert P140 into the space between the top of the stud and the 92mm track. Crimp, screw fix or rivet the P140 to the stud, leaving a suitable deflection gap. For wider tracks, fix the P140 section through to the slab only. Repeat procedure at the wall base.

Figure 12: Staggered Stud Base With Rondo P140 Spacer (Head Similar)



## Sheet Installation

The following installation information should be read in conjunction with Table 6, to determine the requirements applicable to the chosen Level of Finish.

Provide adequate ventilation in all structures to minimise air humidity. Excessive humidity may result in the plasterboard warping.

### Sheet Layout

Gyprock plasterboard sheets may be installed horizontally or vertically. Sheet orientation should be chosen so that any critical light falls along the recessed joints, or to minimise the number of butt joints. To achieve some Levels of Finish horizontal sheeting should be used, except that a single sheet may be fixed vertically where it covers the whole wall.

### Control Joints

Control joints must be installed to allow for structural movement. Allowance for movement must be made through the frame, lining and any tiles.

Vertical control joints in walls are to be constructed using two studs with a 15-20mm gap between.

Refer to Control Joints in the preceding Framing section for appropriate locations.

Refer to Junctions & Penetrations for appropriate details.

### Electrical Wiring

Where electrical wiring is obviously mounted for connection to a wall or ceiling fixture, the installer shall pass the cables through a neat, close-fitting hole in the face of the sheet at the appropriate position clearly marked by the electrician.

### Tiled Walls

Where Gyprock plasterboard or CeminSeal Wallboard is used as a substrate for tiles, the sheets must be fastened with screws only. Adhesive/fastener fixing is not acceptable.

Refer to fixing details later in this guide for specific fastener positioning based on tile weight.

### Caulking

Caulk all perimeter gaps and penetrations to achieve stated acoustic performance. Use Gyprock Wet Area Acrylic Sealant, Gyprock Fire Mastic or CSR FireSeal.

### Jointing & Finishing

Sheets are to be fitted together neatly at joints. Gaps up to 3mm wide must be filled with a Gyprock Base Coat before jointing.

Refer to the Jointing & Finishing section of this guide for detailed information.

In multi-layer systems, jointing and finishing is required on the outer layer only, on each side of the wall.

### Sheet Fixing Procedures

- Where possible, sheeting should commence from the end facing the open side of the studs. Refer to illustrations for sheeting direction and order.

Figure 13: Sheeting Direction And Recess Joint Location For Vertical Sheeting

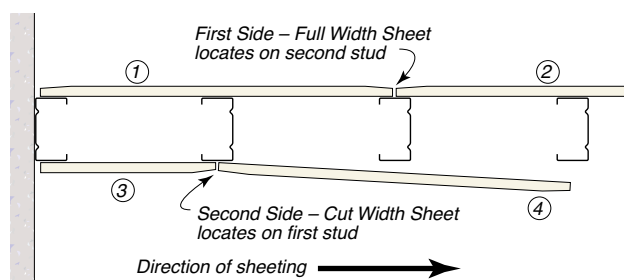
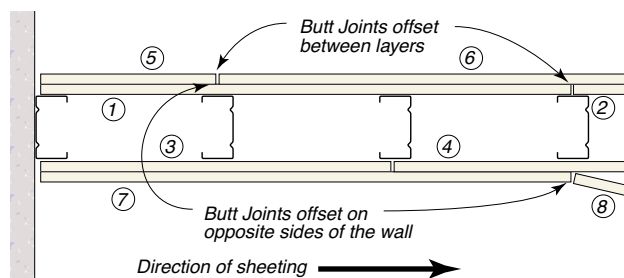
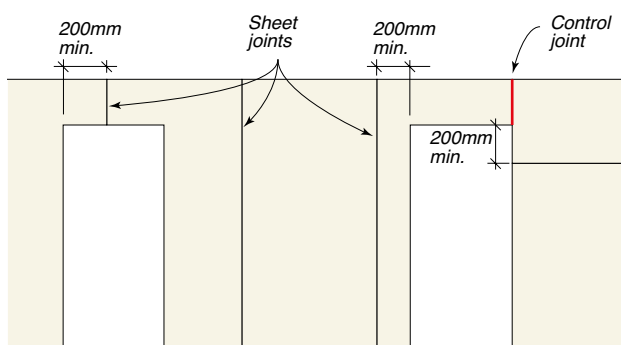


Figure 14: Sheeting Direction And Butt Joint Location For Horizontal Sheeting.



- Walls that are to be tiled must be fastener fixed. Adhesive is not permitted.
- Adhesive daubs must never coincide with fastening points.
- Joints are not to coincide with the edge of openings (eg doorways, windows or vents etc.) except where permitted to form a control joint. Sheets are to be laid so that any joint falls a minimum of 200mm from the edge of an opening. Avoid butt joints over single doorways and cavity sliding doors wherever possible. Refer to the following detail.

Figure 15: Joint Layout For Vertical Or Horizontal Sheeting



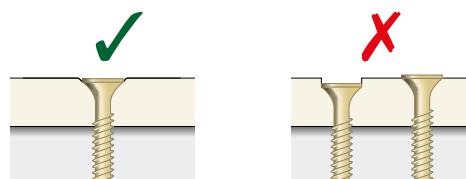
- Do not fasten sheets to the head tracks in stud wall systems.
- Do not fix sheets to steel framing which is greater than 2.4mm in thickness.
- Nogging is not required behind recessed edge joints in horizontal applications.
- Where possible it is recommended that full length sheets are used to minimise butt joints at sheet ends. Sheets should be butted neatly together, but not forced.
- For single layer systems and the first layer of multiple layer systems, all butt joints must be backed by either a stud or nogging.
- For double layer systems, butt joints in the second layer should be either backed by nogging or stud and fixed as per the system fixing table, or located between framing and fixed using laminating screws as per the system fixing table.
- Where butt joints at sheet ends are permitted and unavoidable and where jointing between framing members is not required, as per the Levels of Finish table, butt joints may be formed centrally on a framing member, provided that the framing member has a bearing face equal to or greater than 32mm width for steel framing.
- Where a butt joint in a wall is less than 400mm long and is located more than 2 metres from the floor, then back-blocking may be omitted.
- Butt joints in adjacent sheets on the same side of a wall are to be staggered and located on/between different framing members.
- Where back-blocking of joints is required as per the Levels of Finish table, refer to Back-Blocking Joints section in this guide for installation procedures.
- Ensure that all services and insulation materials are installed (when required), prior to the fixing of sheets to the second side of stud walls.
- Sheets are to be fitted together neatly at joints. Gaps up to 3mm wide must be filled with a Gyprock Base Coat before jointing.
- Where indicated in Table 6, external corners subject to damage are to be protected with a suitable Gyprock metal corner bead attached and finished as per details in the Jointing & Finishing section of this guide.
- In acoustic rated systems, all outer layer joints and corners, including those in non-visible areas such as ceiling voids, must be finished with a minimum of base coat and paper tape.
- In wet areas, approved moisture resistant grade Gyprock plasterboard must be used. Refer to the Gyprock Selection Table in the Components section of this guide.

### Fixing Plasterboard

All fasteners are to be driven home with the head slightly below the surface of the sheet, but not punched through the face linerboard. Best results are obtained using a screw gun. Care should be taken to avoid damaging the face or core of the plasterboard.

Do not overdrive fasteners.

Figure 16: Fastener Driving – Plasterboard



### Butt Joints Off Framing

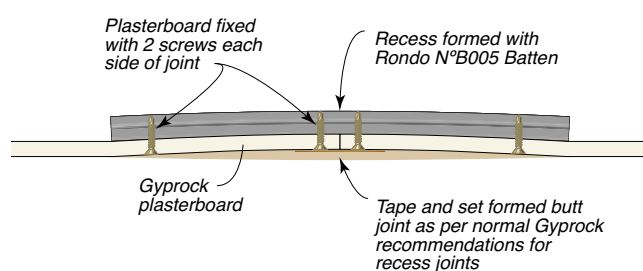
Butt joints are normally formed on framing. However, for single layer plasterboard systems for Levels of Finish 4 and 5, the joints must be formed between framing.

Where mid-span butt or end joints are not required but are used to minimise plasterboard wastage, these joints must also be back-blocked.

Sheet ends should be neatly cut and butted together within 50mm of the centre line between the framing.

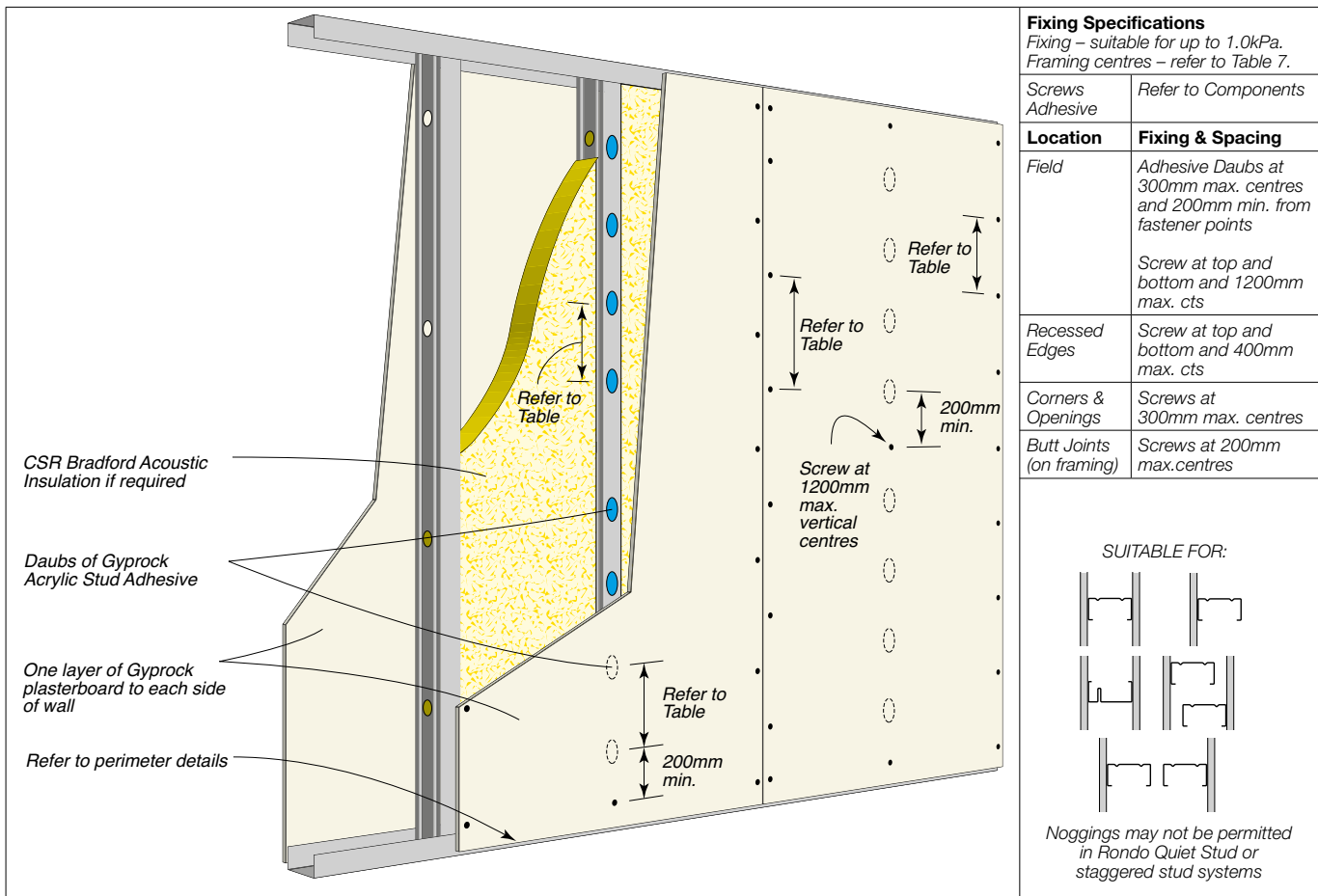
To form a suitable depression, screw fix Rondo B005 battens at 300mm maximum centres behind the joint as detailed below. Install screws to batten carefully. Collated screw guns may not be suitable.

Figure 17: Forming Butt Joints Off Framing Using B005 Batten



Other proprietary systems may also be suitable.

Figure 18: Non-Fire Grade Plasterboard Fixing – Vertical Sheeting – Adhesive/Fastener Fixing – Non-Tiled Areas



**Notes On Fixing**

- Offset joints on opposite sides of the wall by one stud spacing.
- Cut sheets as necessary to provide up to 10mm gap at the bottom and appropriate clearance at the top.
- Do not fix sheets to the top tracks, fix to studs only.
- If butt joints are required, they must be staggered by 600mm minimum in adjacent sheets, backed by noggings and fixed as per the fixing table.
- Daubs of adhesive must be 200mm minimum from fastening points.
- Place edge fasteners at 10 to 16mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

- Apply sheets vertically (paper bound edges parallel with studs), leaving a 10mm max. gap between the bottom of the sheet and the floor, and with recess joints centred on stud flanges.
- Press the sheet firmly against the studs and screw fix recessed edges to the studs at 100mm maximum from top and bottom of sheet (but not through top track) and as per the Fixing Specifications Table.
- Screw fix to intermediate stud at 100mm maximum from top and bottom of sheet (but not through top track) and as per the Fixing Specifications Table.
- Screw fix butt joints, corners and around openings as per the Fixing Specifications Table.

**Fixing Procedure**

For fastener specifications refer to Components section.

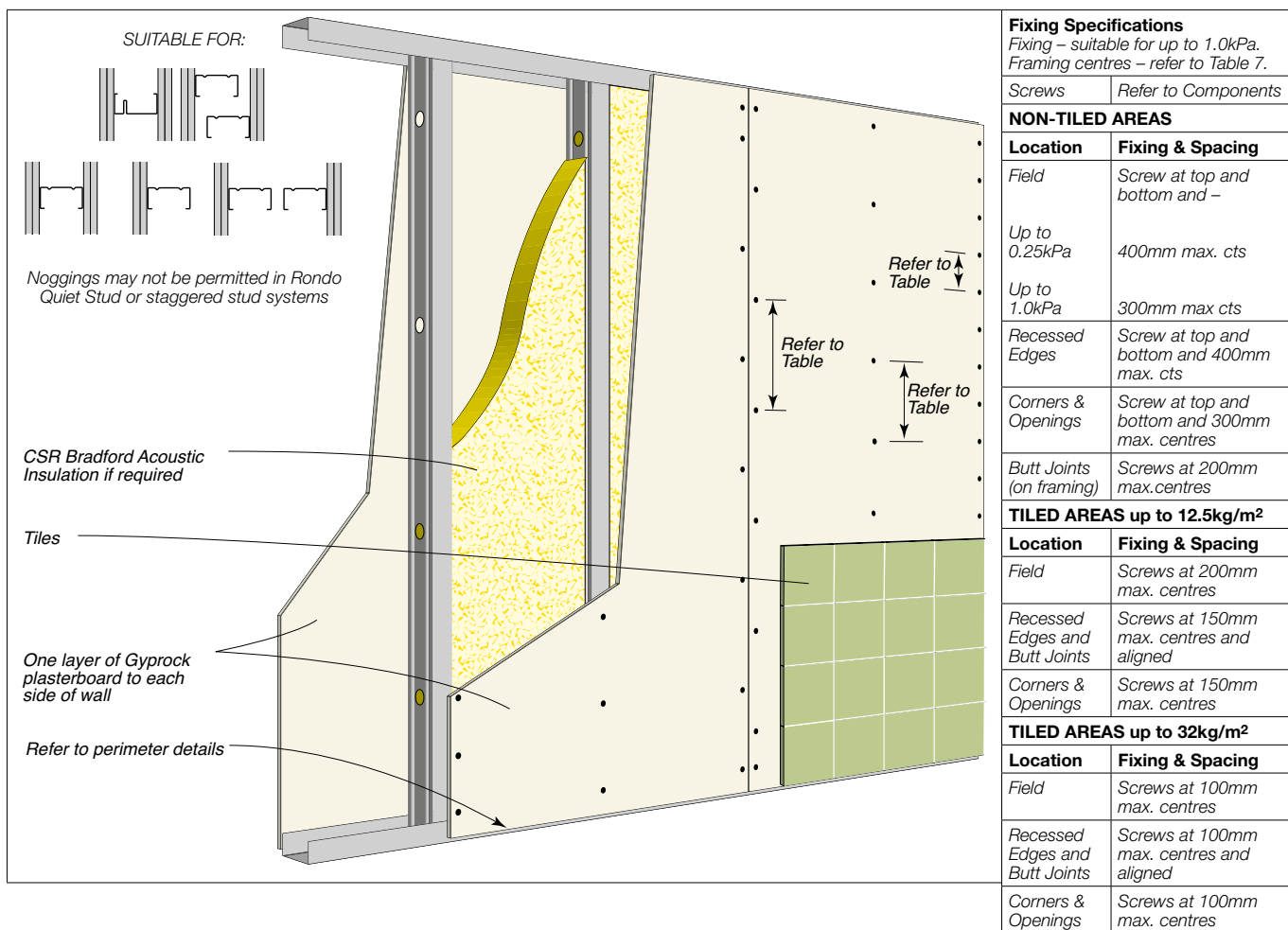
**First Side**

- Apply stud adhesive to intermediate studs. Using a broadknife apply daubs 25mm diameter x 15mm high at 200mm minimum from fastening points as per the Fixing Specifications Table.

**Second Side**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Cut the first sheet so that joints on opposite sides of the wall are located on different studs.
- Apply stud adhesive to intermediate studs and screw fix this sheet to studs as per previous side.
- Adhesive and fastener fix subsequent sheets as per instructions for the first side.

Figure 19: Non-Fire Grade Plasterboard Fixing – Vertical Sheeting – Fastener Fixing – Tiled Or Non-Tiled Areas



**Notes On Fixing**

- Offset joints on opposite sides of the wall by one stud spacing.
- Cut sheets as necessary to provide up to 10mm gap at the bottom and appropriate clearance at the top.
- Do not fix sheets to the top tracks, fix to studs only.
- If butt joints are required, they must be staggered by 600mm minimum in adjacent sheets, backed by nogging and fixed as per the Fixing Specifications Table.
- Place edge fasteners at 10 to 16mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side**

- Apply sheets vertically (paper bound edges parallel with studs), leaving a 10mm max. gap between the bottom of the sheet and the floor, and with recess joints centred on stud flanges.
- Press the sheet firmly against the studs and screw fix recessed joints at 100mm maximum from top and bottom of sheet (but not through top tracks) and as per the Fixing Specifications Table. Do not fix to intermediate studs at this time.

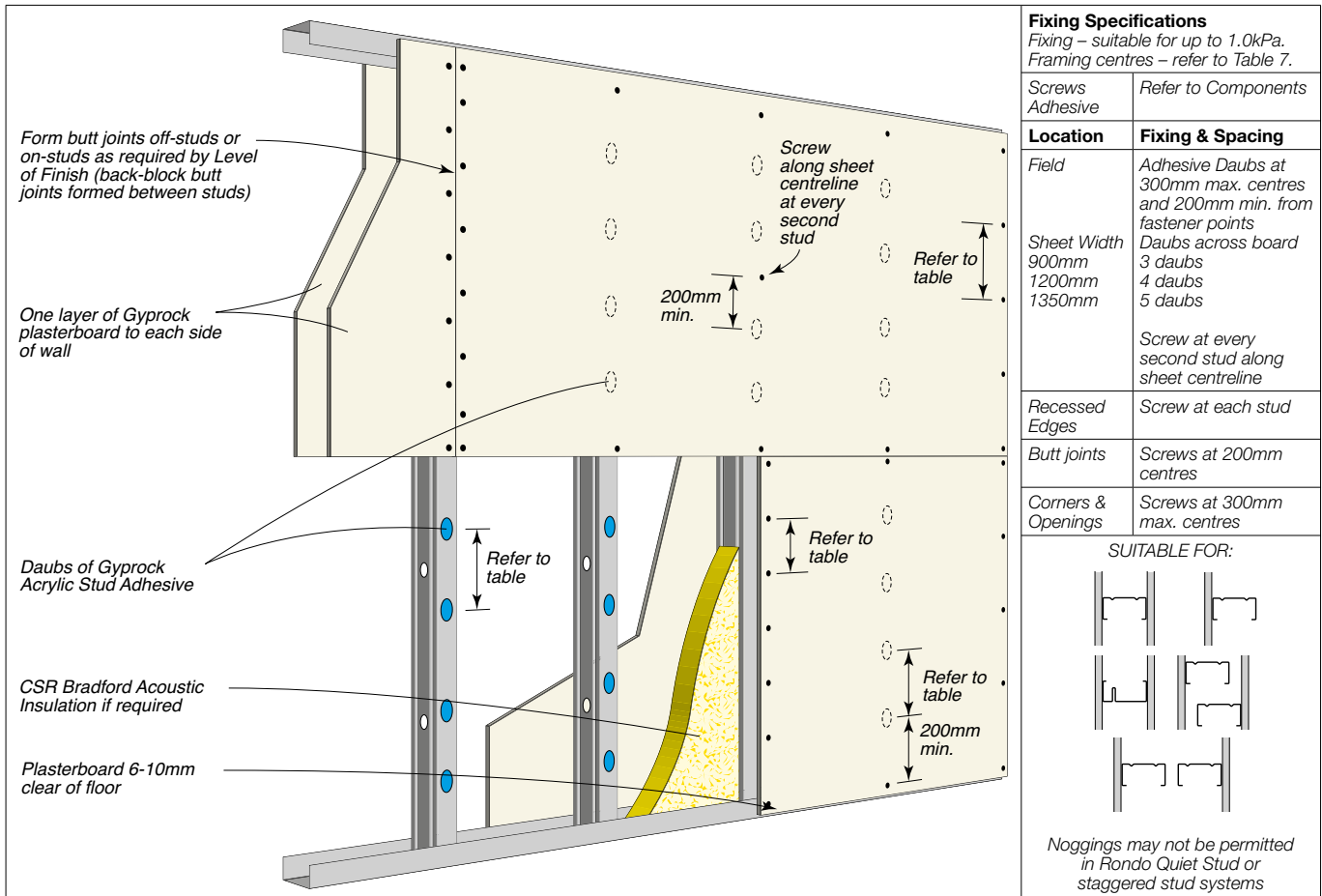
- Screw fix at butt joints, corners and around openings as per the Fixing Specifications Table.

**Second Side**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Cut the first sheet to half width so that joints on opposite sides of the wall are located on different studs.
- Screw fix to all studs at 100mm maximum from top and bottom of sheet (but not through top tracks) and as per the Fixing Specifications Table.
- Screw fix at butt joints, corners and around openings as per the Fixing Specifications Table.

Return to the first side and screw fix sheets to intermediate studs as per the Fixing Specifications Table.

Figure 20: Non-Fire Grade Plasterboard Fixing – Horizontal Sheeting – Adhesive/Fastener Fixing – Non-Tiled Areas



**Notes On Fixing**

- Butt joints in adjacent sheets and on opposite sides of the wall must be staggered by a minimum of one stud spacing
- For a level 4 and 5 finish, butt joints must be formed between studs and back-blocked.
- Do not fix sheets to the top tracks, (fix to studs only).
- Daubs of adhesive must be 200mm minimum from fastening points.
- Place edge fasteners at 10 to 16mm from butt join or 10 to 25mm from recessed edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side**

- Apply stud adhesive to intermediate studs. Using a broadknife apply daubs 25mm diameter x 15mm high at 200mm minimum from fastening points and as per the Fixing Specifications Table.
- Apply sheets horizontally (paper bound edges at right angles to studs), leaving a 10mm max. gap between the bottom of the sheet and the floor, and with butt joints centred on stud flanges.

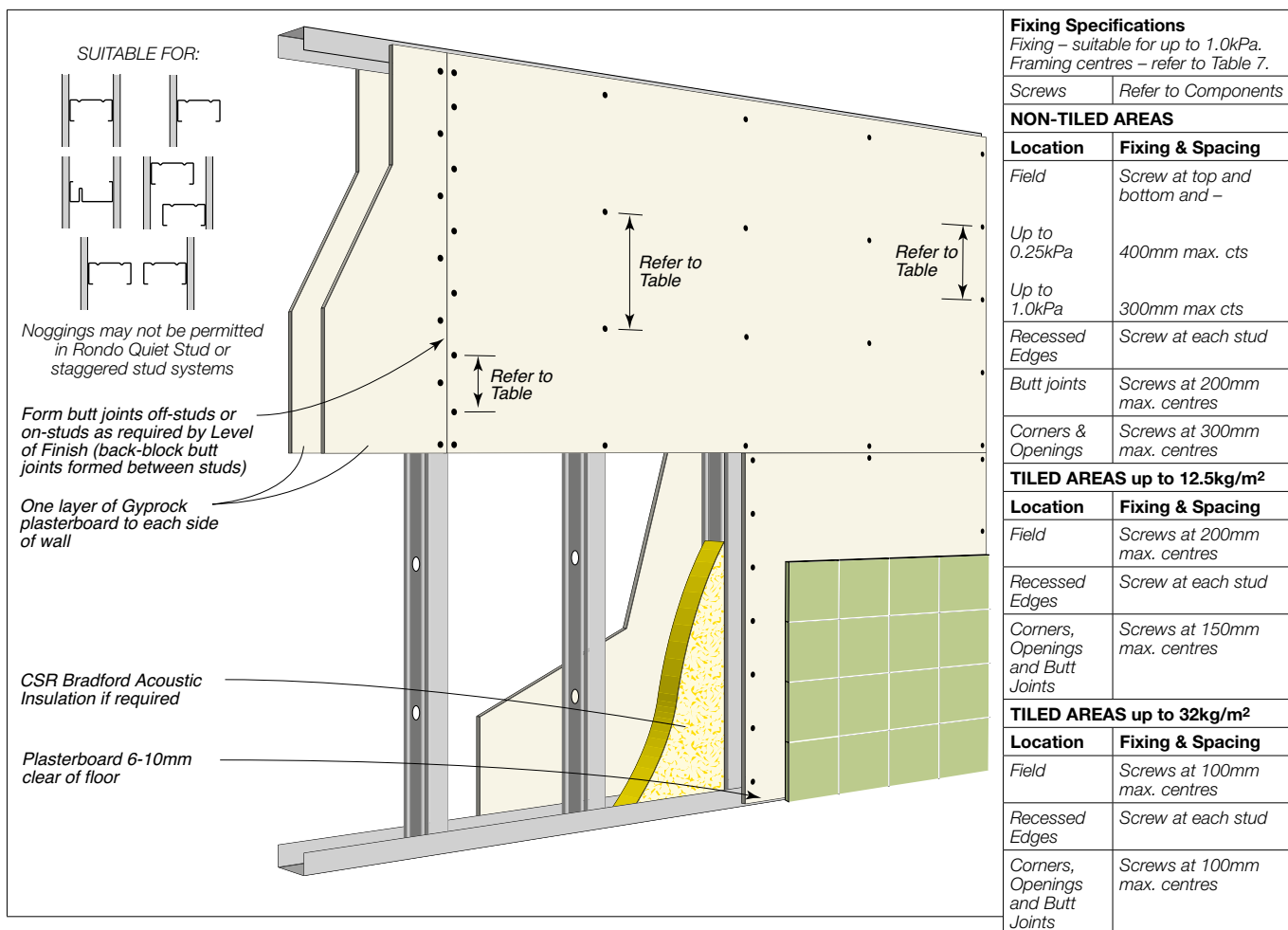
- Screw fix to each stud along one recessed edge, beginning at the centre of the sheet and working towards the ends.
- Press the sheet firmly against the studs and screw fix to each stud along the second recessed edge. Do not fix through top tracks.
- Hold the sheet firmly against the studs, and screw fix along the centreline of the sheet at every second stud.
- Screw fix butt joints as per the Fixing Specifications Table.
- Screw fix at all corners and around openings as per the Fixing Specifications Table.
- Apply the next row of sheets, cutting the first sheet so that butt joints will be offset from adjacent sheets by a minimum of one stud spacing.
- Cut sheets as necessary to ensure appropriate clearance is provided at the head.

**Second Side**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Cut sheets as necessary so that butt joints in adjacent sheets and on opposite sides of the wall are staggered on different studs.
- Apply and fix sheets as detailed for the first side.



Figure 21: Non-Fire Grade Plasterboard Fixing – Horizontal Sheeting – Fastener Fixing – Tiled Or Non-Tiled Areas



**Notes On Fixing**

- Butt joints in adjacent sheets and on opposite sides of the wall must be staggered by a minimum of one stud spacing
- For a level 4 and 5 finish, butt joints must be formed between studs
- Do not fix sheets to the top tracks, (fix to studs only).
- Place edge fasteners at 10 to 16mm from butt join or 10 to 25mm from recessed edge.
- To avoid stud distortion, sheeting should commence from the end facing the open side of the studs.

- Where butt joints on framing are permitted, screw fix butt joints as per the Fixing Specifications Table.
- Screw fix at all corners and around openings as per the Fixing Specifications Table.
- Apply the next row of sheets, cutting the first sheet so that butt joints will be offset from adjacent sheets by a minimum of one stud spacing.
- Cut sheets as necessary to ensure appropriate clearance is provided at the head.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side**

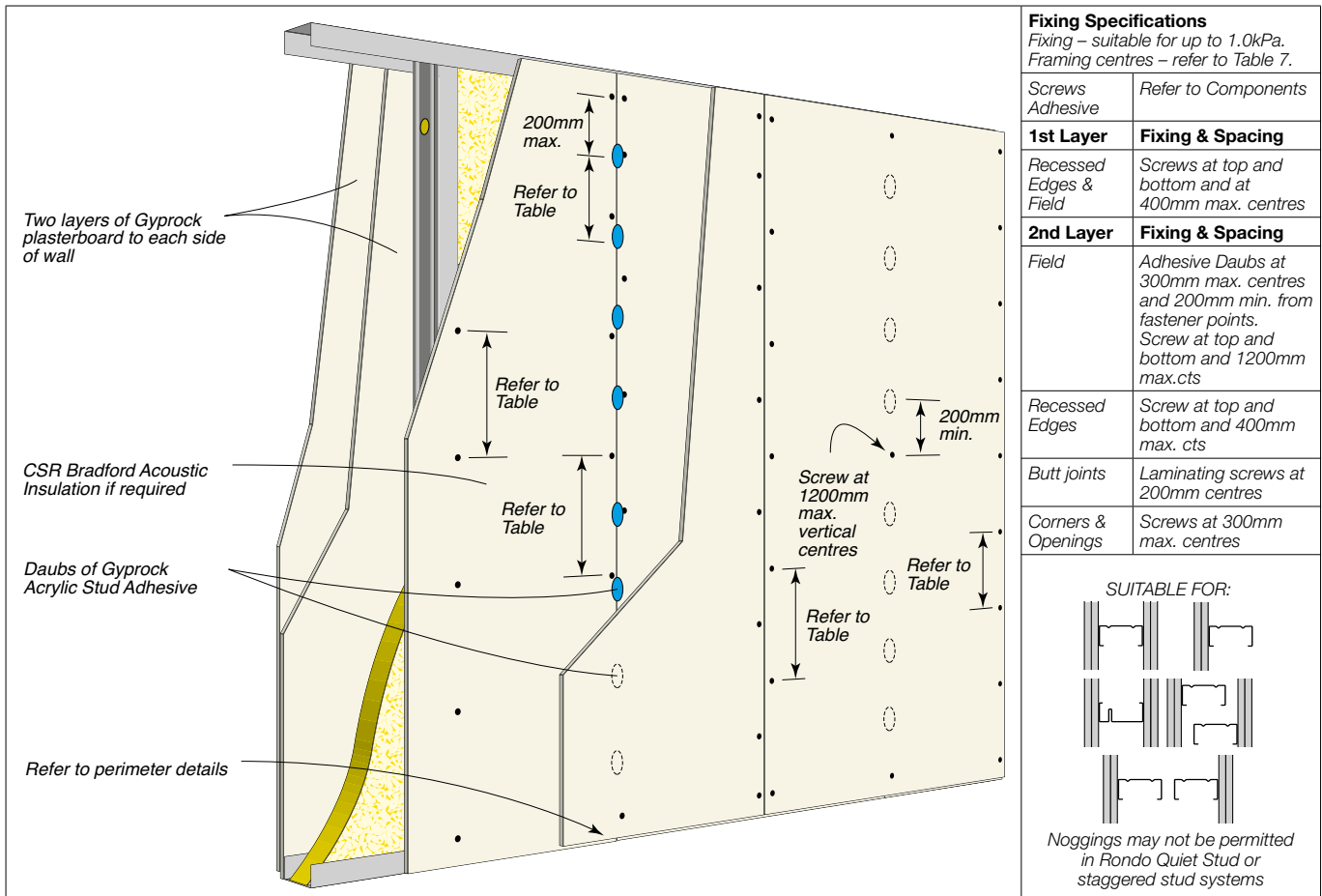
- Apply sheets horizontally (paper bound edges at right angles to studs), leaving a 10mm max. gap between the bottom of the sheet and the floor where an acoustic seal is required
- Screw fix to each stud, beginning at the centre of the sheet and working towards the ends and edges. Alternatively, start at one edge and work across the sheet to the other edge.
- Screw fix as per the Fixing Specifications Table. Do not fix through top tracks.

**Second Side**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Cut sheets as necessary so that butt joints in adjacent sheets and on opposite sides of the wall are staggered on different studs.
- Apply and fix sheets as detailed for the first side.



Figure 22: Non-Fire Grade Plasterboard Fixing – Two Layer – Vertical Sheeting – Adhesive/Fastener Fixing – Non-Tiled Areas



**Notes On Fixing**

- First layer is installed vertically and fully screw fixed (no adhesive). Second layer is fixed with adhesive and screws, and sheets may be installed vertically or horizontally. Refer to Figure 20 for horizontal fixing.
- If butt joints are required, they must be backed by noggings in the first layer, and staggered by 600mm minimum in adjacent sheets and between layers.
- Provide up to a 10mm gap at the bottom of outer sheets, and an appropriate clearance at the top.
- Place edge fasteners at 10 to 16mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side – First Layer**

- Apply sheets vertically (paper bound edges parallel with studs), with the bottom edge of the sheet on the floor, and with recess joints centred on stud flanges.
- Press the sheet firmly against the studs and screw fix at top and bottom (but not through top tracks) and as per the Fixing Specifications Table along all studs.
- Screw fix at all corners and around openings as per the Fixing Specifications Table.

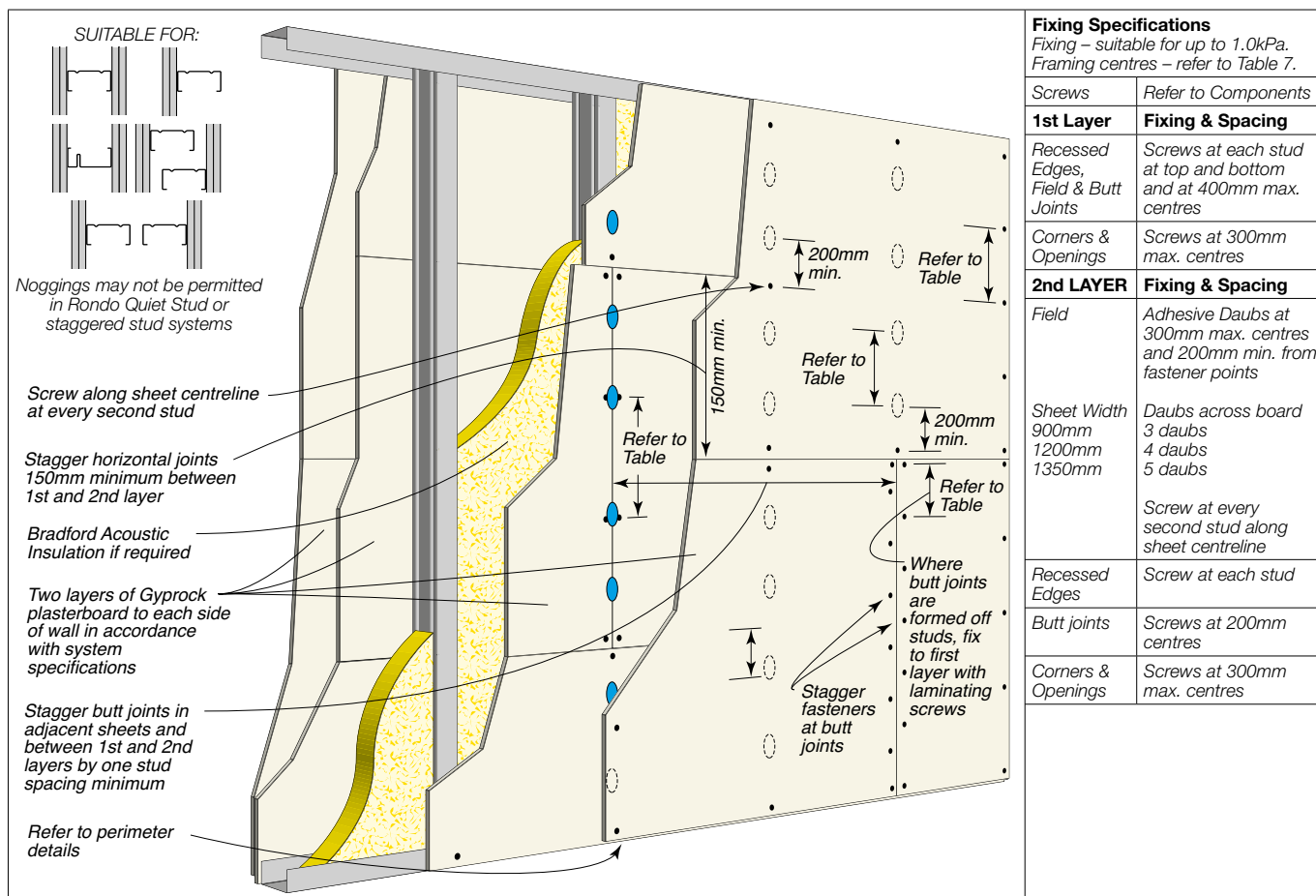
**Second Side – First Layer**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Cut the first sheet so that joints on opposite sides of the wall are located on different studs.
- Screw fix this and subsequent full width sheets as detailed for the first side.

**Both Sides – Second Layer**

- Cut the first sheet so that joints in the second layer do not align with joints in the first layer.
- Apply stud adhesive over intermediate studs. Using a broadknife apply daubs 25mm dia. x 15mm high at 200mm min. from fastening points and as per the Fixing Specifications Table.
- Apply sheets vertically, leaving a 10mm max. gap at the floor. Press sheets firmly against the studs and screw fix recessed edges at top and bottom (but not through top tracks) and as per the Fixing Specifications Table.
- Press sheets firmly against the studs and screw fix to intermediate stud at top and bottom (but not through top track) and at 1200mm maximum vertical centres.
- Screw fix at all corners and around openings as per the Fixing Specifications Table.

Figure 23: Non-Fire Grade Plasterboard Fixing – Two Layer – Horizontal Sheeting – Adhesive/Fastener Fixing – Non-Tiled Areas



**Notes On Fixing**

- First layer is installed horizontally and fully screw fixed (no adhesive). Butt joints may align vertically.
- Second layer is fixed with adhesive and screws with butt joints staggered in adjacent sheets by one stud spacing minimum and between layers. Horizontal joints must be offset 150mm min. between layers on the same side.
- Provide up to a 10mm gap at the bottom of outer sheets, and an appropriate clearance at the top.
- Place edge fasteners at 10 to 25mm from recessed edges and 10 to 16mm from butt joints. Do not fix through top tracks.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

**Fixing First Side – First Layer**

- Apply sheets horizontally (paper bound edges at right angles to studs), leaving a 10mm max. gap between the bottom of the sheet and the floor where an acoustic seal is required. Cut sheets to width in order to offset horizontal joints in the second layer.
- Screw fix to each stud as per the Fixing Specifications Table, beginning at the centre of the sheet and working towards the ends and edges. Alternatively, start at one end and work across the sheet to the other end.
- Screw fix at all corners and around openings as per the Fixing Specifications Table.

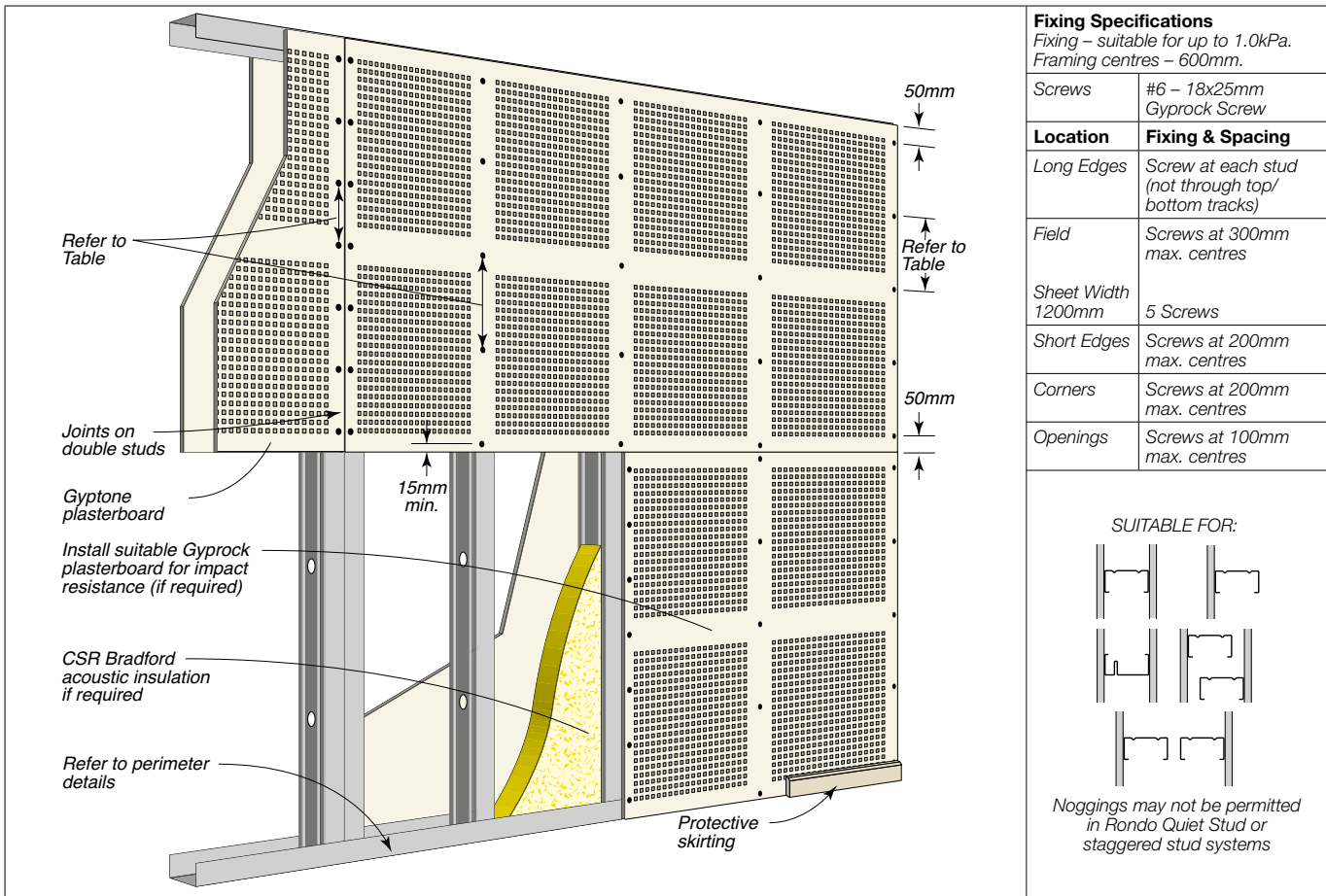
**Second Side – First Layer**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Screw fix sheets as detailed for the first side. Horizontal joints and butt joints may align with those on the other side.

**Both Sides – Second Layer**

- Cut the first sheet so that joints in the second layer do not align with joints in the first layer.
- Apply stud adhesive over intermediate studs. Using a broadknife apply daubs 25mm dia. x 15mm high at 200mm min. from fastening points and as per the Fixing Specifications Table.
- Apply sheets horizontally, leaving a 10mm max. gap between the bottom of the sheet and the floor, and with butt joints centred on stud flanges.
- Screw fix to each stud along one recessed edge, beginning at the centre of the sheet and working towards the ends. Press the sheet firmly against the studs and screw fix to each stud along the second recessed edge.
- Hold the sheet firmly against the studs, and screw fix along the centreline of the sheet at every second stud.
- Screw fix butt joints, corners and around openings as per the Fixing Specifications Table.
- Cut sheets as necessary to ensure appropriate clearance is provided at the head.

Figure 24: Non-Fire Grade Gyptone Perforated Plasterboard Fixing To Steel Framing – Horizontal Sheeting – Fastener Fixing – Non-Tiled Areas



### Design Considerations

- All Gyptone boards are 2400 x 1200 x 12.5mm.
- Determine the wall area.
- When required, plan for a decorative border using 13mm Gyprock Standard Plasterboard.
- Gyptone boards are not suitable for impact resistant applications. Alternative linings may be used for the lower parts of a wall

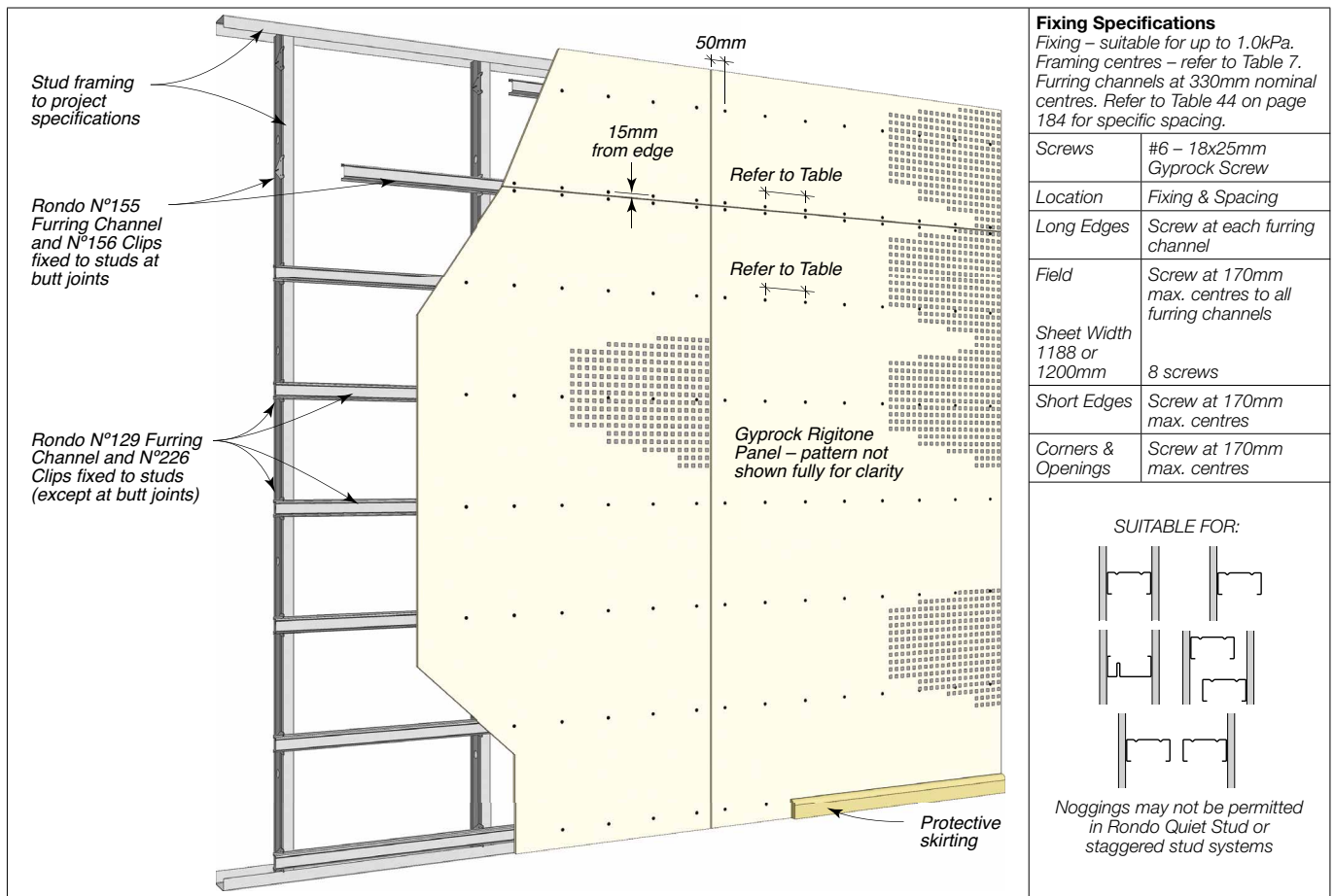
### Installation Overview

- Gyptone boards must be installed with the long edges at right angles to the wall stud framing and ends of boards must be supported by wall studs.
- Stagger butt joints a minimum of one stud spacing between adjacent sheets.
- Screw fix boards, in accordance with this guide.
- Boards should be butted hard against each other and aligned appropriately.
- Allow for a border using 13mm Standard Gyprock Plasterboard (when required).
- Tape and set all joints with Gyprock Paper Tape and standard 3 coat Gyprock compound system.
- Cover all screw heads.
- Sand joints and screw heads.
- Paint as required.

### Fixing Procedure

- Always fasten the short edges of the board first, then the long edges and body. Ensure boards are level and in full contact with the wall stud framing before screw fixing.
- Ensure subsequent boards are all laid in the same direction.
- Screw fix boards in place using Gyprock 6g x 25mm needle point screws at 15mm min. from board edges and 50mm minimum from corners. Fix sheets as per the Fixing Specifications Table.

Figure 25: Non-Fire Grade Rigitone Perforated Plasterboard Fixing To Furring Channels – Vertical Sheeting – Fastener Fixing – Non-Tiled Areas



**Design Considerations**

- When required, plan for a decorative border using 13mm Gyprock Standard Plasterboard
- Plan the furring channel layout based on Table 44 and the size of any decorative border.
- Rigitone boards are not suitable for impact resistant applications.

**Installation Overview**

- Rondo N°155 furring channels must be used at all board joints. Rondo N°129 furring channels are narrower and may be used at other locations.
- Install boards from the centre of the room with the long edge of the boards at right angles to the furring channels and ends of boards must be supported by furring channels.
- Use the pattern specific spacer tool to ensure the correct alignment of adjacent boards.
- For all cut boards, bevel the cut edges, then paint the edges with Rigitone Primer.
- Fill gaps between boards and cover all screw heads using Rigitone Filler. Scrape off excess and sand smooth.
- Paint and finish as required.

**Fixing Procedure**

- Always fasten the short ends of the board first, then the long edges and body.

- Fix boards using Gyprock 6g x 25mm needle point screws at 15mm min. from board ends, 50mm minimum from the long edges, and at 170mm max. centres. Refer to fixing table.
- Ensure boards are level and in full contact with the furring channel before screw fixing.
- Any slight unevenness in the surface under the boards can be compensated by loosening the screws slightly.
- Work outwards from the centre of the room in a star pattern when mounting subsequent boards, making sure that they are all laid in the same direction (see markings on the ends and lettering on the long edges of the boards).

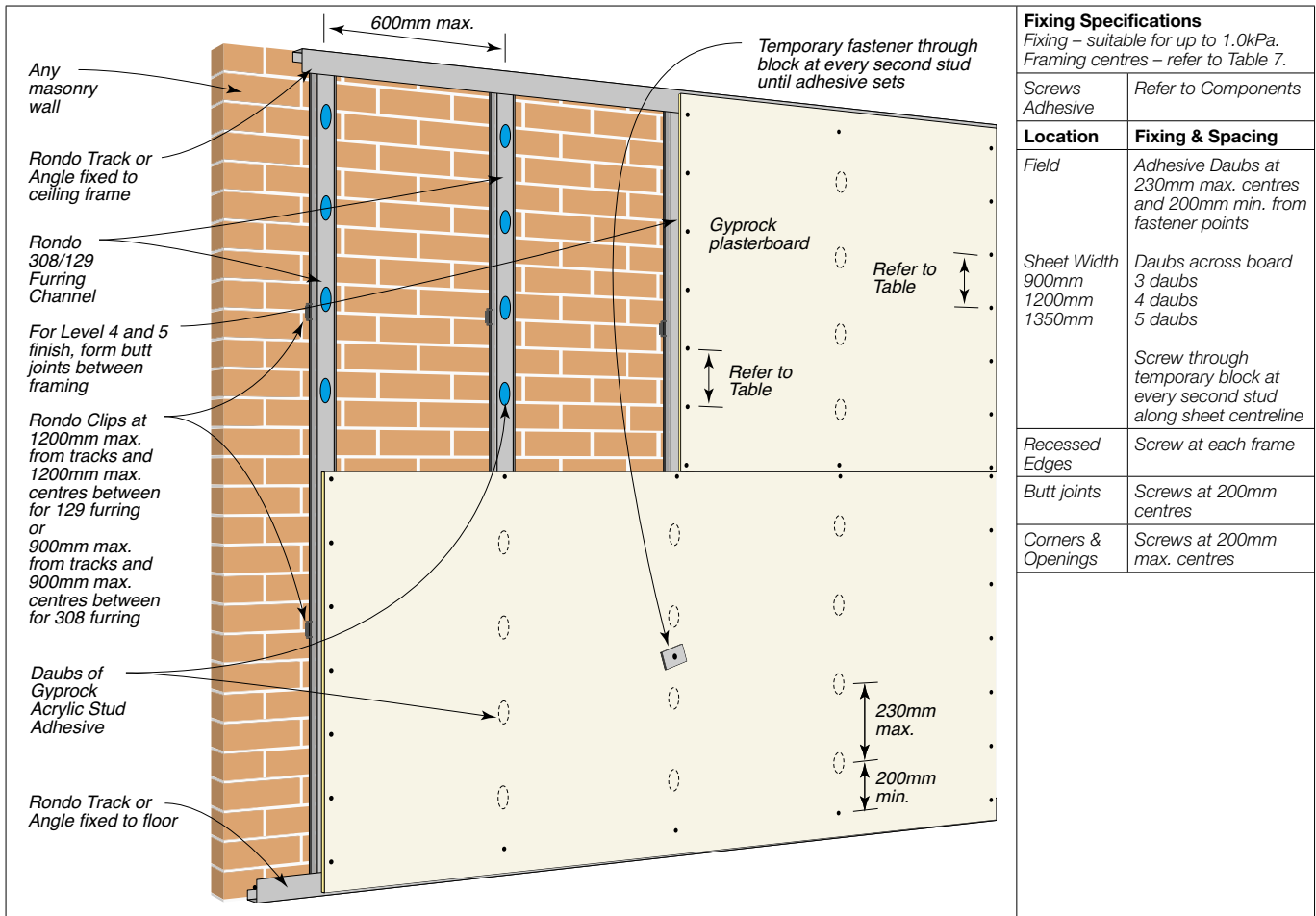
Table 23: Maximum Wall Heights - 0.25kPa – L/240 Deflection Limits

Furring Channel Spacing (nominal)	Stud Size. Depth x BMT (mm)								
	64 x 0.5	64 x 0.75	64 x 1.15	76 x 0.55	76 x 0.75	76 x 1.15	92 x 0.55	92 x 0.75	92 x 1.15
330mm	Stud Spacing = 600mm centres								
	2660	3180	3520	3170	3760	4000	3570	4120	4630
Refer to Table 44	Stud Spacing = 450mm centres								
	2920	3480	3870	3520	4110	4390	4000	4540	5090

- Notes:
- Internal pressures: 0.375kPa Ultimate / 0.25kPa Service.
  - Rondo 129 or 155 Furring channels fitted one side using Rondo 226 clips. 3/#10 tek screws per clip minimum.
  - Install noggings as per Table 21.
  - If linings are terminated short of maximum height, provide noggings at 1200mm centres thereafter.



Figure 26: Non-Fire Grade Plasterboard Fixing To Furring Channel – Horizontal Sheeting – Adhesive/Screw Fixing – Non-Tiled Areas



**Notes On Fixing**

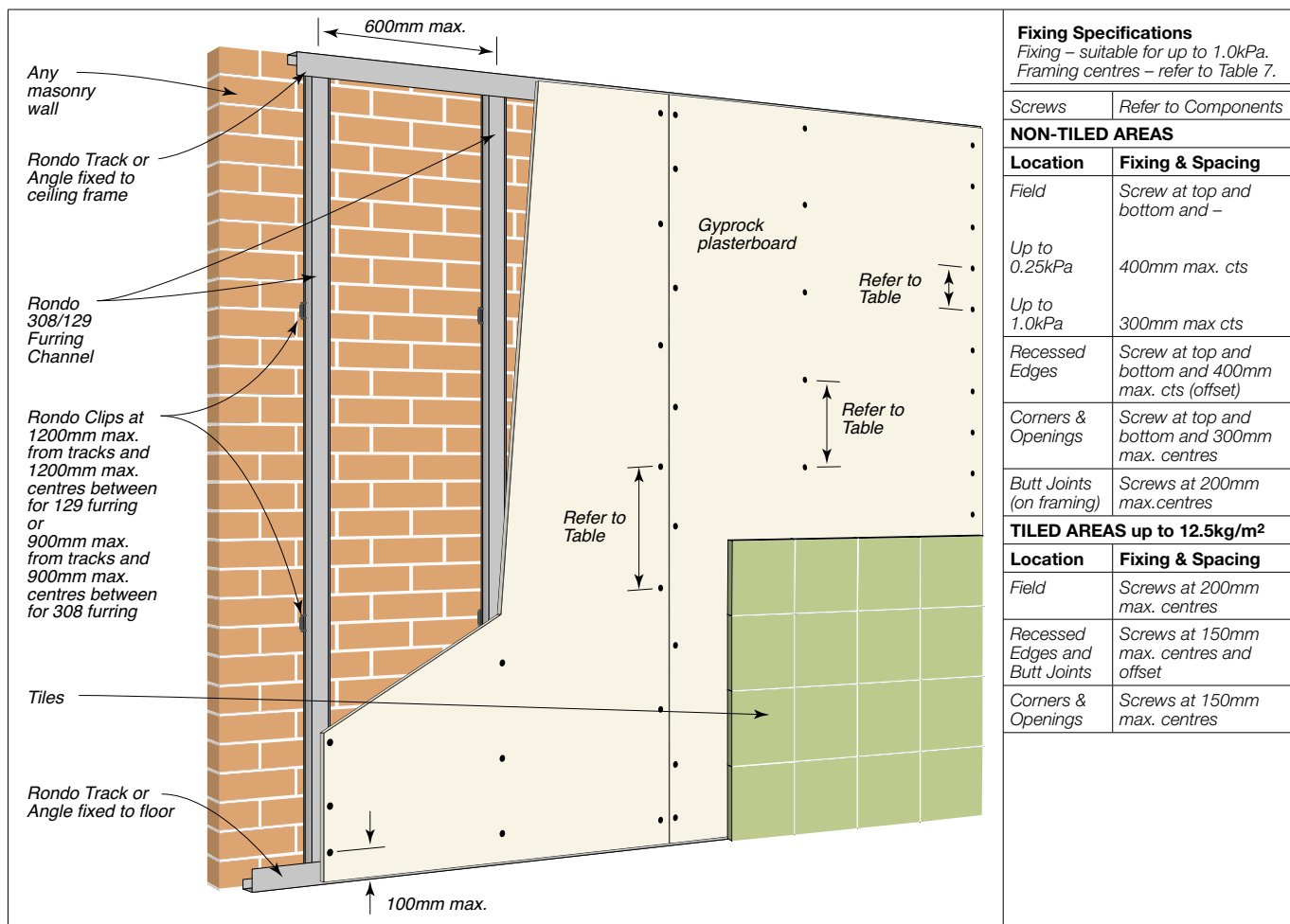
- Cut sheets as necessary to provide up to 10mm gap at the bottom and appropriate clearance at the top.
- Do not fix sheets to the top track or angle, (fix to furring only).
- Daubs of adhesive must be 200mm minimum from fastening points.
- Place edge fasteners at 10 to 10 to 16mm from butt join or 10 to 25mm from recessed edge.
- Butt joints in adjacent sheets must be staggered by a minimum of one frame spacing.
- For a level 4 and 5 finish, butt joints must be formed between framing and back-blocked.

**Fixing Procedure**

For fastener specifications refer to Components section.

- Apply stud adhesive to intermediate furring channels. Using a broadknife apply daubs 25mm diameter x 15mm high at 200mm minimum from fastening points and as per the Fixing Specifications Table.
- Apply sheets horizontally (paper bound edges at right angles to framing), leaving a 10mm max. gap between the bottom of the sheet and the floor, and with butt joints centred on framing. (Refer to Notes On Fixing for butt joints for Level 4 or 5 Finish).
- Screw fix to each furring, beginning at the centre of the sheet and working towards the ends and edges. Alternatively, start at one edge and work across the sheet to the other edge.
- Screw fix edges as per the Fixing Specifications Table.
- Screw fix at all butt joints, corners and around openings as per the Fixing Specifications Table.
- Apply the next row of sheets, cutting the first sheet so that butt joints will be offset from adjacent sheets by a minimum of one frame spacing.
- Cut sheets as necessary to ensure appropriate clearance is provided at the head.

Figure 27: Non-Fire Grade Plasterboard Fixing To Furring Channel – Vertical Sheeting – Fastener Fixing – Tiled Or Non-Tiled Areas



**Notes On Fixing**

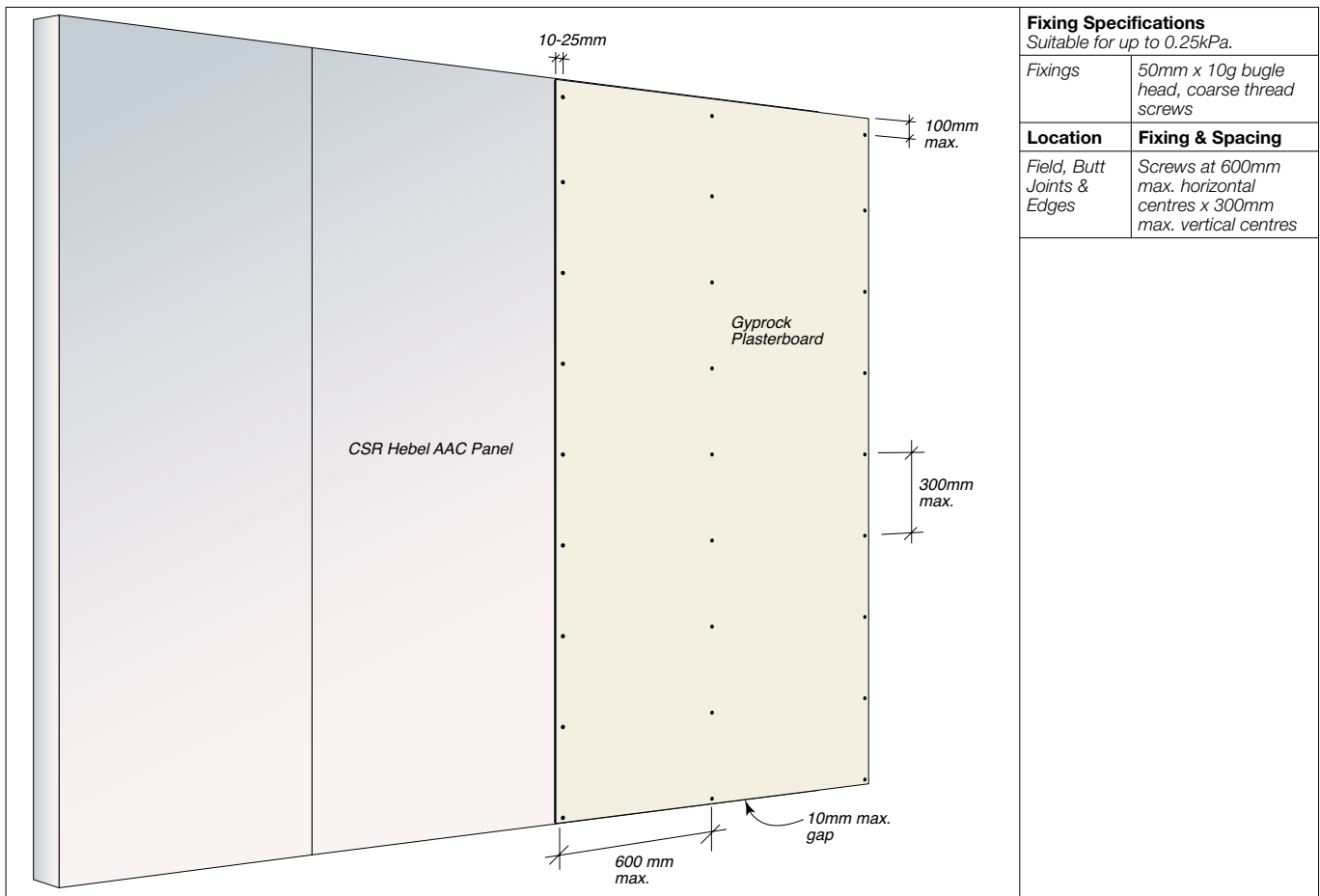
- Cut sheets as necessary to provide up to 10mm gap at the bottom and appropriate clearance at the top.
- Do not fix sheets to the top track or angle, fix to furring only.
- If butt joints are required, they must be staggered by 600mm minimum in adjacent sheets, backed by framing and fixed as per the fixing table.
- Place edge fasteners at 10 to 16mm from sheet edge.

**Fixing Procedure**

For fastener specifications refer to Components section.

- Apply sheets vertically (paper bound edges parallel with furring), leaving a 10mm max. gap between the bottom of the sheet and the floor, and with recess joints centred on furring.
- Press the sheet firmly against the framing and screw fix recessed edges at 100mm maximum from top and bottom of sheet (but not through top tracks) and as per the Fixing Specifications Table.
- Screw fix field of plasterboard at 100mm maximum from top and bottom of sheet and as per the Fixing Specifications Table.
- Screw fix at butt joints, corners and around openings as per the Fixing Specifications Table.

Figure 28: Non-Fire Grade Plasterboard Fixing To Hebel AAC Wall – Vertical Sheeting – Screw Fixing – Non-Tiled Areas



**Notes On Fixing**

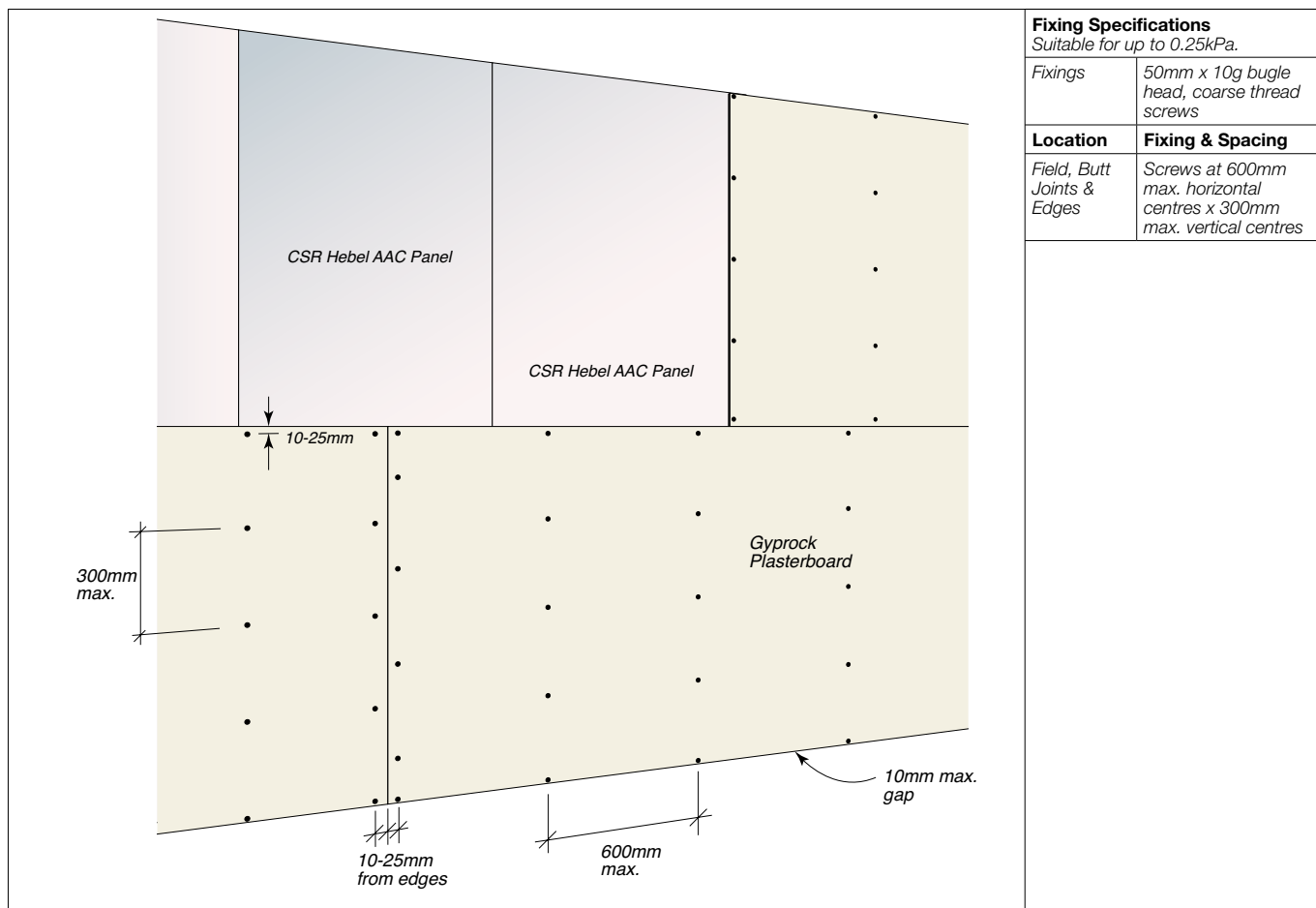
- Cut sheets as necessary to provide up to 10mm gap at the bottom where required for fire or acoustic sealing, and with appropriate clearance at the top.
- If butt joints are required, they must be staggered by 450mm minimum in adjacent sheets and fixed as per the fixing table.
- Place edge fasteners at 10 to 25mm from sheet edge.

**Fixing Procedure**

- Apply sheets vertically, leaving a 10mm maximum gap between the bottom of the sheet and the floor.
- Press the sheet firmly against the panels and screw fix recessed joints at 100mm maximum from top and bottom of sheet and as per the fixing table. Screw fix the field of the board as per the Fixing Specifications Table.
- Screw fix at butt joints, corners and around openings as per the Fixing Specifications Table.



Figure 29: Non-Fire Grade Plasterboard Fixing To Hebel AAC Wall – Horizontal Sheeting – Screw Fixing – Non-Tiled Areas



### Notes On Fixing

- Cut sheets as necessary to provide up to 10mm gap at the bottom where required for fire or acoustic sealing, and with appropriate clearance at the top.
- Butt joints must be staggered by 450mm minimum in adjacent sheets and fixed as per the fixing table.
- Place edge fasteners at 10 to 25mm from sheet edges.

### Fixing Procedure

- Apply sheets horizontally, leaving a 10mm maximum gap between the bottom of the sheet and the floor.
- Press the sheet firmly against the panels and screw fix, beginning at the centre of the sheet and working towards the ends and edges. Alternatively, start at one edge and work across the sheet to the other edge. Screw fix the field of the board as per the Fixing Specifications Table.
- Screw fix at butt joints, corners and around openings as per the fixing table.
- Apply the next row of sheets, cutting the first sheet so that butt joints will be offset from adjacent sheets by a minimum of 450mm.
- Screw fix at all corners and around openings as per the Fixing Specifications Table.
- Cut sheets as necessary to ensure appropriate clearance is provided at the head.

# Direct Fixing Plasterboard To Masonry Walls

## Description

Gyprock plasterboard may be used to line dry masonry walls to provide an alternative to cement render and set plaster finishes. Gyprock plasterboard can be laminated directly onto the masonry, including concrete blocks, clay bricks and calcium silicate bricks. Methods are available using Gyprock Masonry Adhesive (in WA, Gyprock Drywall Masonry Adhesive 100), or with Gyprock Acrylic Stud Adhesive in combination with masonry fasteners.

Joint treatment as detailed in the jointing systems section creates a smooth flush surface ready for decoration.

## Design Considerations

Lining masonry with plasterboard is an alternative to solid plaster, not a means of isolating dampness. The adhesive fixing method must not be used where walls are to be tiled.

Services should be installed prior to the Gyprock plasterboard linings being fixed. All wall fixtures must be fastened to the masonry wall, with additional daubs of adhesive around the fixing to avoid distortion of the plasterboard.

Control joints are to be installed in the following locations:

- To correspond with control joints in the masonry.
- Where plasterboard abuts any structural element or dissimilar wall assembly.
- In long wall runs, at not more than 12m centres.
- Between floor levels, e.g. in stairwells.

When lining a true wall surface, an allowance of about 5mm should be made for adhesive thickness.

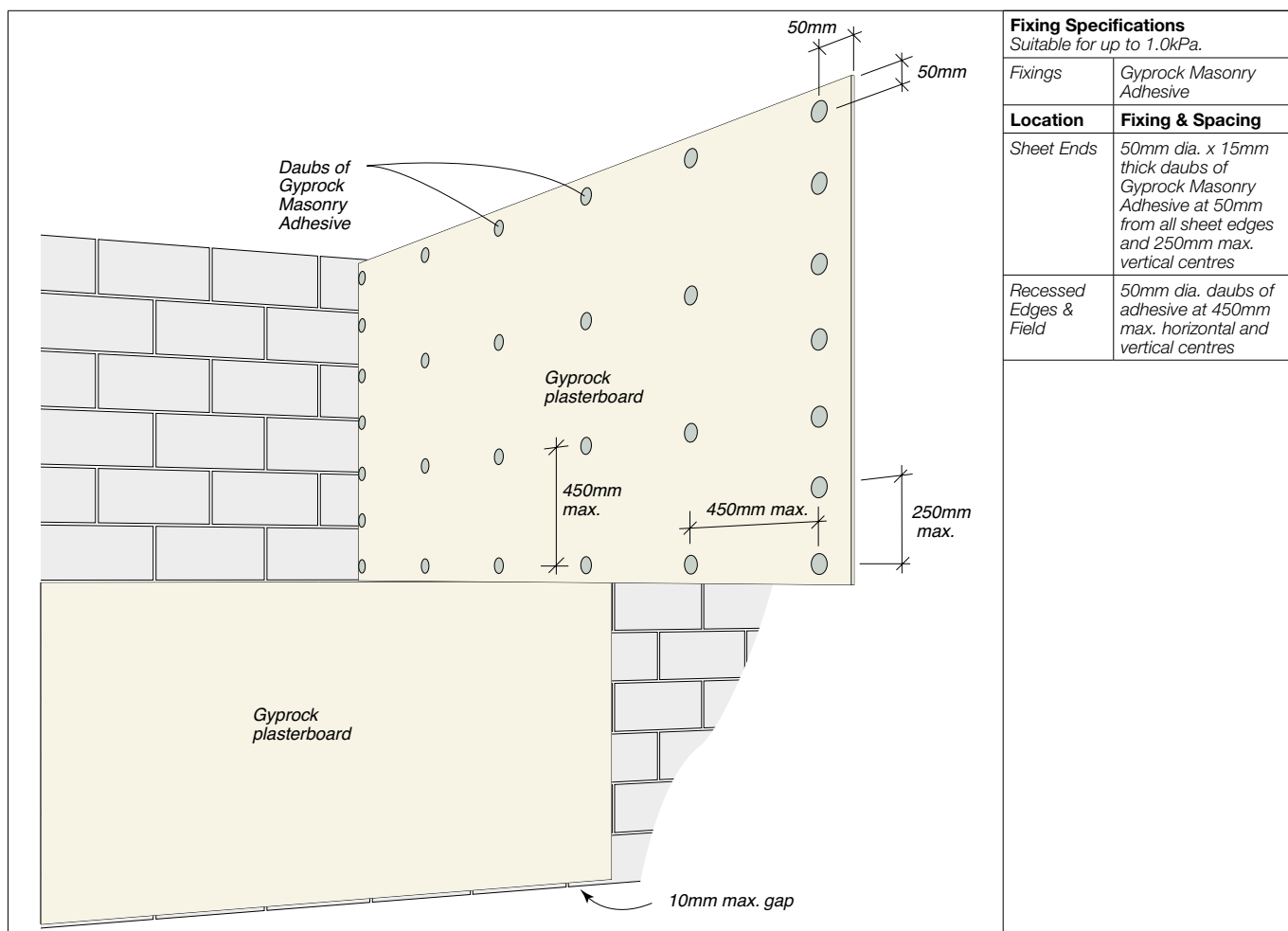
## Installation

All masonry surfaces must be dry before installation of Gyprock plasterboard. Masonry surfaces are to be free of dust, oil, and any other treatment that could reduce adhesion. For painted masonry walls, locally remove paint where adhesive is to be placed. (Tip: Water should be easily absorbed by the masonry surface.)

Plasterboard sheets can be fixed horizontally or vertically, and butt joints must be staggered a minimum of 450mm.

Additional daubs must be applied at butt joints, external corners, and around power points, plumbing fixtures, doors, windows and skirtings.

Figure 30: Plasterboard Fixing To Masonry – Horizontal Sheeting – Gyprock Masonry Adhesive Fixing – Non-Tiled Areas



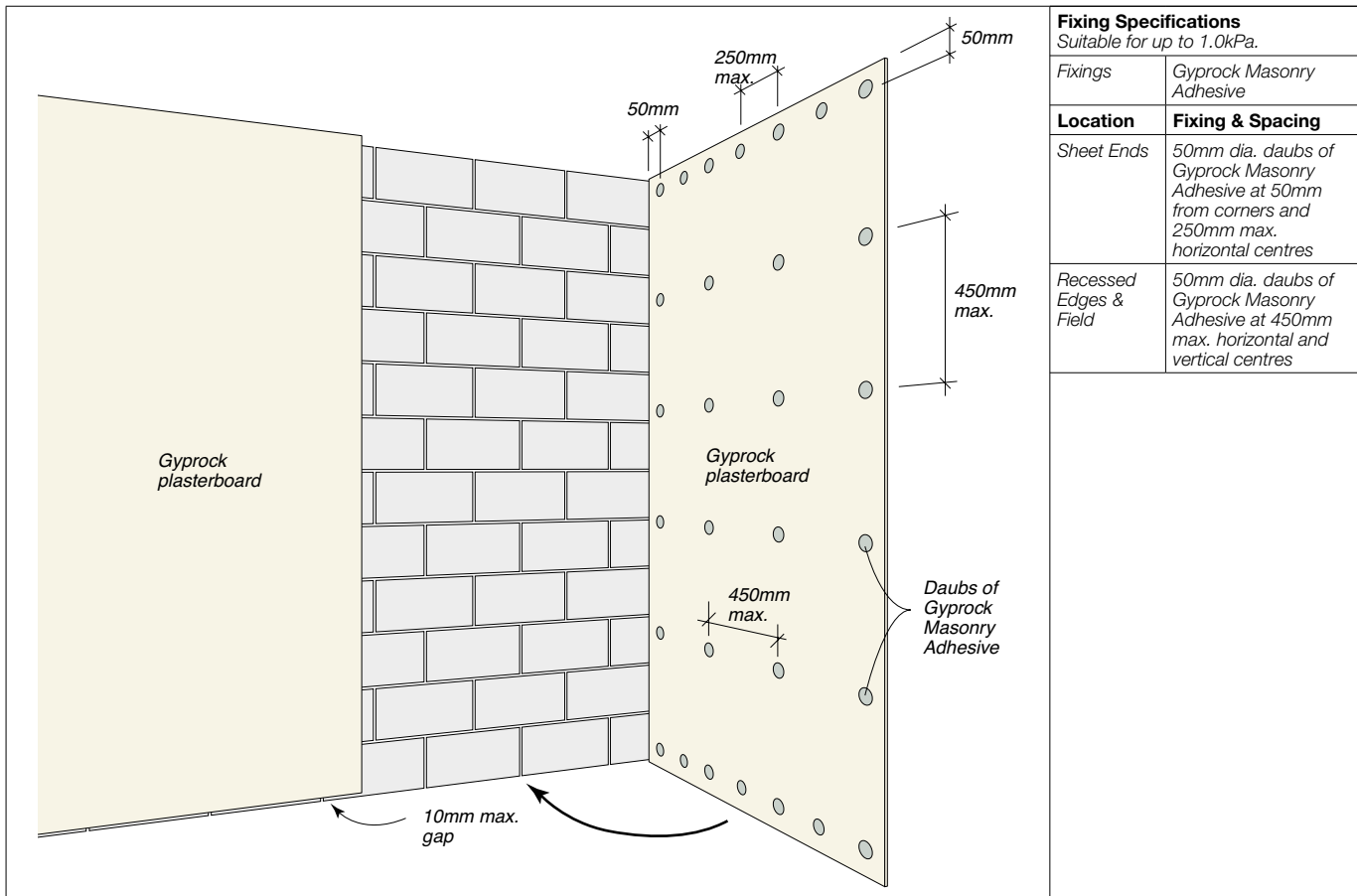
### Notes On Fixing

- Gyprock Masonry Adhesive is a setting type plaster and hardens at a controlled rate after mixing. Mix with water to a thick consistency, and do not use the mix after setting or hardening has commenced. Mix only a sufficient quantity that can be used in about 45 minutes.
- Check alignment of the wall with a straight edge to establish the wall alignment. Strike a chalk line on ceiling and floor for use as a guide to align the face of the Gyprock plasterboard.
- Daubs should be approximately 50mm diameter and minimum 15mm thick. If the wall is out of alignment by up to 15mm, bigger daubs must be used, and levelling pads are to be used where irregularities in the wall surface exceed 15mm.

### Fixing Procedure

- Measure and cut the sheets to fit horizontally or vertically, allowing up to 10mm clearance at top and bottom.
- Daubs of Gyprock Masonry Adhesive can be applied to the wall surface or to the back of the sheets. When applying adhesive daubs to the wall, mark the wall where the sheet edges fall to keep daubs 50mm away from the edges of the sheet.
- If the wall alignment is flat and true, use a 75mm broadknife to apply daubs of adhesive at 50mm from all sheet edges and as per the Fixing Specifications Table vertically and horizontally.
- Position boards and use a straight edge to tamp the boards into alignment both vertically and horizontally. Hold sheets in position for at least 80 minutes to allow adhesive to set with temporary masonry nails through sheet edges. If necessary, use temporary blocks or props to the field of the board.
- Do not disturb the walls or set joints for at least 48 hours.

Figure 31: Plasterboard Fixing To Masonry – Vertical Sheeting – Gyprock Masonry Adhesive Fixing – Non-Tiled Areas



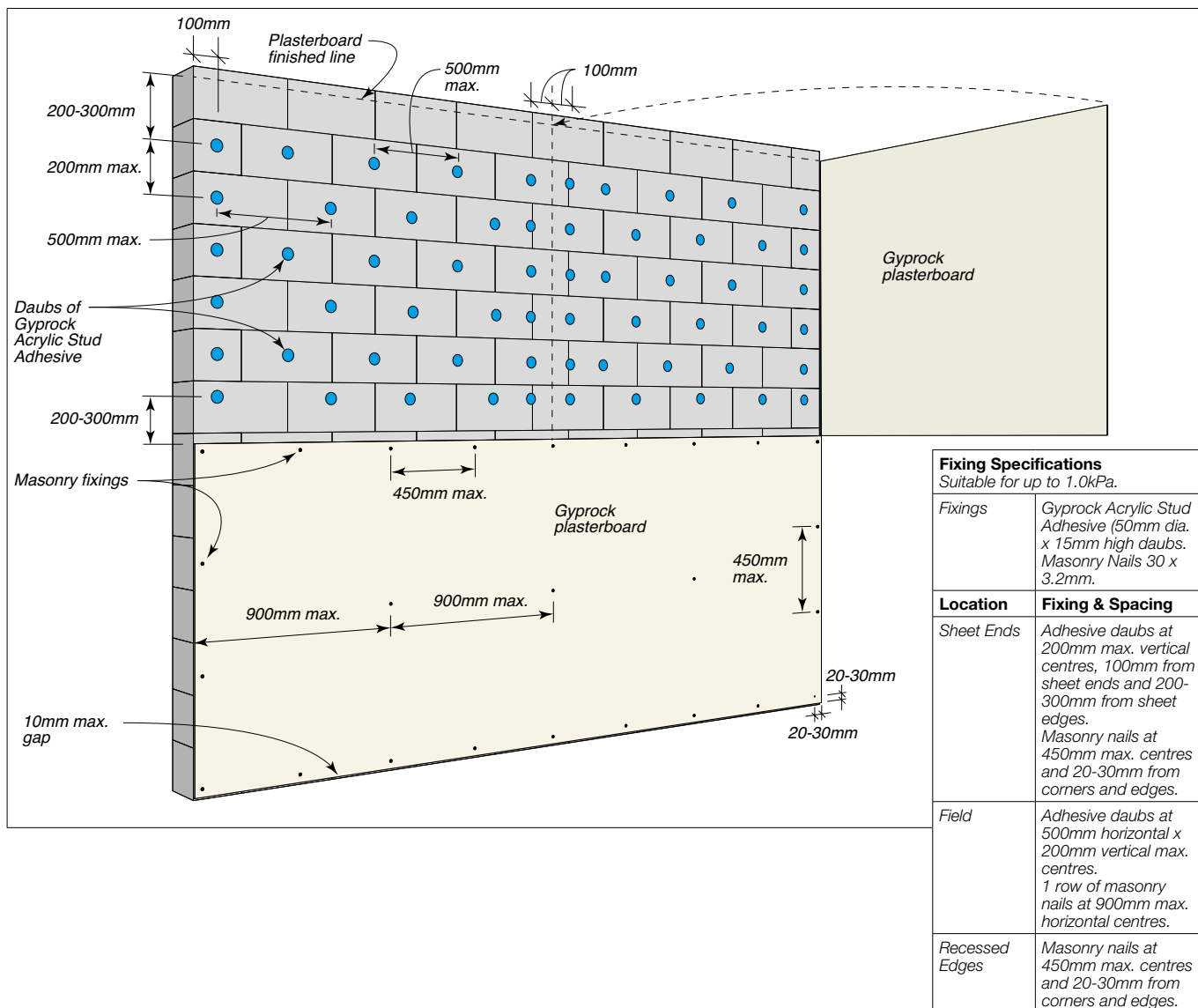
### Notes On Fixing

- Gyprock Masonry Adhesive is a setting type plaster and hardens at a controlled rate after mixing. Mix with water to a thick consistency, and do not use the mix after setting or hardening has commenced. Mix only a sufficient quantity that can be used in about 45 minutes.
- Check alignment of the wall with a straight edge to establish the wall alignment. Strike a chalk line on ceiling and floor for use as a guide to align the face of the Gyprock plasterboard.
- Daubs should be approximately 50mm diameter and minimum 15mm thick. If the wall is out of alignment by up to 15mm, bigger daubs must be used, and levelling pads are to be used where irregularities in the wall surface exceed 15mm.

### Fixing Procedure

- Measure and cut the sheets to fit horizontally or vertically, allowing up to 10mm clearance at top and bottom.
- Daubs of Gyprock Masonry Adhesive can be applied to the wall surface or to the back of the sheets. When applying adhesive daubs to the wall, mark the wall where the sheet edges fall to keep daubs 50mm away from the edges of the sheet.
- If the wall alignment is flat and true, use a 75mm broadknife to apply daubs of adhesive at 50mm from all sheet edges and as per the Fixing Specifications Table vertically and horizontally.
- Position boards and use a straight edge to tamp the boards into alignment both vertically and horizontally. Hold sheets in position for at least 80 minutes to allow adhesive to set with temporary masonry nails through sheet edges. If necessary, use temporary blocks or props to the field of the board.
- Do not disturb the walls or set joints for at least 48 hours.

Figure 32: Plasterboard Fixing To Masonry – Horizontal Sheeting – Fastener & Gyprock Acrylic Stud Adhesive Fixing – Non-Tiled Areas



### Notes On Fixing

- Suitable for accurately built masonry walls such as those of concrete blockwork.
- Gyprock Acrylic Stud Adhesive is coloured blue for easy identification. It can be used in temperatures not less than 5°C.
- Stud adhesive does not constitute a fixing system on its own and it must be used in conjunction with masonry anchors such as concrete nails.
- Daubs should be approximately 50mm diameter and minimum 15mm thick

### Fixing Procedure

- Measure and cut the sheets to fit horizontally or vertically, allowing up to 10mm clearance at top and bottom.
- Mark the wall where the sheet edges fall and use a 75mm broadknife to apply daubs of adhesive to the wall at 100mm from sheet ends, 200 – 300mm from recessed edges, and at 500mm by 200mm maximum centres, typically at the centre of each block. Refer to Fixing Specification table.
- Position boards and install masonry nails through sheet edges at 450mm maximum centres, and to the field of the board at 900mm maximum centres. Daubs of adhesive must not coincide with fastener points.
- Do not disturb the walls or set joints for at least 48 hours.

# Curved Walls

## Applications

Gyprock Flexible Plasterboard has a thickness of 6.5mm, and has been specifically designed for curved wall applications. It is particularly effective for small radius situations (less than 900mm) which cannot be accomplished with other Gyprock plasterboard.

Gyprock Plus and Standard Plasterboard of 10mm or greater thickness may be used on curved walls where the radius of the curve is 900mm or greater, as detailed in Table 24.

All Gyprock plasterboard types, except perforated, may be used on curved surfaces with a radius greater than 3000mm.

Fire rated walls MUST NOT be curved to a radius of less than 3000mm.

## Framing Preparation

Prepare the curved framing in accordance with Table 24 or Table 25 and Figure 33 appropriate for the chosen plasterboard and curving radius. For small radius curves, install double studs at each end of the curve to prevent frame deflection.

Rondo Flexi-Track makes the job of preparing curved walls considerably easier, and is available in 0.55 BMT for general use, and in 0.75 BMT for deflection head applications.

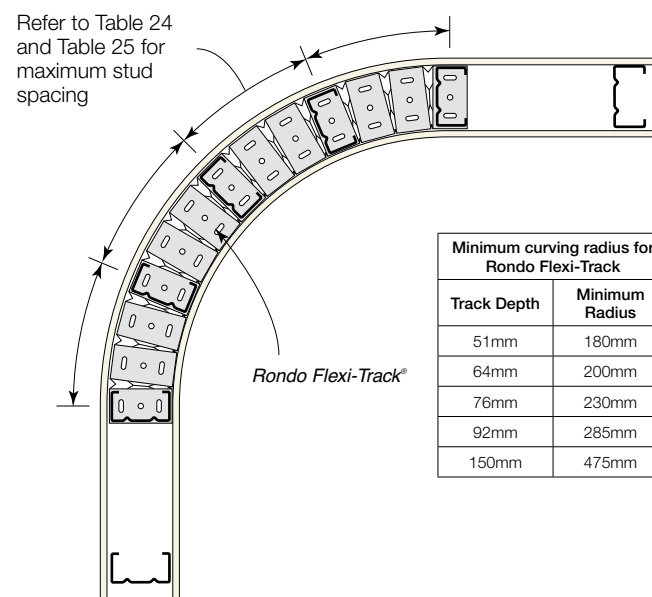
Flexi-Track should be fixed at each stud, through the pre-punched holes provided.

Ensure that all framing members to receive sheeting are correctly spaced and aligned for the application.

## Flexible Plasterboard Fixing

Gyprock Flexible Plasterboard sheets can be curved with the recess edges bent around the curve (horizontal sheeting), however for very small radius applications Gyprock Flexible

Figure 33: Framing Preparation For Curved Wall Using Rondo Flexi-Track



Plasterboard curves significantly better where the recess edges are not bent around the curve (vertical sheeting).

In most instances, two layers of Gyprock Flexible Plasterboard are recommended, and they can easily be flush jointed to one layer of 13mm Gyprock plasterboard for adjacent straight sections where appropriate.

All butt joints must fall on framing members.

When planning the sheet layout within the curved area, ensure that the sheet edges of the first and second layers are staggered at least 200mm to avoid aligned joints.

Fasten Gyprock Flexible Plasterboard as per Figure 34, Figure 35, Figure 36 or Figure 37 appropriate to the installation. Carefully follow the screw spacing details for each application.

Table 24: Curving Radii And Maximum Stud Spacing For 6.5, 10, 13 And 16mm Gyprock Plasterboard

Plasterboard Thickness (mm)	Gyprock Flexible Plasterboard	Gyprock Plus, Standard and Flexible Plasterboard ONLY				All Gyprock Plasterboard (excluding perforated and Soundchek products)	
	Curve Radius (mm)						
	<900	900 – 2000	2001 – 2500	2501 – 3000	3001 – 4000	>4000	
	Maximum Stud Spacing (mm)						
6.5	Refer to Table 25	150	300	350	450	550	
10	–	150	300	350	400	500	
13	–	–	250	300	400	500	
16	–	–	–	–	250	350	

Table 25: Minimum Curving Radii And Maximum Frame Spacing For Gyprock Flexible Plasterboard

Applications	Sheets Installed Vertically		Sheets Installed Horizontally	
	Minimum Radius	Max. Stud Spacing	Minimum Radius	Max stud Spacing
Concave	450mm	150mm	650mm	200mm
Convex	250mm	125mm	450mm	200mm

Notes – Low temperature and humidity will reduce board flexibility.

## Wetting Flexible Plasterboard

Wetting plasterboard is usually not a recommended practice, however when conditions of low humidity and temperatures occur, or an extremely tight radius is to be attempted, it may be necessary to roll on a small amount of water with a clean paint roller.

Only wet the face of the plasterboard that will be in compression.

Allow 15 minutes for water to soak into the core before attempting to bend the board.

## Fixing 10, 13 & 16mm Plasterboard

Gyprock 10, 13 and 16mm plasterboard may be attached vertically or horizontally, depending upon the framing support and application, however, wherever possible sheets should be installed with horizontal recess joints as this considerably improves the ease of jointing.

Sheets should begin and end a minimum of one stud from the curved section, and more if possible.

10, 13 and 16mm thickness plasterboard must be screw fixed to all studs at 100mm maximum from the top and bottom of the wall (but not through top tracks) and at 400mm maximum

centres for non-fire rated walls or 300mm maximum centres for fire rated walls.

All vertical butt joints must fall on framing members, be screw fixed at 200mm maximum centres, and be staggered by a minimum of 600mm between adjacent sheets.

## Jointing & Finishing

Jointing and finishing of curved walls is in accordance with normal practice.

In multi-layer systems, jointing and finishing is required on the outer layer only, on each side of the wall.

Note: Under some lighting conditions, glancing light may highlight the plasterboard joints. This is more apparent with vertical sheeting. A skim coat to the entire plasterboard surface is recommended to reduce this effect.

Gyprock Flexible Plasterboard can be painted with the full range of finishes.

The use of a preparatory sealer over the entire surface is recommended prior to application of finish coats.

Refer to the "Jointing & Finishing" section of this guide for details.

## Flexible Plasterboard Fixing For Concave Curves

Arrange sheets so that both layers of the flexible plasterboard extend at least one stud spacing beyond the curved area.

Attach one end/edge of the sheet to the framing member or substrate by fastening at the appropriate centres.

Apply pressure to the sheet and unrestrained end/edge of the sheet. When the sheet makes contact with the substrate it should be fixed with the appropriate fasteners, beginning at the fixed end/edge and proceeding towards the unrestrained end/edge.

The second layer joints should be staggered at least 200mm from the first layer to prevent aligned joints.

For radii less than 900mm, fix all layers at edges only as detailed. For radii greater than 900mm, also fix all layers in the field at 400mm max. centres to all framing. Avoid placing more screws than recommended into the plasterboard face within the curved area.

Figure 34: Concave – Vertical Sheeting

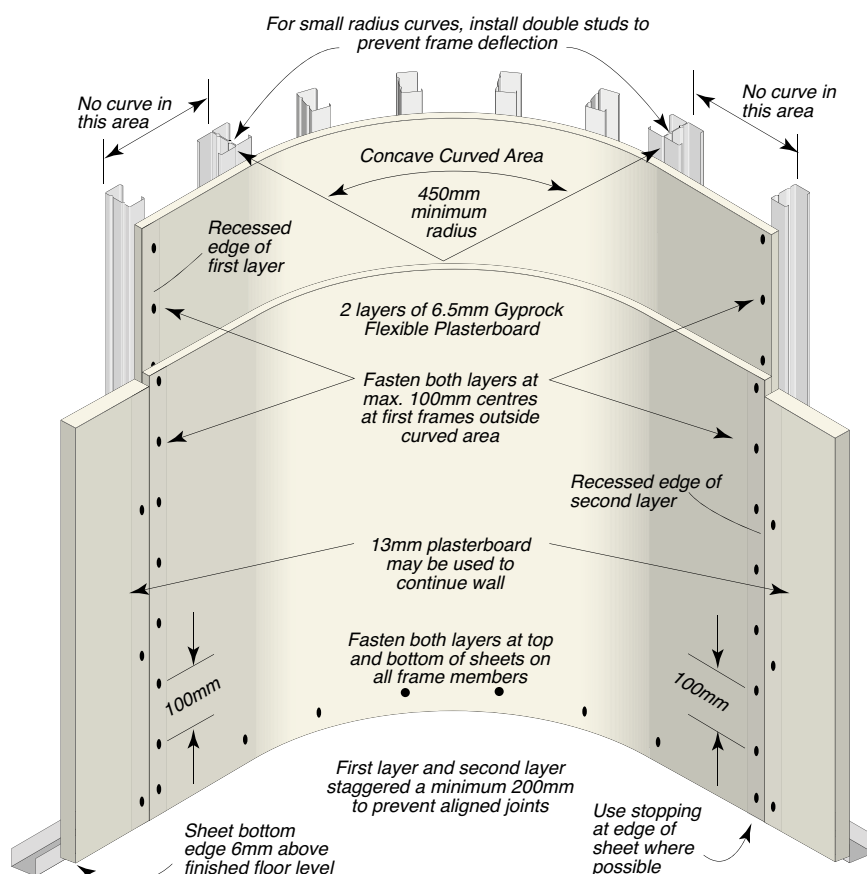
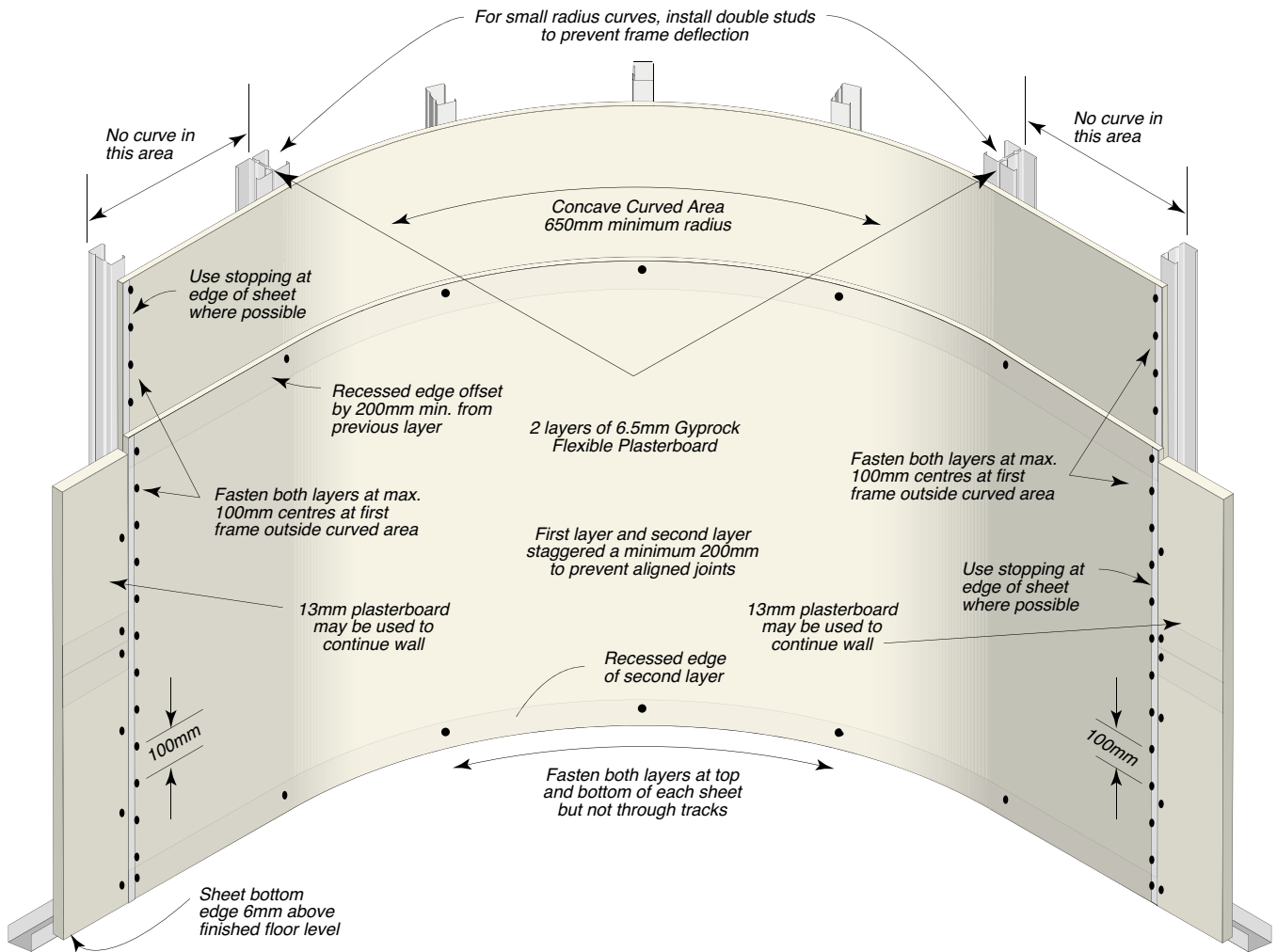




Figure 35: Concave – Horizontal Sheeting



## Flexible Plasterboard Fixing for Convex Curves

Arrange sheets so that both layers of the flexible plasterboard extend at least one stud spacing beyond the curved area.

Attach one end/edge of the sheet to the framing member or substrate by fastening at the appropriate centres.

Beginning from the fixed end/edge, progressively work the sheet against the framing.

As the sheet makes contact with the framing, fix the sheet with the appropriate fasteners.

The second layer joints in the curved area should be staggered at least 200mm from the first layer to prevent aligned joints.

For radii less than 900mm, fix all layers at edges only as detailed. For radii greater than 900mm, also fix all layers in the field at 400mm max. centres to all framing. Avoid placing more screws than recommended into the plasterboard face within the curved area.

Figure 36: Convex – Vertical Sheeting

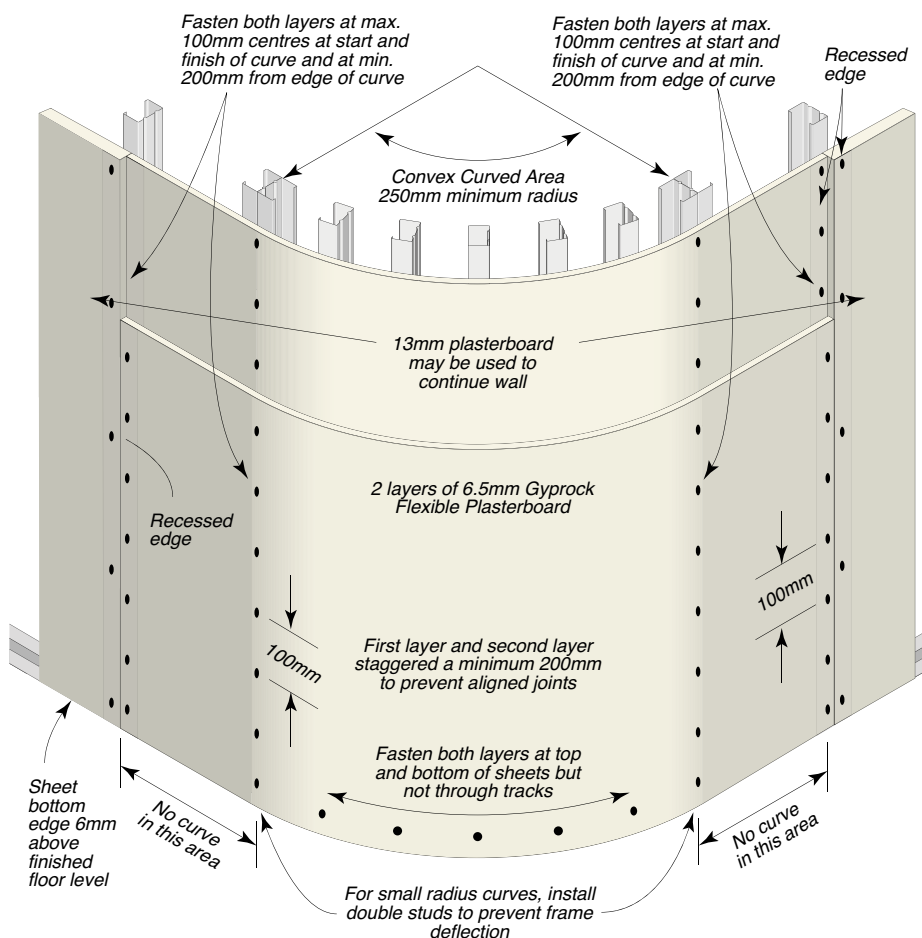
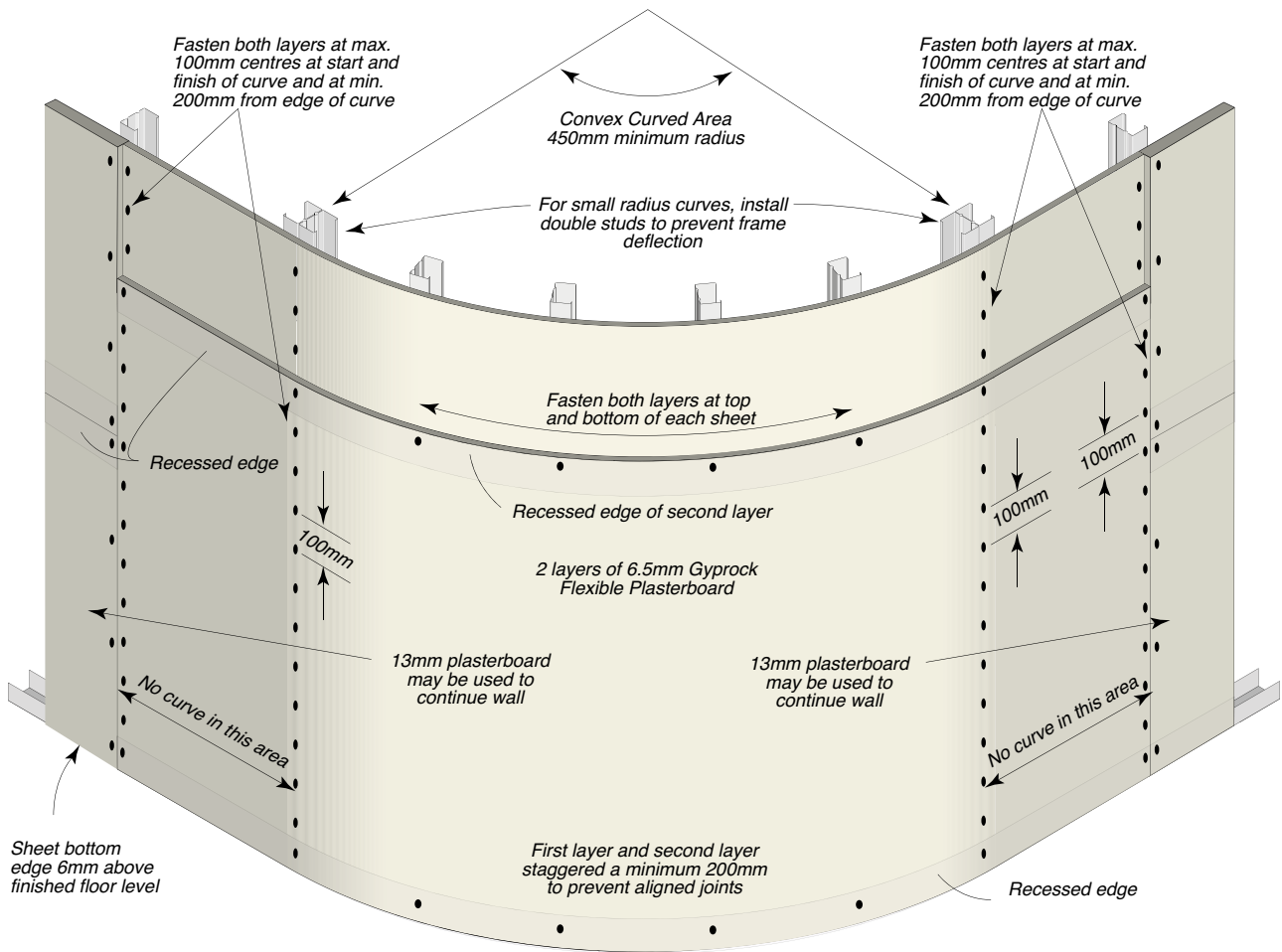


Figure 37: Convex – Horizontal Sheeting



# Junctions & Penetrations – Non-Fire Rated

Note: Wall/ceiling junction details require engineer's approval where seismic loads apply. Additional bracing may be required. Typical fixings shown. For 150mm tracks, use two fixings to supporting structure, located approximately 20mm from flanges.

## Wall Head Details

Figure 38: Friction Fit Head

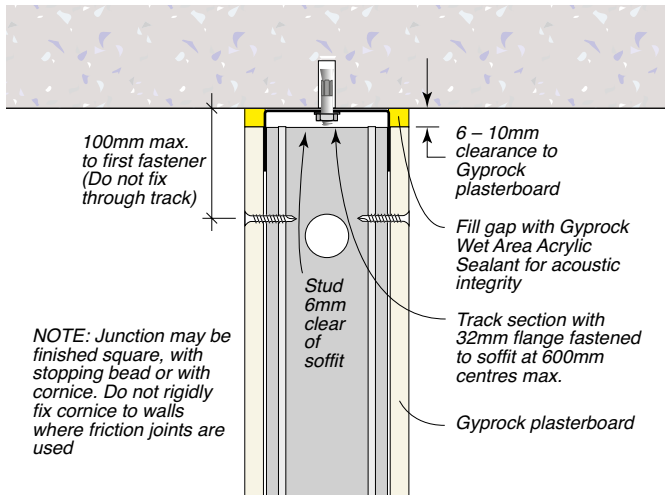


Figure 39: Deflection Head

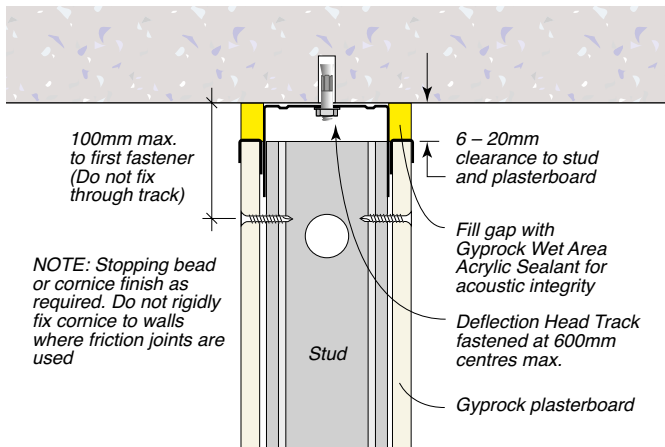


Figure 40: Deflection Head With Cornice

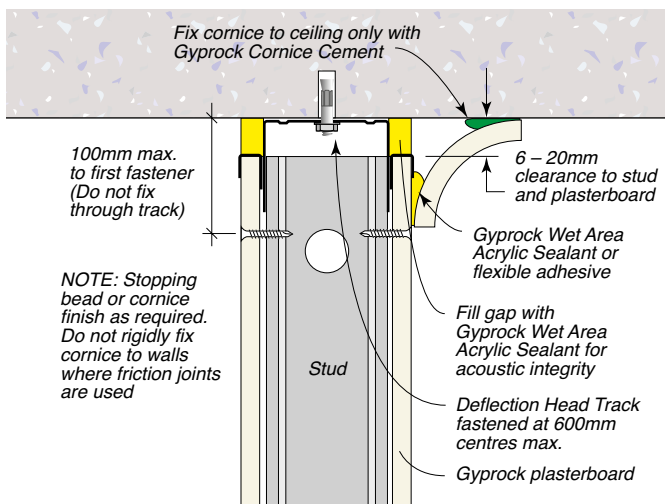


Figure 41: Head For Suspended Tee-Lock Ceiling

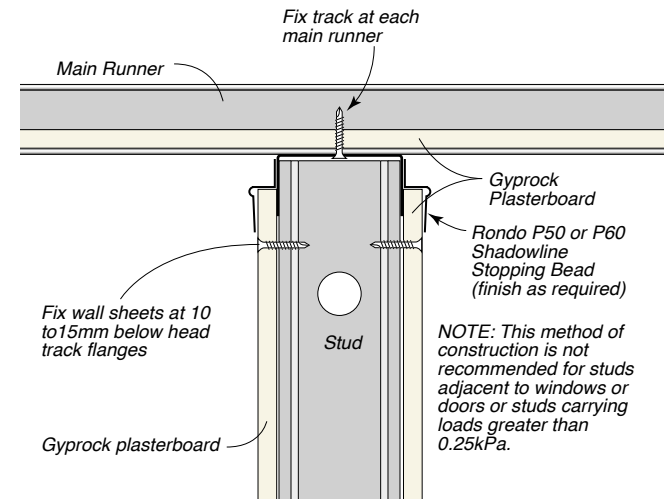


Figure 42: Head For Suspended Ceiling

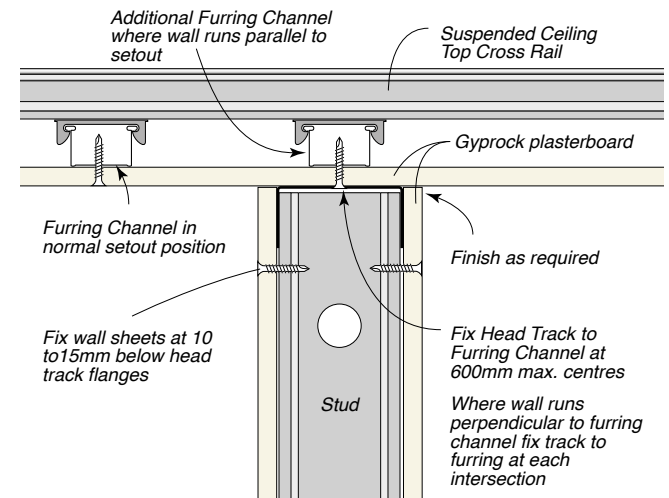


Figure 43: Head Using Aluminium Head Track

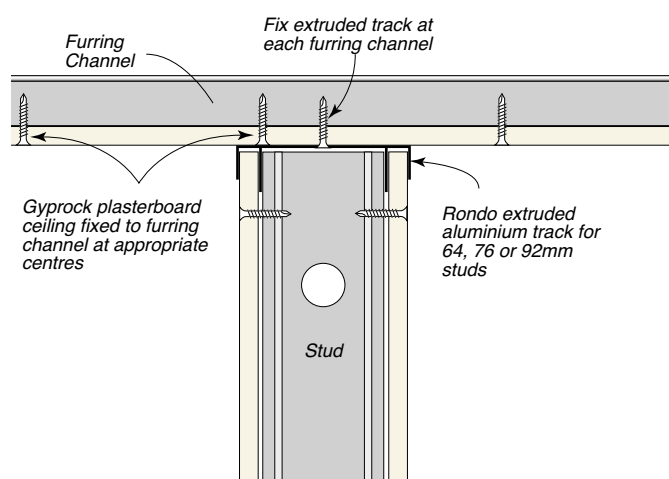


Figure 44: Wall/Ceiling Junction – Plasterboard Lining

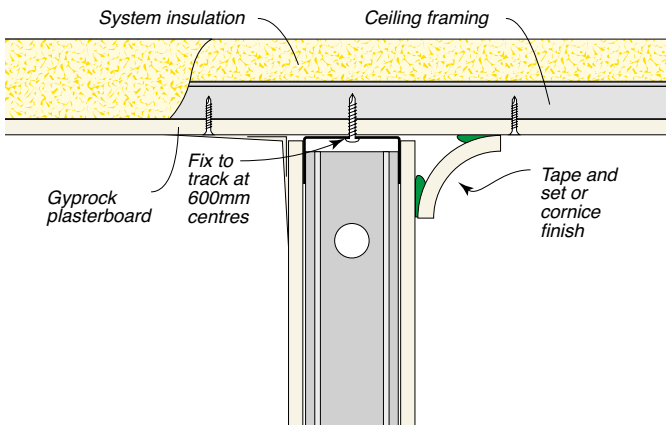


Figure 47: Wall/Ceiling Junction – Tile Lining

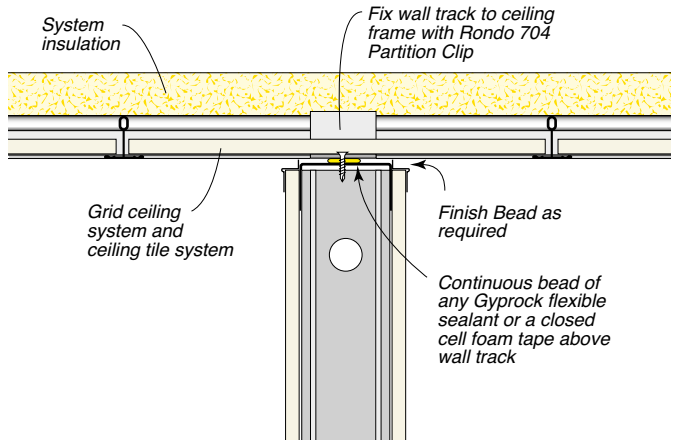


Figure 45: Wall/Ceiling Junction – Plasterboard Lining

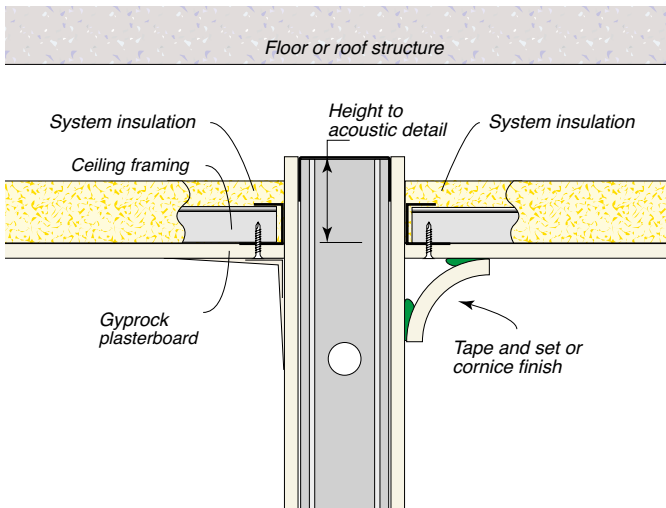


Figure 48: Wall/Ceiling Junction – Tile Lining

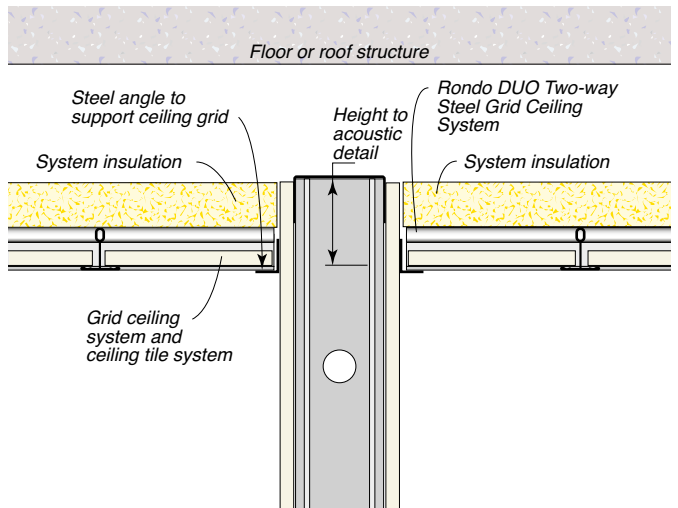


Figure 46: Wall/Ceiling Junction – Plasterboard Lining

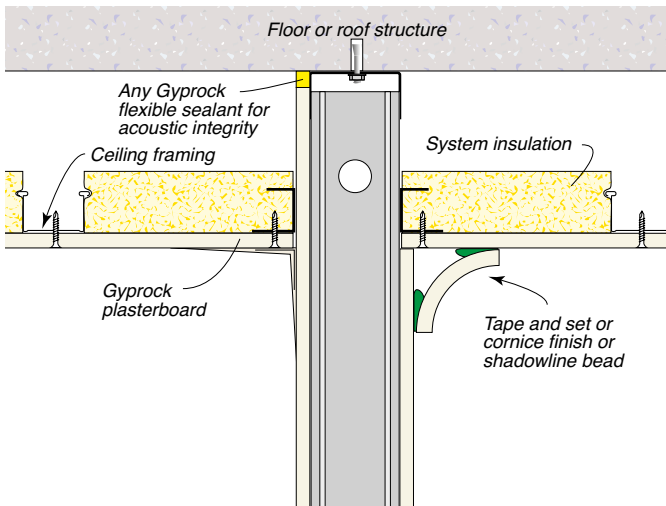


Figure 49: Wall/Ceiling Junction – Tile Lining

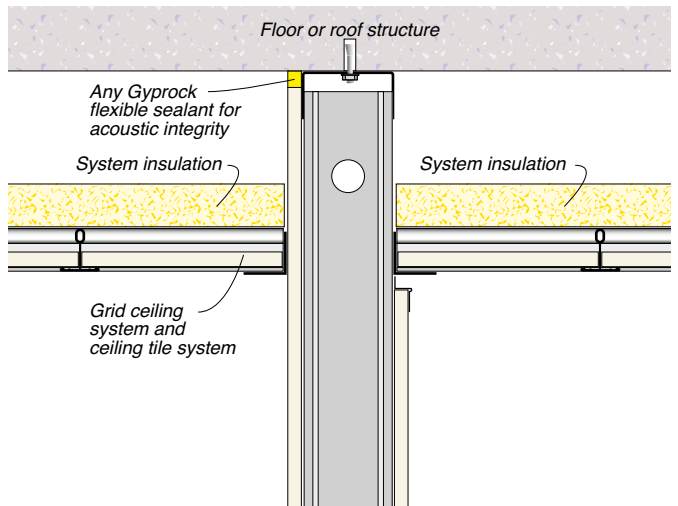


Figure 50: Wall/Ceiling Junction – Plasterboard Lining

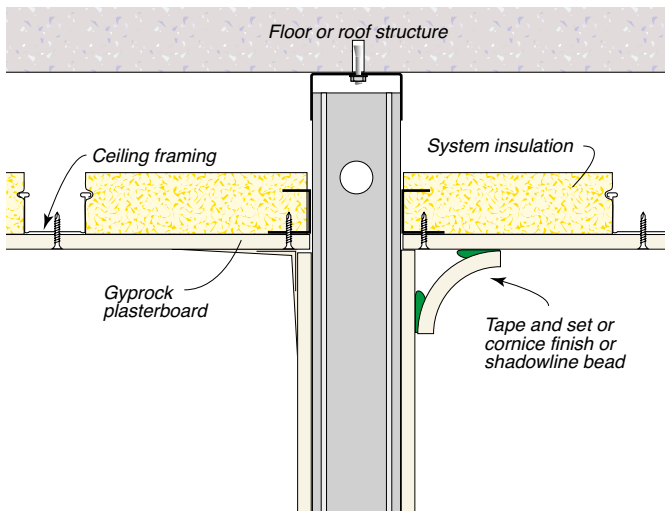
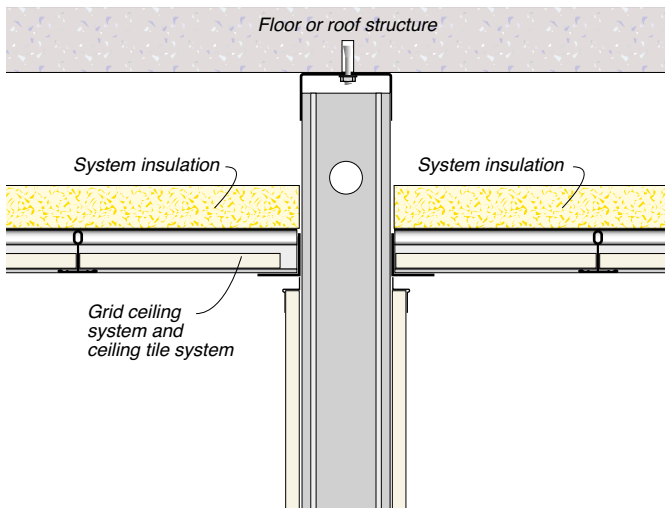


Figure 51: Wall/Ceiling Junction – Tile Lining



Wall Base Details

Figure 52: Wall Base Detail

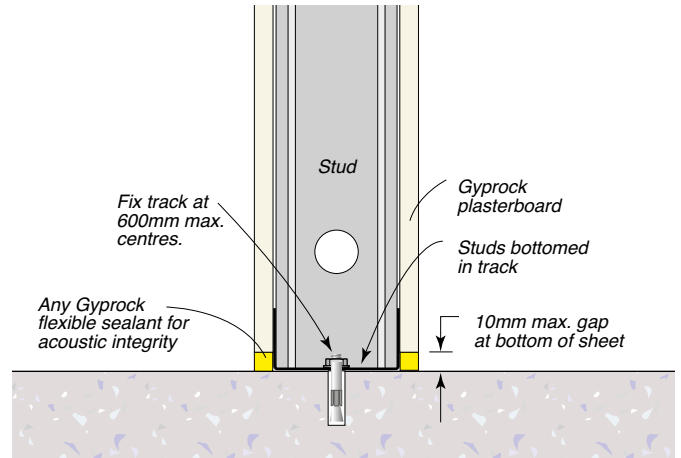
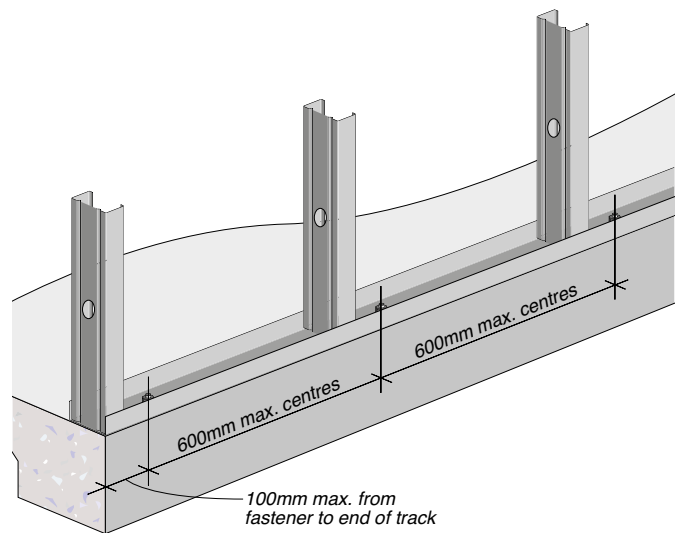


Figure 53: Track Fixing Detail – Head Detail Similar



Control Joints

Figure 54: Vertical Control Joint – Non-Tiled Wall

(Only suitable for walls with no acoustic performance requirements).

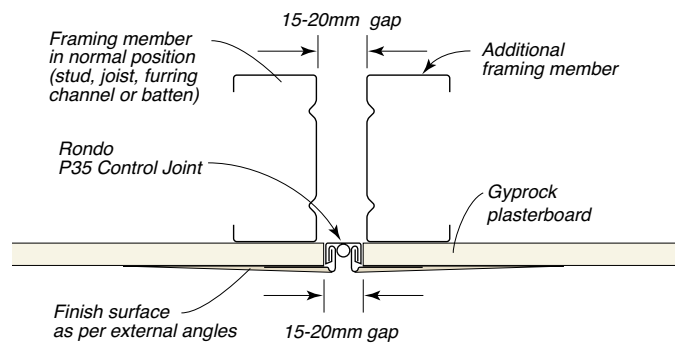


Figure 55: Vertical Control Joint – Tiled Wall

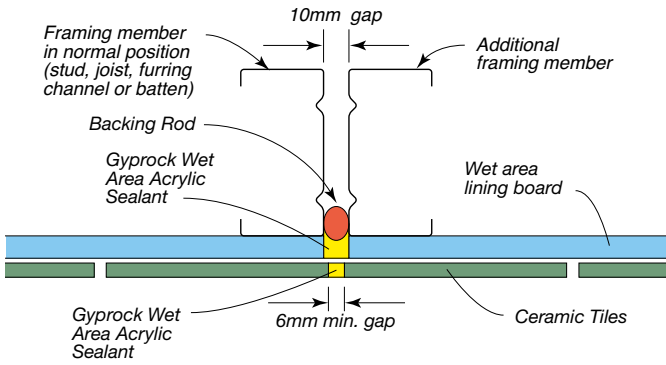


Figure 56: Vertical Control Joint – Steel Stud Wall System

(Maintains acoustic integrity of the wall system in which it is installed).  
 For  $R_w$  up to 40, use backing rod only detail.  
 For  $R_w$  greater than 40, use backing rod and sealant detail.

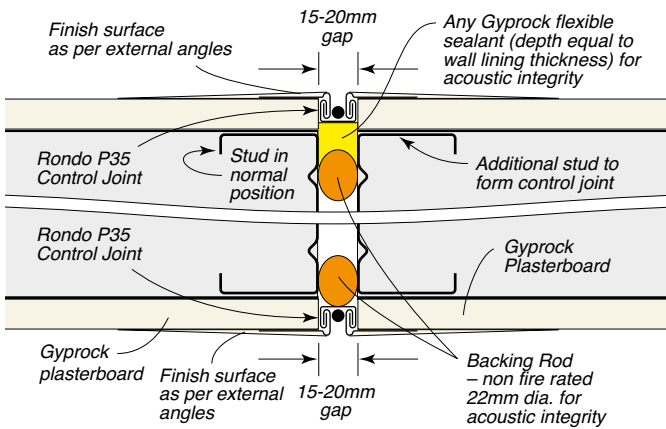


Figure 57: Vertical Control Joint – Steel Furring On Masonry Wall

(Maintains acoustic integrity of the wall system in which it is installed).

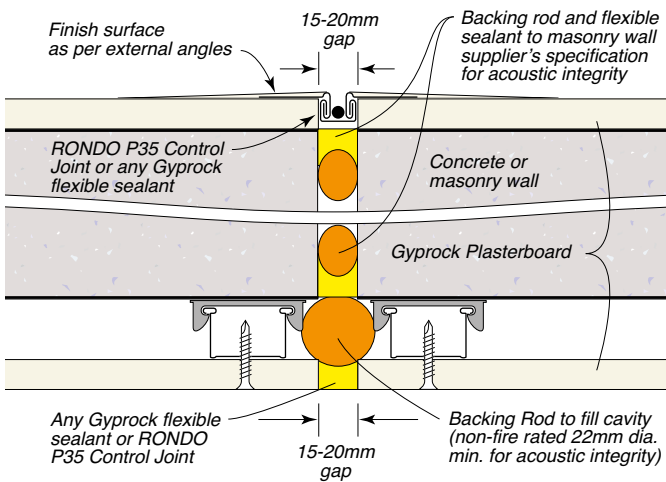


Figure 58: Vertical Control Joint – Steel Furring On Masonry Wall

(Only suitable for walls with no acoustic performance requirements).

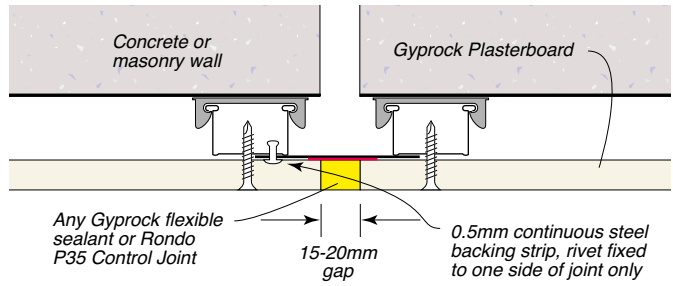


Figure 59: Horizontal Control Joint – With Cover Mould

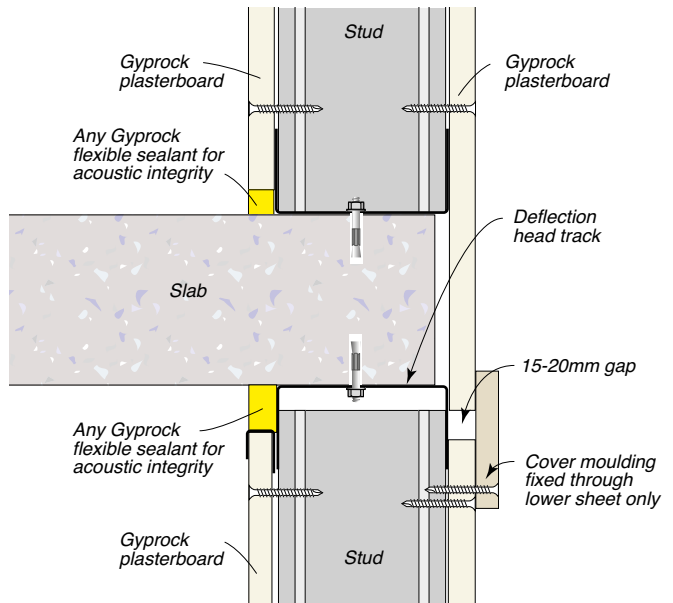
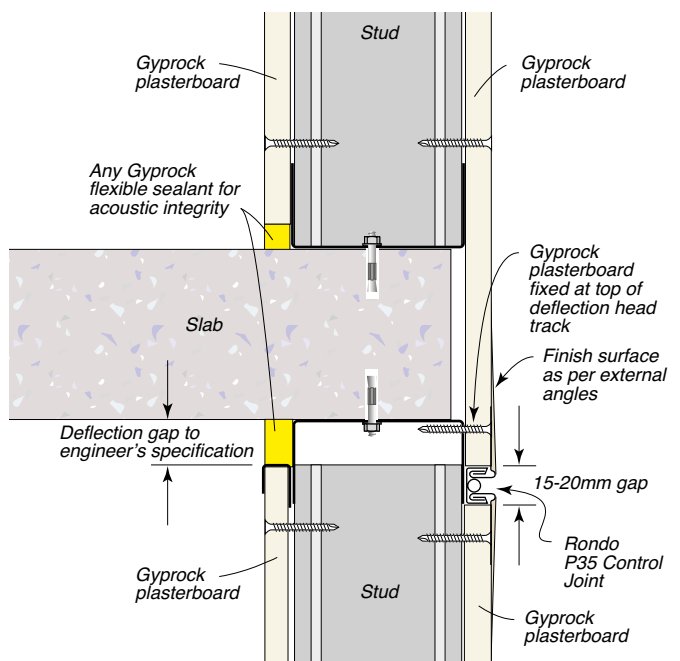


Figure 60: Horizontal Control Joint – With P35 Control Joint





Wall Junctions

Figure 61: Junction Detail – Plasterboard To Plasterboard Walls

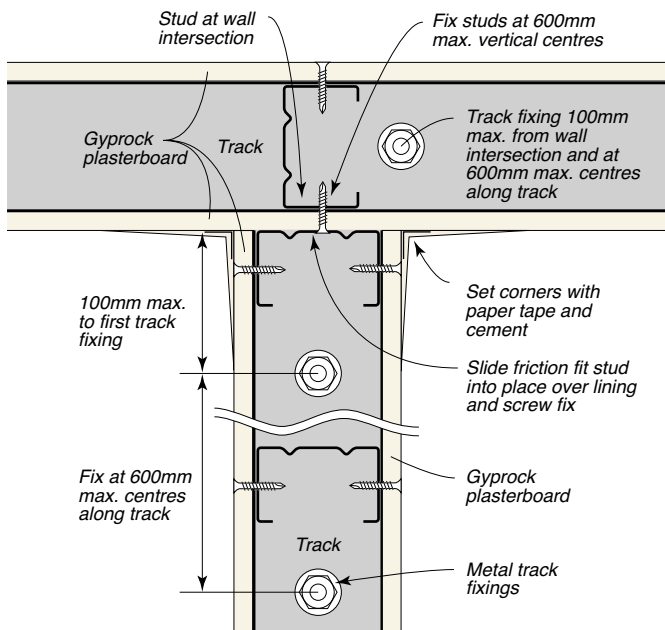


Figure 62: Junction Detail – Alternative Plasterboard To Plasterboard Walls

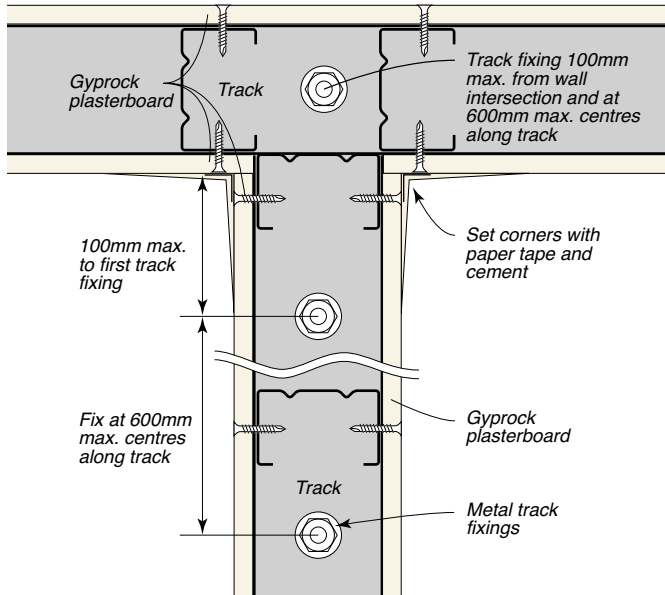


Figure 63: Corner Detail – Plasterboard To Plasterboard Walls

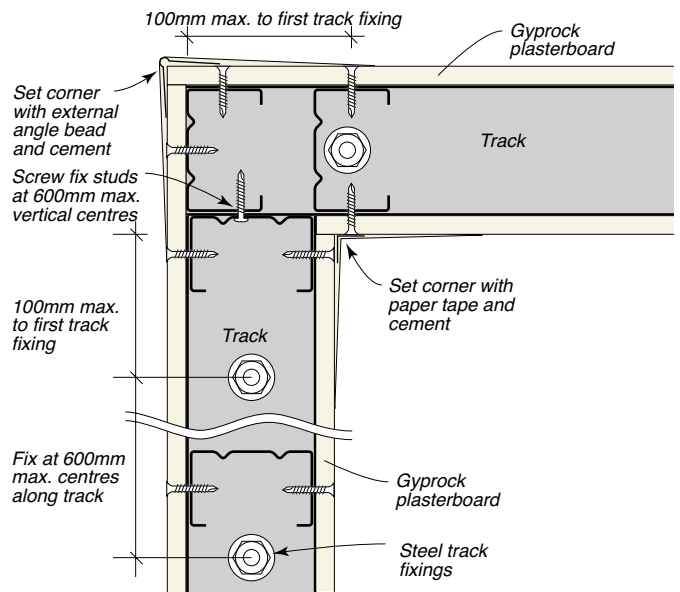


Figure 64: Corner Detail – Alternative Method Plasterboard To Plasterboard Walls

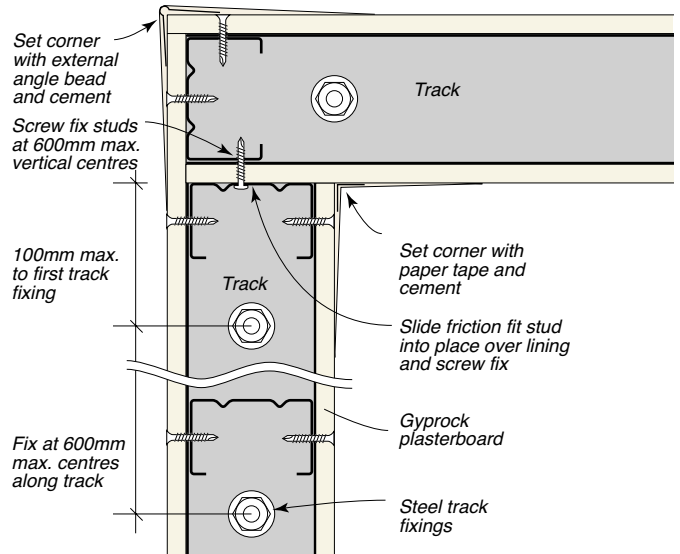
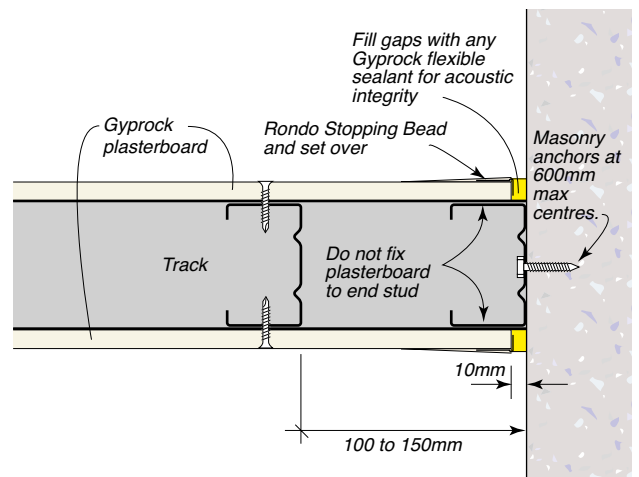


Figure 65: Junction Of Masonry And Steel Stud Plasterboard Wall



### Door Jamb/Head Details

Prepare the framing in accordance with "Framing Requirements", and linings in accordance with "Sheet Installation" as previously detailed in this guide.

Figure 66: Timber Door Frame Detail

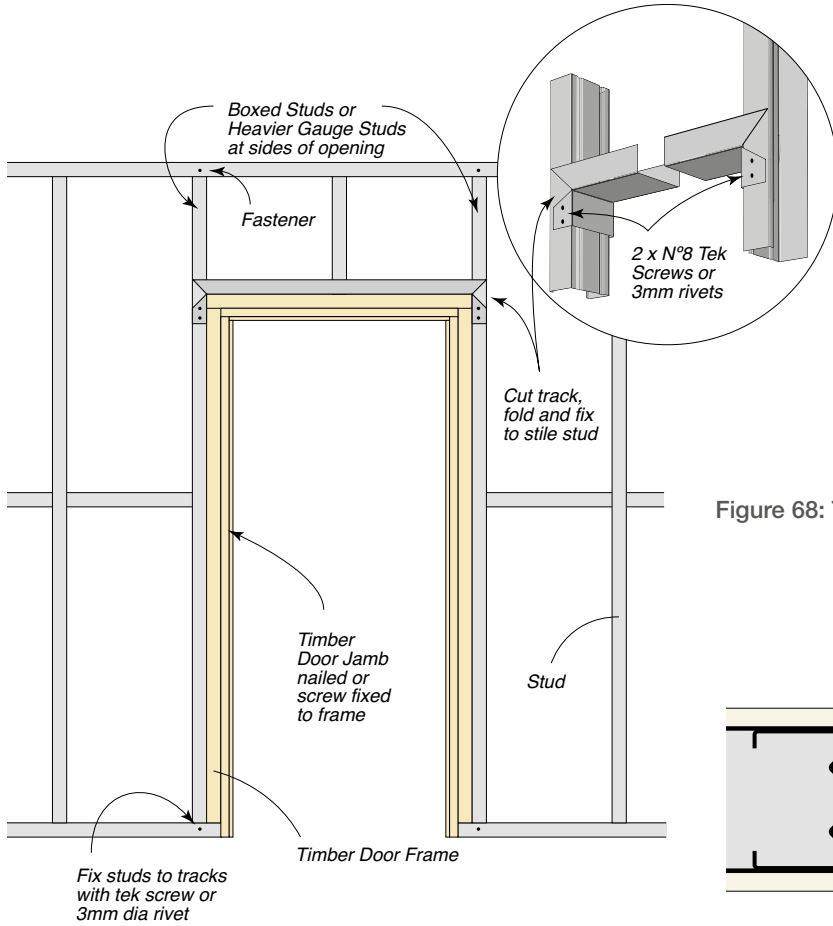


Figure 67: Timber Door Frame Head Section

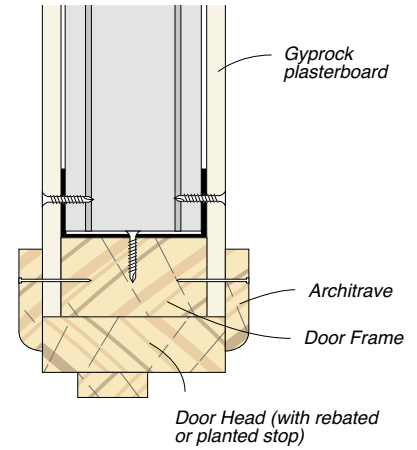
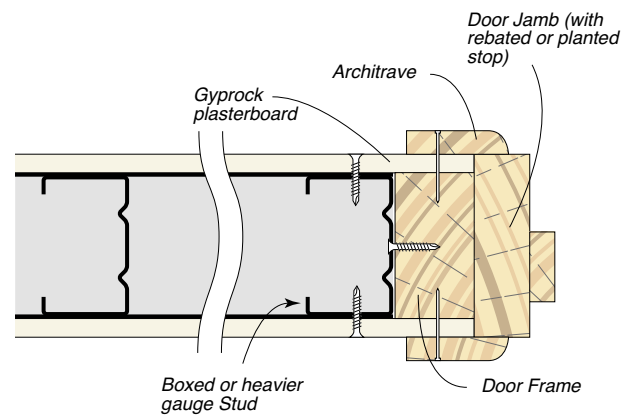


Figure 68: Timber Door Frame Jamb Section



### Alternative Door Jamb Details

NOTE: Either boxed studs or heavier gauge studs should be used to support door jambs.

Figure 69: Timber Jamb Lining Junctions

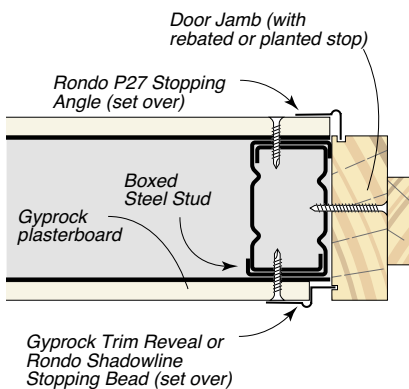


Figure 70: Typical Metal Door Jamb

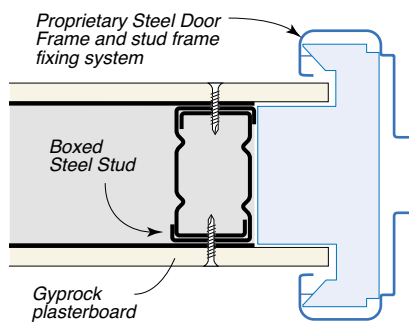
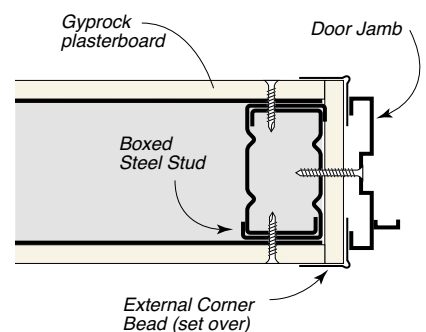


Figure 71: Typical Aluminium Extruded Door Jamb



Attachments

Figure 72: Lightweight Fixtures (Eg. Pictures And Wall Mirrors)

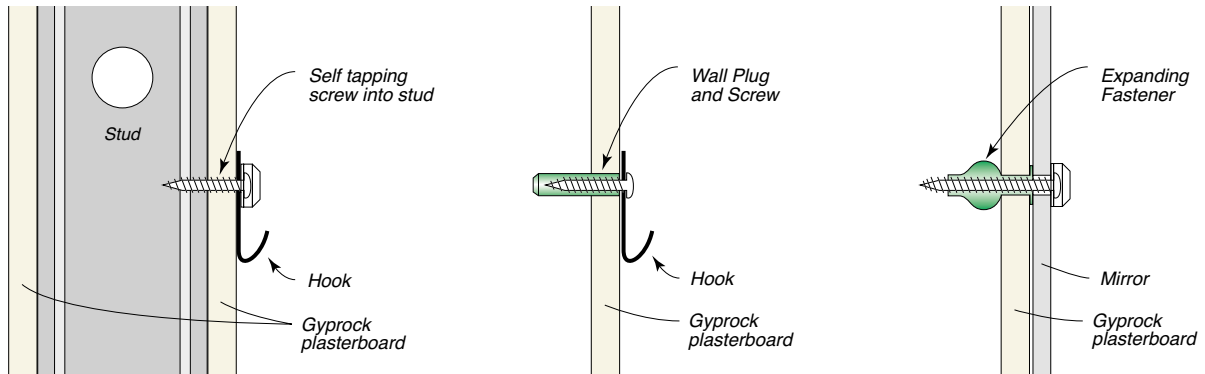


Figure 73: Medium Weight Fixtures (Eg. Cupboards And Shelves)

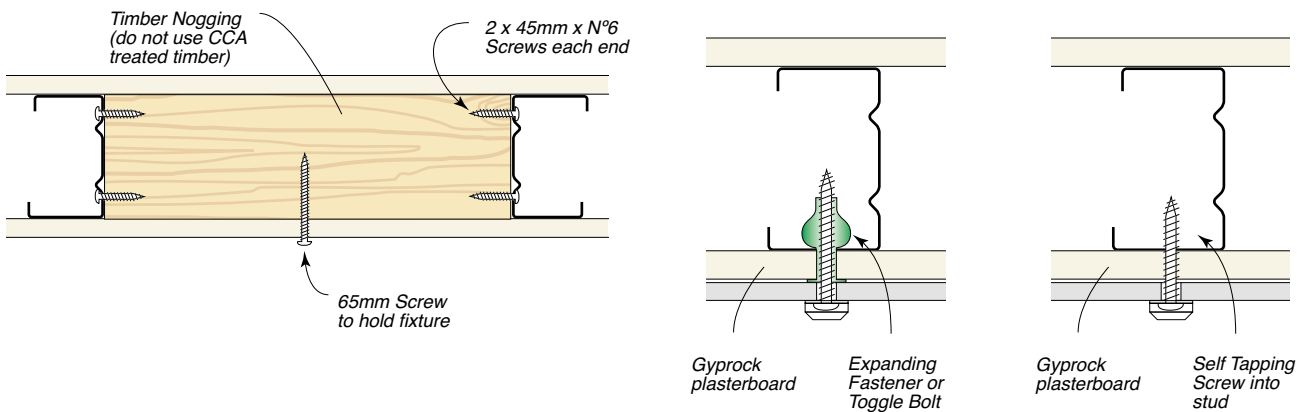
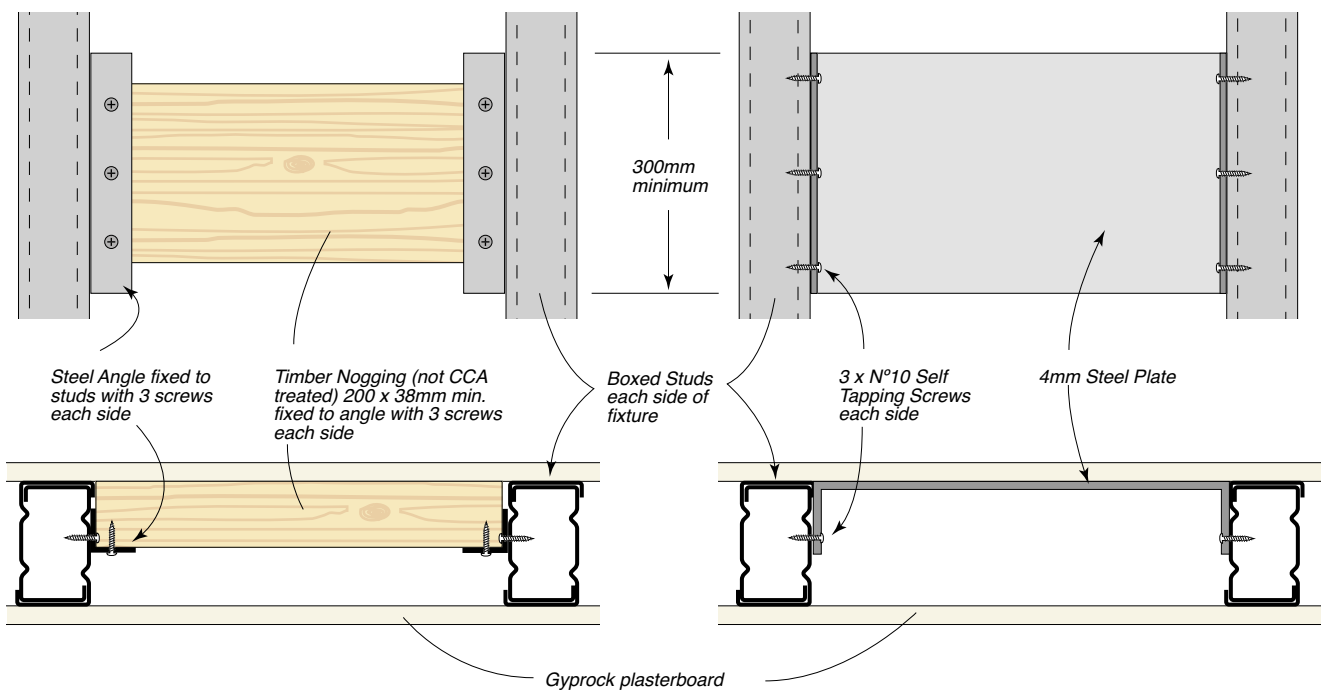


Figure 74: Heavyweight Fixtures (Eg. Wall Basins And Cisterns – Excluding Wall Hung WC Pans)



# Fire Rated Wall Systems

## Framing Requirements

The installation of steel stud and track wall framing for fire rated construction generally follows the same procedure as for non-fire rated walls.

Non-loadbearing wall framing is constructed using Rondo lipped steel studs fitted into track sections positioned at the top and bottom of the wall.

Deflection head track must be used on non-loadbearing walls exceeding 4800mm in height and may be specified in any wall system to allow for vertical movement of the roof/ceiling.

Studs are held in the tracks by friction fit, and they must not be fixed to head track by mechanical fasteners or crimping.

Staggered stud wall systems are constructed using the Gyprock Staggered Stud Clip to locate 64mm depth lipped studs in 92mm floor and ceiling tracks. Alternatively, Rondo P140 sections may be used to locate studs to head track/angles. Refer to detailed assembly information.

The Building Code of Australia requires that internal non-loadbearing, fire rated walls be designed for a minimum UDL of 0.25kPa or in some cases 0.35kPa. Refer to Table 18 to Table 22 for suitable stud size/height selection information. Where higher pressures are specified refer to Rondo for additional information.

### Control Joints

Control joints must be installed to allow for structural movement. Allowance for movement must be made through the frame, lining and any tiles.

Vertical control joints in stud walls are to be constructed using two studs with a 15-20mm gap between.

Door frames extending from floor to ceiling constitute control joints. For doors less than ceiling height, a control joint extending from one corner of the frame may be used.

Control joints must be installed at all construction joints in the building and at the following locations:

- Walls with plasterboard outer layer – at 12m maximum centres.
- Non-tiled internal walls with fibre cement outer layer – at 7.2m maximum centres.
- Tiled internal walls – at 4.8m maximum centres.
- At junctions with other building elements.
- At changes of lining material.
- At changes of structural support systems.
- At each storey or rise of studs.

Refer to Junctions & Penetrations for appropriate details.

### Track Fixings

Track fixings should be selected as appropriate for the substrate and conditions, including seismic considerations.

Each track fastener is required to withstand a shear load of 0.75kN for walls with a design load of 0.25kPa.

For walls with a design UDL of 0.35kPa, each track fastener is required to withstand a shear load of 1.1kN. For other loads, and for walls subject to seismic loads, refer to the framing designer.

### Nogging

Nogging is not required in non-loadbearing single stud wall systems less than 4.4m in height which have plasterboard fixed on both sides. Nogging must not be used in Rondo Quiet Stud or staggered stud walls.

Nogging is required in the following locations:

- Behind butt joints in the first plasterboard layer in vertical sheeting applications.
- Non-loadbearing double stud walls and single stud walls lined on one side only. An additional nogging is also required near the top of the wall. Refer to Table 21 and Wall Head Details.
- Noggings or similar framing must be installed where support is required for attaching handrails and wall fixtures.
- All loadbearing wall systems to stabilise the wall. Refer to the project engineer or Rondo for technical requirements.

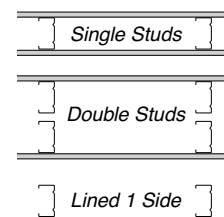
Where nogging is required, it should be screw fixed or crimped to both flanges of each stud unless noted.

Nogging must not be installed in staggered stud wall systems, as additional connection between studs reduces the acoustic performance of these wall systems.

## Framing Preparation

### Single Stud, Double Stud Framing & Studs Lined One Side

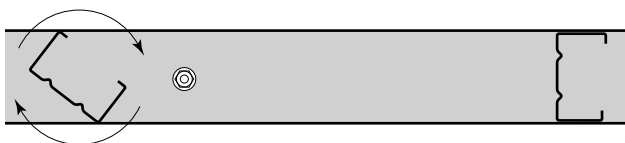
- Accurately align floor and ceiling tracks according to the wall layout and fasten in place at 100mm maximum from each end of the track and at 600mm maximum centres along the track.
- Wall plates must be fixed to the support structure with steel fasteners.
- Cut studs 15mm shorter than the floor to ceiling height to allow for heat expansion during a fire (20mm shorter where



deflection head track is used). Studs should be prepared so that service holes in the webs will be aligned after installation.

- Place studs into the tracks and twist into position. The track flanges should provide a friction fit. Ensure studs are bottomed in floor track. Do not fix studs to top tracks.

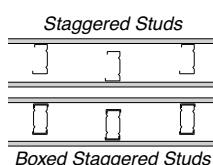
Figure 75: Stud Installation



- Position a stud at each end of the wall, and where appropriate, fix its web to the adjacent wall structure.
- Position studs along the wall at 600mm maximum centres. The open sides of these studs should be facing the end of the wall from which sheeting will begin.
- Where nogging track is to be used, fit to studs before installing into tracks. Otherwise cut-to-length nogging can be fitted after stud installation.

### Staggered Stud Framing

Staggered stud steel frame wall systems are suitable for fire rated applications, and are constructed using various steel sections as studs.



For detailed installation information, refer to 'Staggered Stud Framing' on page 35.

## Sheet Installation

### Introduction

#### All Fire Rated Wall Systems Must Be Fastener Fixed.

Installation details for Gyprock Fyrchek plasterboard are also suitable for other Gyprock fire grade plasterboard. Refer to the Gyprock Red Book for system performance details.

Provide adequate ventilation in all structures to minimise air humidity. Excessive humidity may result in the plasterboard bowing.

### Sheet Layout

Gyprock plasterboard sheets may be installed horizontally or vertically. Sheet orientation should be chosen so that any critical light falls along the recessed joints, or to minimise the number of butt joints. To achieve some Levels of Finish horizontal sheeting should be used, except that a single sheet may be fixed vertically where it covers the whole wall.

### Control Joints

Control joints must be installed to allow for structural movement. Allowance for movement must be made through the frame, lining and any tiles.

Vertical control joints in walls are to be constructed using two studs with a 15-20mm gap between.

Refer to Control Joints in the preceding Framing section for appropriate locations.

Refer to Junctions & Penetrations for appropriate details.

### Service Penetrations

Where possible, plasterboard linings should be installed prior to the installation of services. This allows pipes and cables to be fitted through neatly cut openings that can be easily treated for effective fire and acoustic performance. Agreement on the location of all services should be reached between the relevant designers and installation contractors prior to construction. Alternatively, if services are installed before plasterboard linings, details are provided that include additional linings required to enable penetration treatment.

Where electrical wiring is obviously mounted for connection to a wall or ceiling fixture, the installer shall pass the cables through a neat, close-fitting hole in the face of the sheet at the appropriate position clearly marked by the electrician.

Refer to the Junctions & Penetration details for sealing treatment.

### Caulking

To achieve the specified fire and/or sound performance, all perimeters and junctions must be sealed with Gyprock Fire Mastic or CSR FireSeal. Other tested fire/acoustic rated material of equivalent or better performance may also be used when installed in accordance with the manufacturer's details.

### Tiled Walls

Where Gyprock plasterboard is used as a substrate for tiles, the sheets must be fastened with screws only. Adhesive/fastener fixing is not acceptable.

Refer to fixing details later in this guide for specific fastener positioning based on tile weight.

### Jointing & Finishing

Sheets are to be fitted together neatly at joints. Gaps up to 3mm wide must be filled with a Gyprock Base Coat before jointing. Wider gaps are not permitted. Refer to the Jointing & Finishing section of this guide for detailed information.

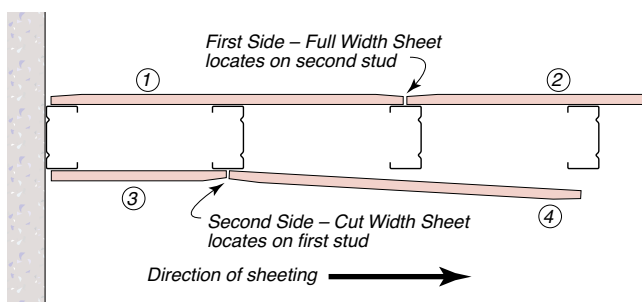
In multi-layer systems, jointing and finishing is required on the outer layer only, on each side of the wall.

As a minimum, Gyprock paper tape and a single coat finish may be used in non-visible areas.

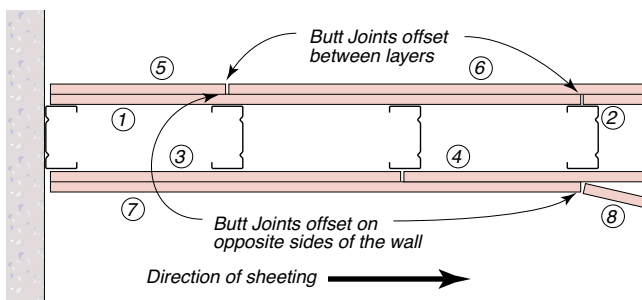
**Sheet Fixing Procedures**

- Sheets must be fastener fixed, adhesive may be used, but must not be used to replace fasteners.
- Where possible, sheeting should commence from the end facing the open side of the studs. Refer to the following illustrations for sheeting direction and order.

**Figure 76: Sheeting Direction And Recess Joint Location For Vertical Sheeting**

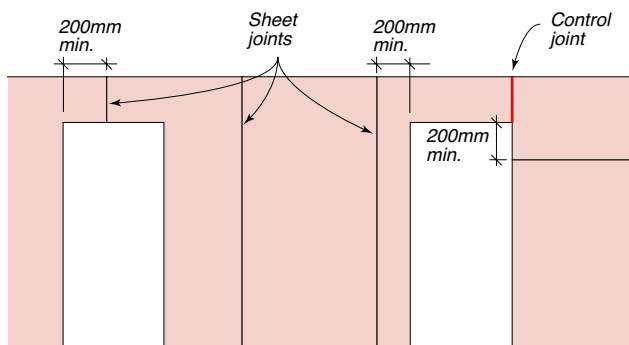


**Figure 77: Sheeting Direction And Butt Joint Location For Horizontal Sheeting**



- Joints are not to coincide with the edge of openings (eg doorways or windows). Sheets are to be laid so that any joint falls a minimum of 200mm from the edge of an opening. Avoid butt joints over single doorways and cavity sliding doors wherever possible. Refer to the following detail.

**Figure 78: Joint Layout For Vertical Or Horizontal Sheeting**



- Do not fasten plasterboard sheeting to the head tracks in stud wall systems.

- Do not fix plasterboard to steel framing which is greater than 2.4mm in thickness.
- Where possible it is recommended that full length sheets are used to minimise butt joints at sheet ends. Sheets should be butted neatly together, but not forced.
- For single layer systems and the first layer of multi-layer systems, all butt joints must be backed by either a stud or nogging and fixed as per the appropriate system fixing table. Steel framing members must have a fixing face equal to or greater than 32mm width.
- For two layer systems, butt joints in the outer layer should be either backed by nogging or stud and fixed as per the appropriate system fixing table, or located between framing and fixed using laminating screws as per the appropriate system fixing table.
- For three layer systems, butt joints in the outer layer should be located between framing and fixed using laminating screws as per the appropriate system fixing table.
- Butt joints in adjacent sheets on the same side of a wall are to be staggered and located on/between different framing members.
- Ensure that all services and insulation materials are installed (when required), prior to the fixing of sheets to the second side of stud walls.
- Sheets are to be fitted together neatly at joints. Gaps up to 3mm wide must be filled with a Gyprock Base Coat before jointing.
- Where indicated in the Levels of Finish table, external corners subject to damage are to be protected with a suitable Gyprock metal corner bead attached and finished as per details in the Jointing section of this guide.
- In fire or acoustic rated systems, all outer layer joints and corners, including those in non-visible areas such as ceiling voids, must be finished with a minimum of base coat and paper tape.
- In wet areas, approved moisture resistant and fire grade Gyprock plasterboard (or moisture resistant and fire grade Gyprock plasterboard plus CeminSeal Wallboard) must be used. Refer to the Gyprock Plasterboard Applications and Selection Table in the Components section of this guide.
- Do not overdrive fasteners. Refer to the following details.

**Fixing Plasterboard**

Position fasteners between 10mm and 16mm from sheet edges.

All fasteners are to be driven home with the head slightly below the surface of the sheet, but not punched through the face linerboard. Best results are obtained using a screw gun. Care should be taken to avoid damaging the face or core of the plasterboard.

**Figure 79: Fastener Driving – Plasterboard**

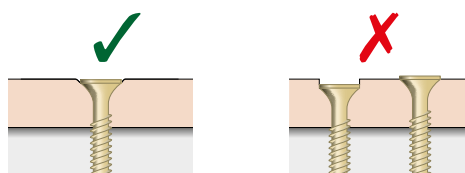
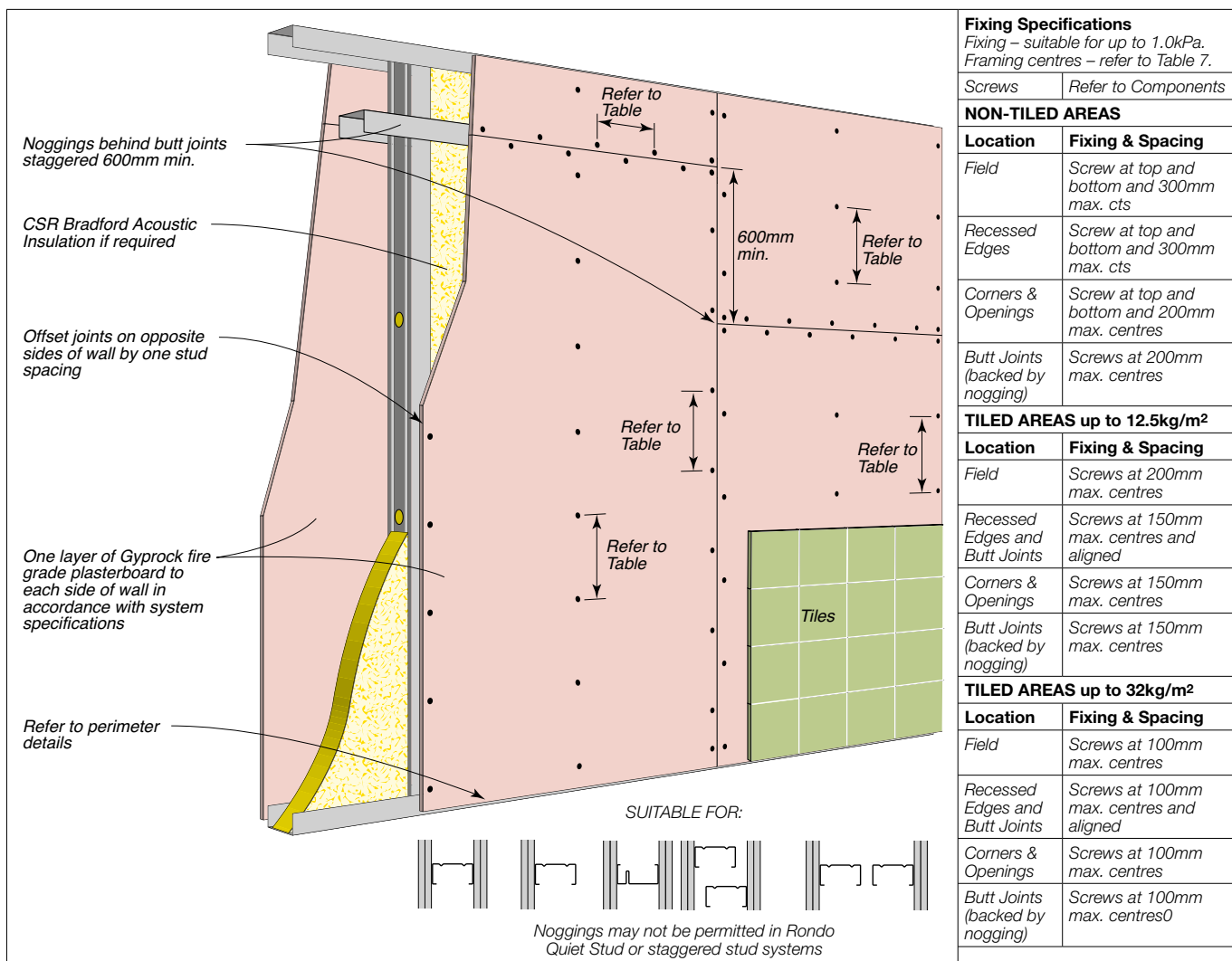




Figure 80: Fire Grade Plasterboard Fixing – Single Layer – Vertical Sheeting – Non-Tiled Or Tiled Areas



**Notes On Fixing**

- Offset joints on opposite sides of the wall by one stud spacing.
- Cut sheets as necessary to provide up to 10mm gap at the bottom and appropriate clearance at the top.
- If butt joints are required, they must be staggered by 600mm minimum in adjacent sheets, backed by noggings and fixed as per the Fixing Specification Table.
- Place edge fasteners at 100mm maximum from top and bottom edges, but not through top tracks, and elsewhere 10 to 16mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side**

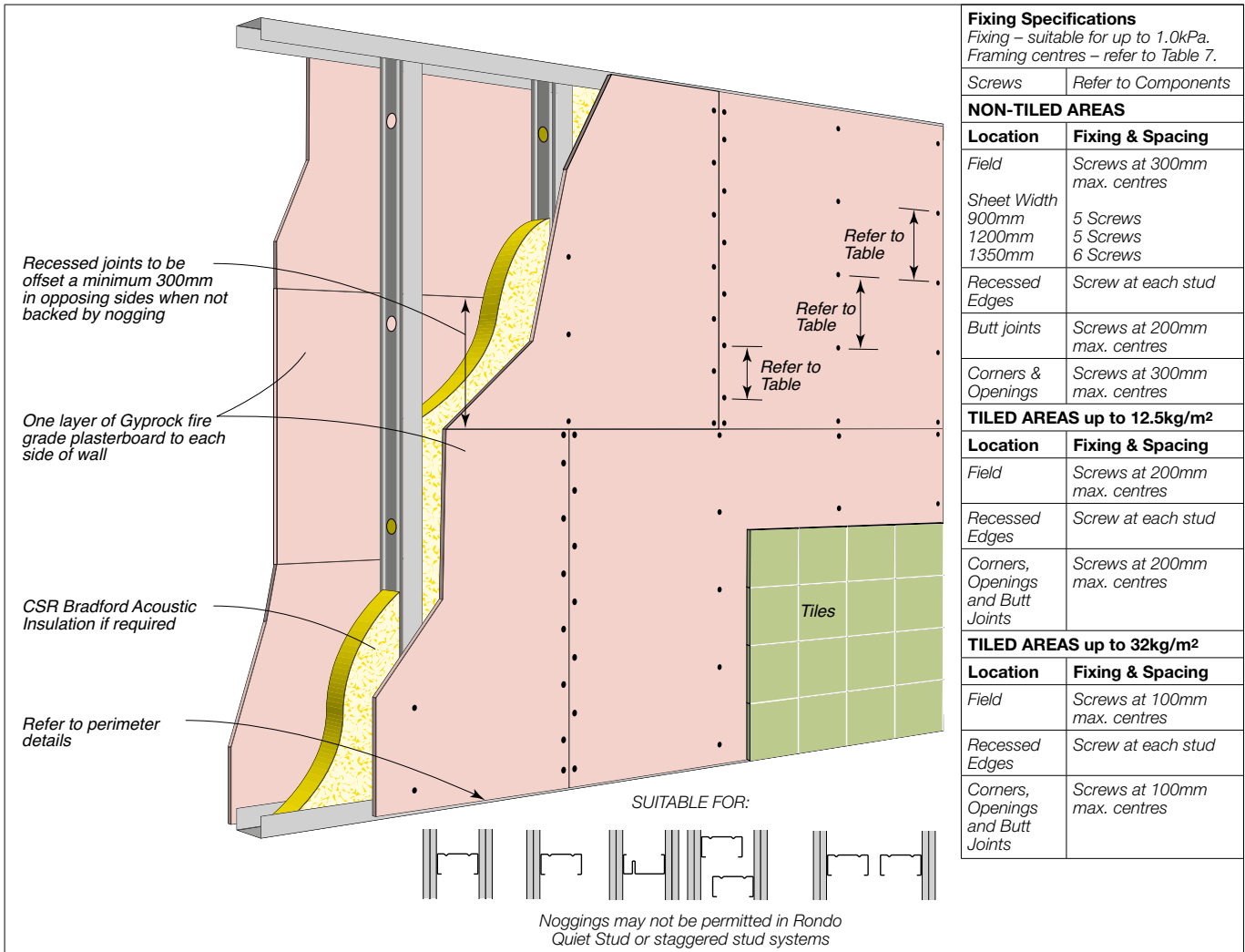
- Apply sheets vertically (paper bound edges parallel with studs), leaving a 10mm max. gap between the bottom of the sheet and the floor, and with recess joints centred on stud flanges.
- Press the sheet firmly against the studs and screw fix recessed joints as per the Fixing Specification Table. Do not fix to intermediate studs at this time.
- Screw fix at all butt joints, corners and around openings as per the Fixing Specification Table.

**Second Side**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Cut the first sheet to half width so that joints on opposite sides of the wall are located on different studs.
- Screw fix to all studs as per the Fixing Specification Table.

Return to the first side and screw fix plasterboard to intermediate studs as per the Fixing Specification Table.

Figure 81: Fire Grade Plasterboard Fixing – Single Layer – Horizontal Sheeting – Non-Tiled Or Tiled Areas



**Notes On Fixing**

- Butt joints in adjacent sheets and on opposite sides of the wall must be staggered by a minimum of one stud spacing.
- All butt joints must be centred on a stud.
- Cut sheets as necessary to provide up to 10mm gap at the bottom and appropriate clearance at the top.
- Place edge fasteners at 100mm maximum from top and bottom edges, but not through top tracks, and elsewhere 10 to 25mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side**

- Apply sheets horizontally (paper bound edges at right angles to studs), leaving a 10mm max. gap between the bottom of the sheet and the floor, and with butt joints centred on stud flanges.

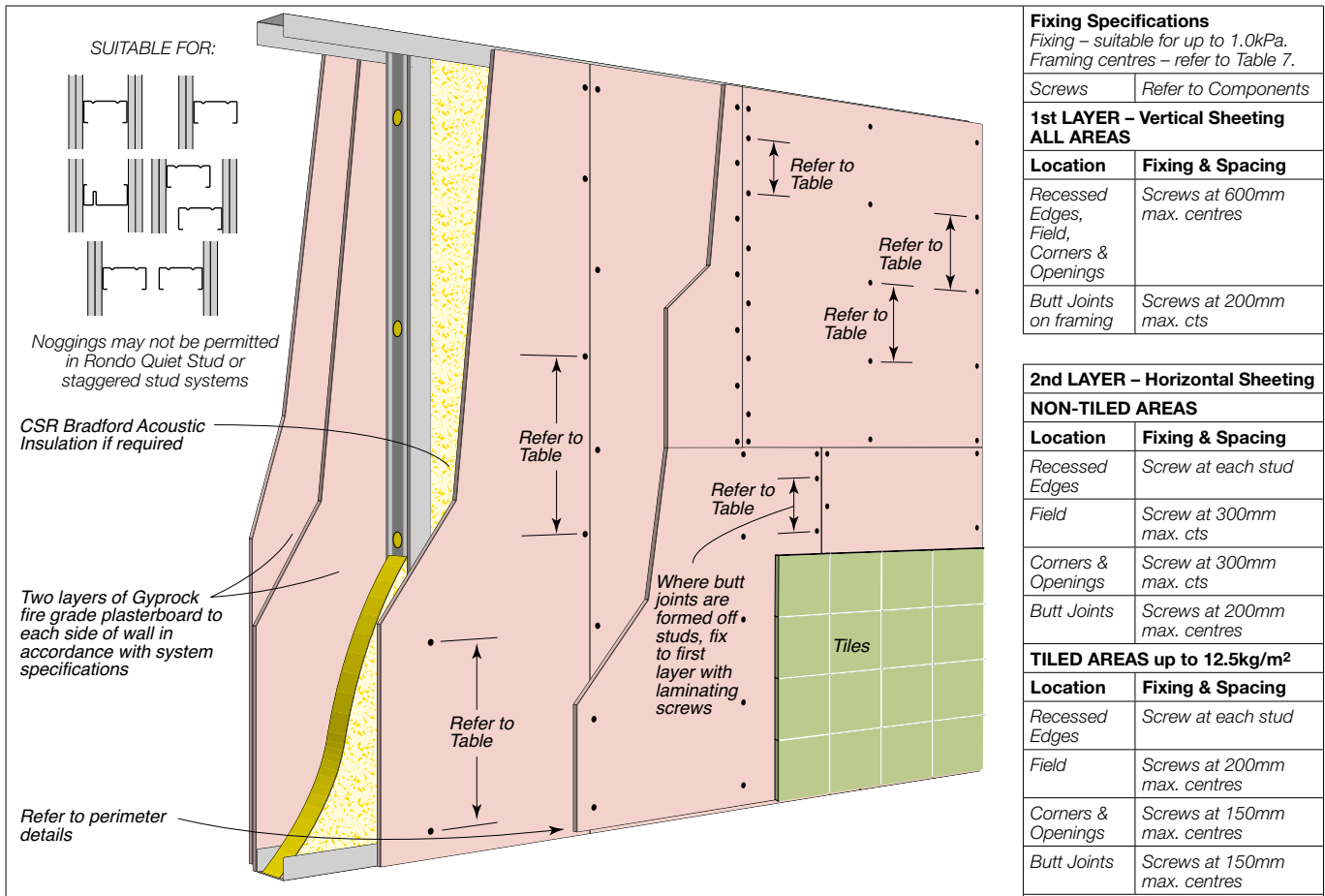
- Screw fix to each stud along recessed edges, beginning at the centre of the sheet and working towards the ends.
- Screw fix field of sheet to all studs as per the Fixing Specification Table.
- Screw fix butt joints and at all corners and around openings as per the Fixing Specification Table.
- Apply the next row of sheets, cutting the first sheet so that butt joints will be offset from adjacent sheets by a minimum of one stud spacing.

**Second Side**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- Cut sheets as necessary so that butt joints in adjacent sheets and on opposite sides of the wall are staggered on different studs.
- Apply and fix sheets as detailed for the first side.



**Figure 83: Fire Grade Plasterboard Fixing – Two Layer – 1st Layer Vertical + 2nd Layer Horizontal Sheeting – Non-Tiled Or Tiled Areas**



**Fixing Specifications**  
Fixing – suitable for up to 1.0kPa.  
Framing centres – refer to Table 7.

Screws	Refer to Components
<b>1st LAYER – Vertical Sheeting ALL AREAS</b>	
<b>Location</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field, Corners & Openings	Screws at 600mm max. centres
Butt Joints on framing	Screws at 200mm max. cts

<b>2nd LAYER – Horizontal Sheeting NON-TILED AREAS</b>	
<b>Location</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges	Screw at each stud
Field	Screw at 300mm max. cts
Corners & Openings	Screw at 300mm max. cts
Butt Joints	Screws at 200mm max. centres

<b>TILED AREAS up to 12.5kg/m<sup>2</sup></b>	
<b>Location</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges	Screw at each stud
Field	Screws at 200mm max. centres
Corners & Openings	Screws at 150mm max. centres
Butt Joints	Screws at 150mm max. centres

<b>TILED AREAS up to 32kg/m<sup>2</sup></b>	
<b>Location</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges	Screw at each stud
Field	Screws at 100mm max. centres
Corners & Openings	Screws at 100mm max. centres
Butt Joints	Screws at 100mm max. centres

**Notes On Fixing**

- If butt joints are required in the first layer, they must be formed on framing. Refer to appropriate system detail.
- Butt joints in adjacent sheets of a layer and between layers must be staggered by a minimum of 600mm.
- Provide up to 10mm gap at the bottom or the outer layer and appropriate clearance at the top of all layers.
- Place edge fasteners at 100mm maximum from top and bottom edges, but not through top tracks, and elsewhere 10 to 16mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side – First Layer**

- Apply sheets vertically (paper bound edges centred on studs), with the bottom edge of the sheet on the floor.
- Press the sheet firmly against the studs and screw fix as per the fixing table. Do not fix to intermediate studs at this time.

**Second Side – First Layer**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.

- Cut the first sheet to half width so that joints on opposite sides of the wall are located on different studs.
- Apply sheets vertically (paper bound edges centred on studs), with the bottom edge of the sheet on the floor.
- Screw fix this and subsequent full width sheets to all studs as per the Fixing Specification Table.
- Return to the first side and screw fix plasterboard to intermediate studs as per the Fixing Specification Table.

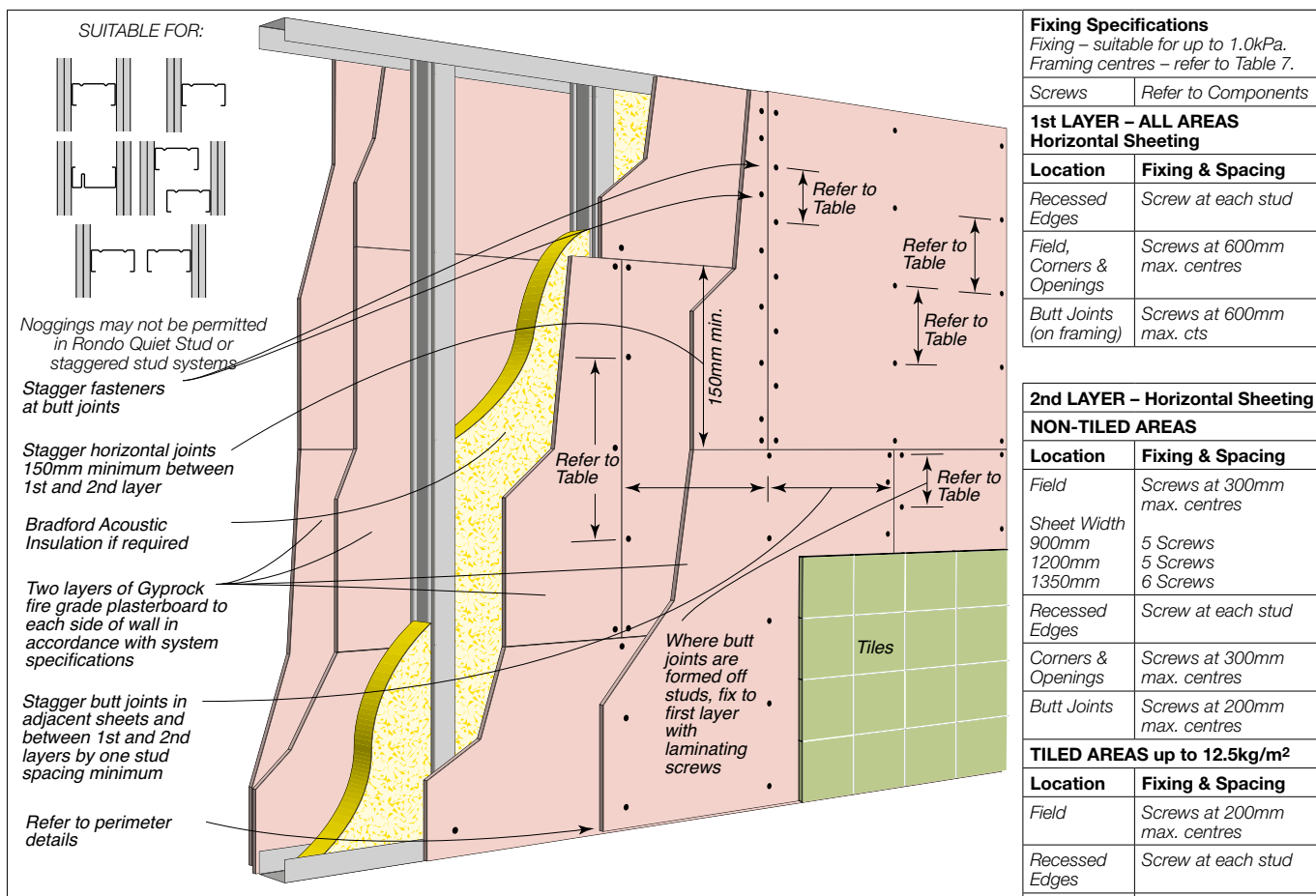
**First Side – Second Layer**

- Apply sheets horizontally (recessed edges at right angles to studs), leaving a 10mm max. gap between the bottom of the sheet and the floor.
- Screw fix as per the fixing table. Do not fix through top tracks.
- Form butt joints in accordance with Levels of Finish table. Offset butt joints in adjacent sheets by a minimum of one stud spacing. Fix as per the Fixing Specification Table.

**Second Side – Second Layer**

- Cut sheets as necessary so that butt joints in adjacent sheets are offset.
- Fix sheets as detailed for first side – second layer.

Figure 84: Fire Grade Plasterboard Fixing – Two Layer – Horizontal Sheeting – Non-Tiled Or Tiled Areas



Fixing Specifications	
Fixing – suitable for up to 1.0kPa. Framing centres – refer to Table 7.	
Screws	Refer to Components
1st LAYER – ALL AREAS Horizontal Sheeting	
Location	Fixing & Spacing
Recessed Edges	Screw at each stud
Field, Corners & Openings	Screws at 600mm max. centres
Butt Joints (on framing)	Screws at 600mm max. cts

2nd LAYER – Horizontal Sheeting NON-TILED AREAS	
Location	Fixing & Spacing
Field	Screws at 300mm max. centres
Sheet Width	
900mm	5 Screws
1200mm	5 Screws
1350mm	6 Screws
Recessed Edges	Screw at each stud
Corners & Openings	Screws at 300mm max. centres
Butt Joints	Screws at 200mm max. centres

TILED AREAS up to 12.5kg/m <sup>2</sup>	
Location	Fixing & Spacing
Field	Screws at 200mm max. centres
Recessed Edges	Screw at each stud
Corners & Openings	Screws at 150mm max. centres
Butt Joints	Screws at 150mm max. centres

TILED AREAS up to 32kg/m <sup>2</sup>	
Location	Fixing & Spacing
Field	Screws at 100mm max. centres
Recessed Edges	Screw at each stud
Corners & Openings	Screws at 100mm max. centres
Butt Joints	Screws at 100mm max. centres

**Notes On Fixing**

- Butt joints in adjacent sheets of a layer and between layers must be staggered by a minimum of one stud spacing.
- Provide up to 10mm gap at the bottom or the outer layer and appropriate clearance at the top of all layers.
- Place edge fasteners at 100mm maximum from top and bottom edges, but not through top tracks, and elsewhere 10 to 25mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First And Second Side – First Layer**

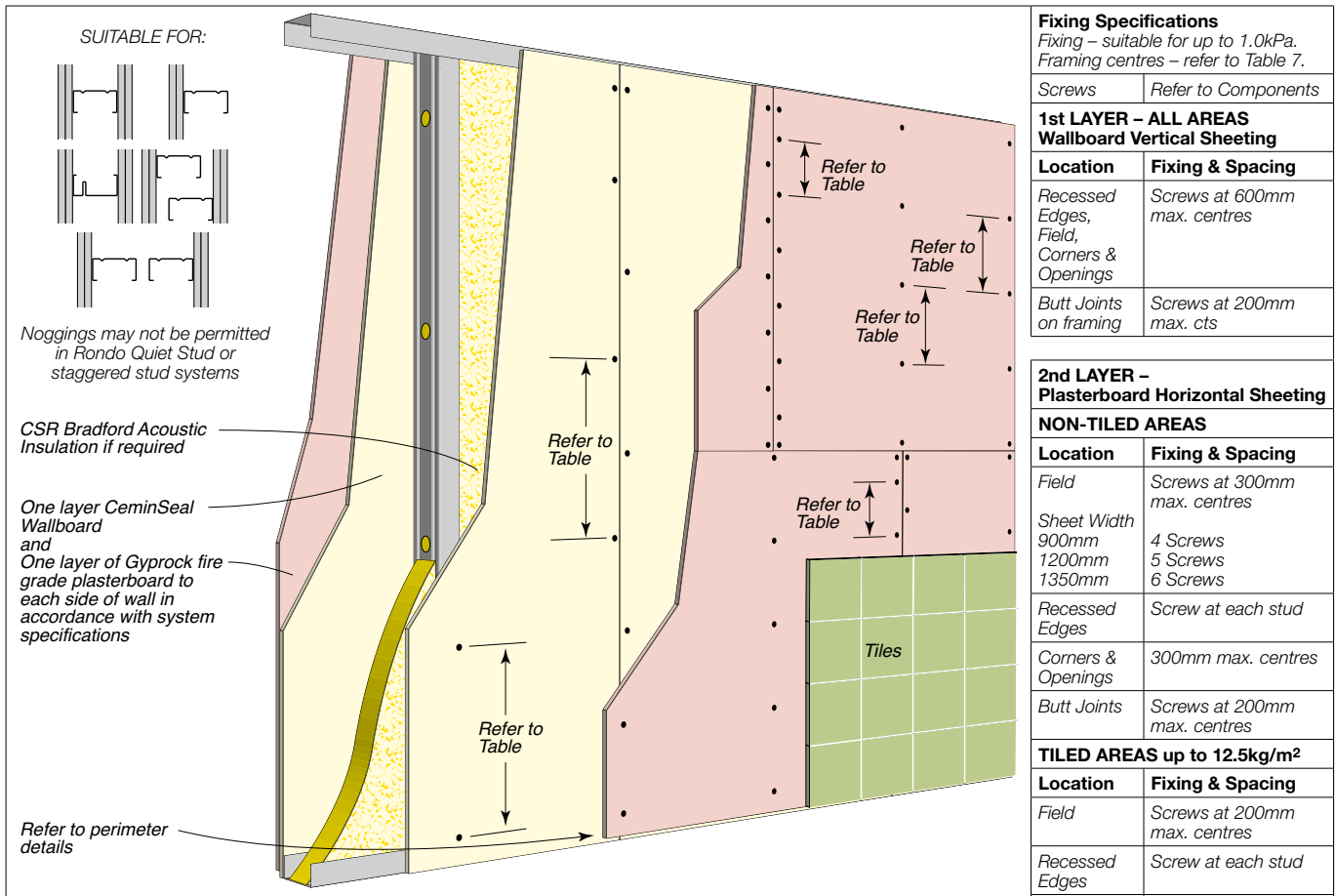
- Cut the top and bottom sheets to a suitable width so that second layer recessed joints will be offset a minimum 300mm from those in the first layer.
- Apply sheets horizontally (paper bound edges at right angles to studs) and with butt joints centred on stud flanges.
- Screw fix to each stud along recessed edges, beginning at the centre of the sheet and working towards the ends.
- Screw fix field of sheet, butt joints, corners and openings as per the Fixing Specification Table.
- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.

**First And Second Side – Second Layer**

- Apply sheets horizontally (paper bound edges at right angles to studs), leaving a 10mm max. gap between the bottom of the sheet and the floor.
- Screw fix to each stud along recessed edges, beginning at the centre of the sheet and working towards the ends.
- Centre butt joints on stud flanges and screw fix as per the Fixing Specification Table and staggered.
- Alternatively, form butt joints within 50mm of the centre between studs. Fix with laminating screws as per the Fixing Specification Table and staggered.
- Screw fix field of sheet, butt joints, corners and openings as per the Fixing Specification Table.
- Apply the next row of sheets, cutting the first sheet so that butt joints will be offset from adjacent sheets by a minimum of one stud spacing.
- Cut sheets as necessary to ensure appropriate clearance is provided at the head.



**Figure 85: Fire Grade Plasterboard Fixing – Two Layer – Vertical CeminSeal Wallboard + Horizontal Plasterboard – Non-Tiled Or Tiled Areas**



**Notes On Fixing**

- If butt joints are required in the first layer, they must be formed on framing. Refer to appropriate system detail.
- Butt joints in adjacent sheets of a layer must be staggered by a minimum of 600mm.
- Provide up to 10mm gap at the bottom or the outer layer and appropriate clearance at the top of all layers.
- Do not fix sheets to the top tracks.
- Where possible, sheeting should commence from the end facing the open side of the studs.

- Cut the first sheet to half width so that joints on opposite sides of the wall are located on different studs.
- Screw fix this and subsequent full width sheets to all studs as per the Fixing Specification Table.
- Return to the first side and screw fix wallboard to intermediate studs as per the Fixing Specification Table.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side – First Layer (CeminSeal Wallboard)**

- Apply sheets vertically (recessed edges centred on studs), with the bottom edge of the sheet on the floor.
- Press the sheet firmly against the studs and screw fix at 100mm max. from top and bottom of sheet and as per the Fixing Specification Table.
- Place edge fasteners at 12mm from sheet edge and 50mm from all corners.

**Second Side – First Layer (CeminSeal Wallboard)**

- Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.

**First Side – Second Layer (Plasterboard)**

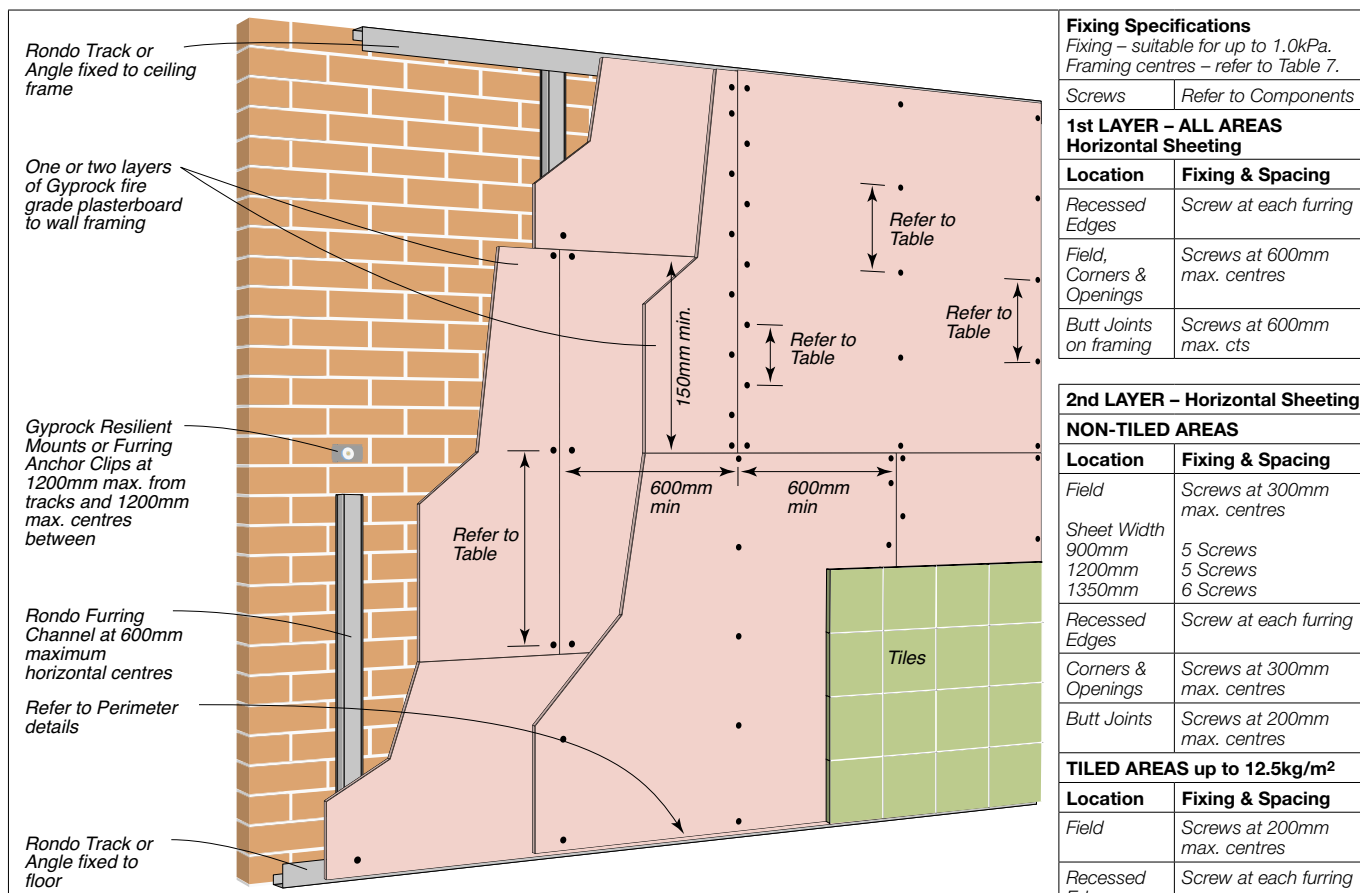
- Apply sheets horizontally, leaving a 10mm max. gap between the bottom of the sheet and the floor, and with butt joints centred on stud flanges.
- Press the sheet firmly against the studs and screw fix as per the Fixing Specification Table.
- Offset butt joints in adjacent sheets by a minimum of one stud spacing.

**Second Side – Second Layer (Plasterboard)**

- Cut sheets as necessary so that butt joints in adjacent sheets and on opposite sides of the wall are staggered on different studs.
- Apply and fix sheets as detailed for the first side – second layer.



Figure 86: Fire Grade Plasterboard Fixing – Two Layer – Masonry Wall With Furring Channel – Horizontal Sheeting – Non-Tiled Or Tiled Areas



Fixing Specifications	
Fixing – suitable for up to 1.0kPa. Framing centres – refer to Table 7.	
Screws	Refer to Components
1st LAYER – ALL AREAS Horizontal Sheeting	
Location	Fixing & Spacing
Recessed Edges	Screw at each furring
Field, Corners & Openings	Screws at 600mm max. centres
Butt Joints on framing	Screws at 600mm max. cts
2nd LAYER – Horizontal Sheeting NON-TILED AREAS	
Location	Fixing & Spacing
Field	Screws at 300mm max. centres
Sheet Width	
900mm	5 Screws
1200mm	5 Screws
1350mm	6 Screws
Recessed Edges	Screw at each furring
Corners & Openings	Screws at 300mm max. centres
Butt Joints	Screws at 200mm max. centres
TILED AREAS up to 12.5kg/m <sup>2</sup>	
Location	Fixing & Spacing
Field	Screws at 200mm max. centres
Recessed Edges	Screw at each furring
Corners & Openings	Screws at 150mm max. centres
Butt Joints	Screws at 150mm max. centres

**Notes On Fixing**

- Butt joints in adjacent sheets of a layer and between layers must be staggered by a minimum of one stud spacing.
- Provide up to 10mm gap at the bottom or the outer layer and appropriate clearance at the top of all layers.
- Do not fix sheets to the top tracks.
- Place edge fasteners at 100mm maximum from top and bottom edges, but not through top tracks, and elsewhere 10 to 25mm from sheet edge.
- Ensure all electrical/plumbing/insulation materials have been installed before sheeting.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side – First Layer**

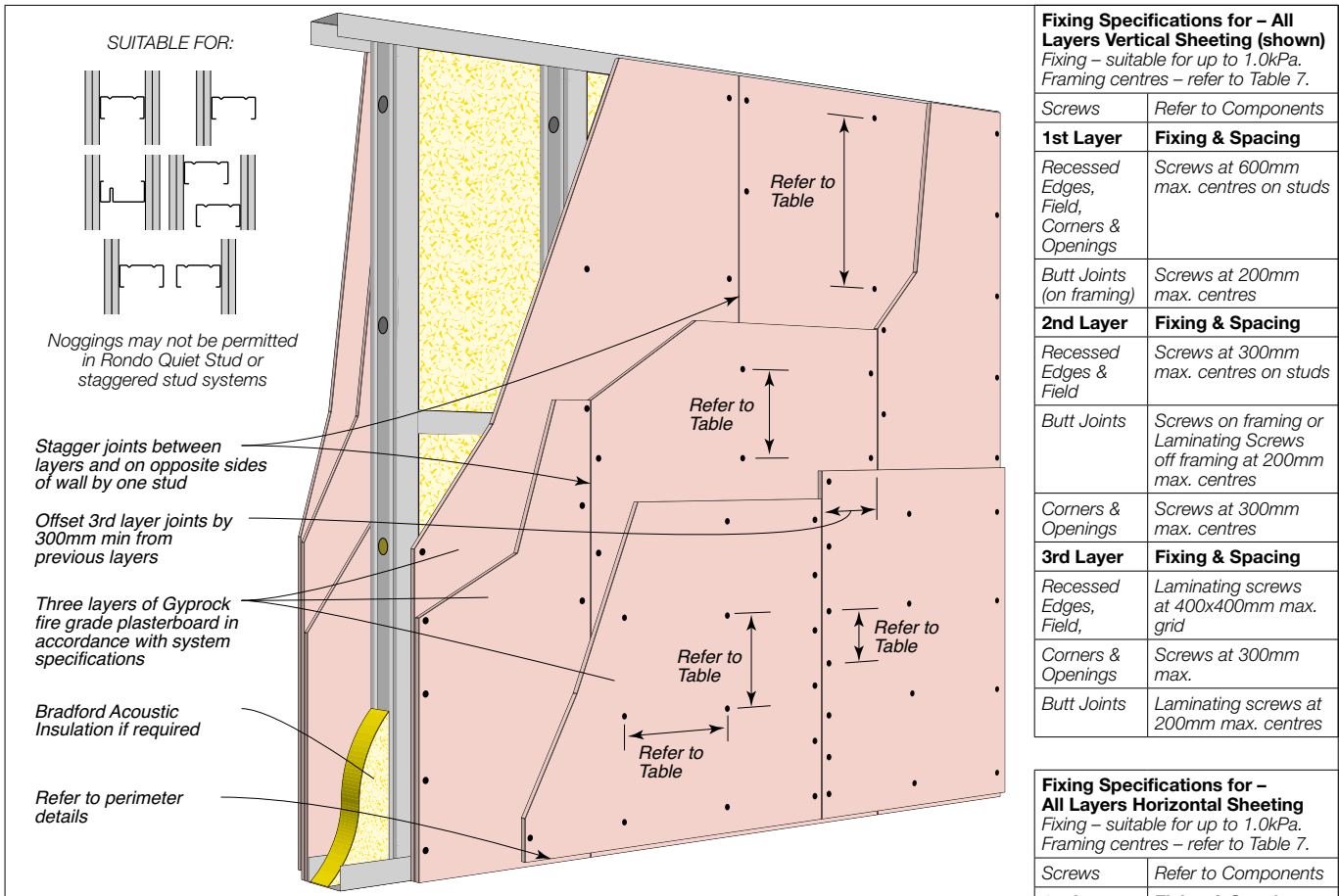
- Cut the top and bottom sheets to a suitable width so that second layer recessed joints will be offset a minimum 300mm from those in the first layer.
- Apply sheets horizontally (paper bound edges at right angles to furring) and with butt joints centred on furring.
- Screw fix to each furring along recessed edges, beginning at the centre of the sheet and working towards the ends.
- Screw fix field of sheet, butt joints, corners and openings as per the Fixing Specification Table.

**First And Second Side – Second Layer**

- Apply sheets horizontally (paper bound edges at right angles to furring), leaving a 10mm max. gap between the bottom of the sheet and the floor.
- Screw fix to each furring along recessed edges, beginning at the centre of the sheet and working towards the ends.
- Centre butt joints on furring and screw fix as per the Fixing Specification Table and staggered.
- Alternatively, form butt joints within 50mm of the centre between furring. Fix with laminating screws as per the Fixing Specification Table and staggered.
- Screw fix field of sheet, all corners and around openings as per the Fixing Specification Table.
- Apply the next row of sheets, cutting the first sheet so that butt joints will be offset from adjacent sheets by a minimum of one stud spacing.
- Screw fix recess edges, field of sheet, butt joints, corners and around openings as per the Fixing Specification Table.

NOTE: SINGLE LAYER SYSTEM  
Single layer systems using fire rated or non-fire rated Gyprock plasterboard are fixed to the same specifications as detailed for the 2nd layer.

Figure 87: Fire Grade Plasterboard Fixing – Three Layer – Vertical Or Horizontal Sheeting – Non-Tiled Areas



**Notes On Fixing**

- If butt joints are required in the first layer, they must be formed on framing and offset by 600mm min. in adjacent sheets. Refer to appropriate system detail.
- Offset vertical and horizontal recessed joints by 300mm minimum between layers.
- Provide up to 10mm gap at the bottom of the outer layer and appropriate clearance at the top of all layers.
- Place edge fasteners at 100mm maximum from top and bottom edges, but not through top track, and elsewhere 10 to 16mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**First Side – First Layer**

- Apply sheets with the bottom edge of the sheet on the floor. Vertical sheets to have recess joints centred on stud flanges. Horizontal sheets to have butt joints centred on stud flanges.
- Press the sheet firmly against the studs and fix as per the Fixing Specification Table. (Do not fix vertical sheets to intermediate studs at this time).

**Second Side – First Layer**

- Ensure insulation and services have been installed before

sheeting second side.

- Cut the first sheet to half width so that recessed joints on opposite sides of the wall are offset.
- Fix sheet completely as per the Fixing Specification Table.
- Return to the first side and screw fix plasterboard to intermediate studs as per the fixing table.

**First Side – Second Layer**

- Cut the first sheet to half width so that recessed joints are offset between layers.
- Apply sheets and screw fix as per the Fixing Specification Table.

**Second Side – Second Layer**

- Begin with a full width sheet and screw fix as per the fixing table.

**Both Sides – Third Layer**

- Offset vertical recessed joints by one stud spacing from previous layer, and offset horizontal recessed joints 300mm minimum from previous layers.
- Apply sheets vertically or horizontally, leaving a 10mm max. gap between the bottom of the sheet and the floor, and screw fix as per the Fixing Specification Table.

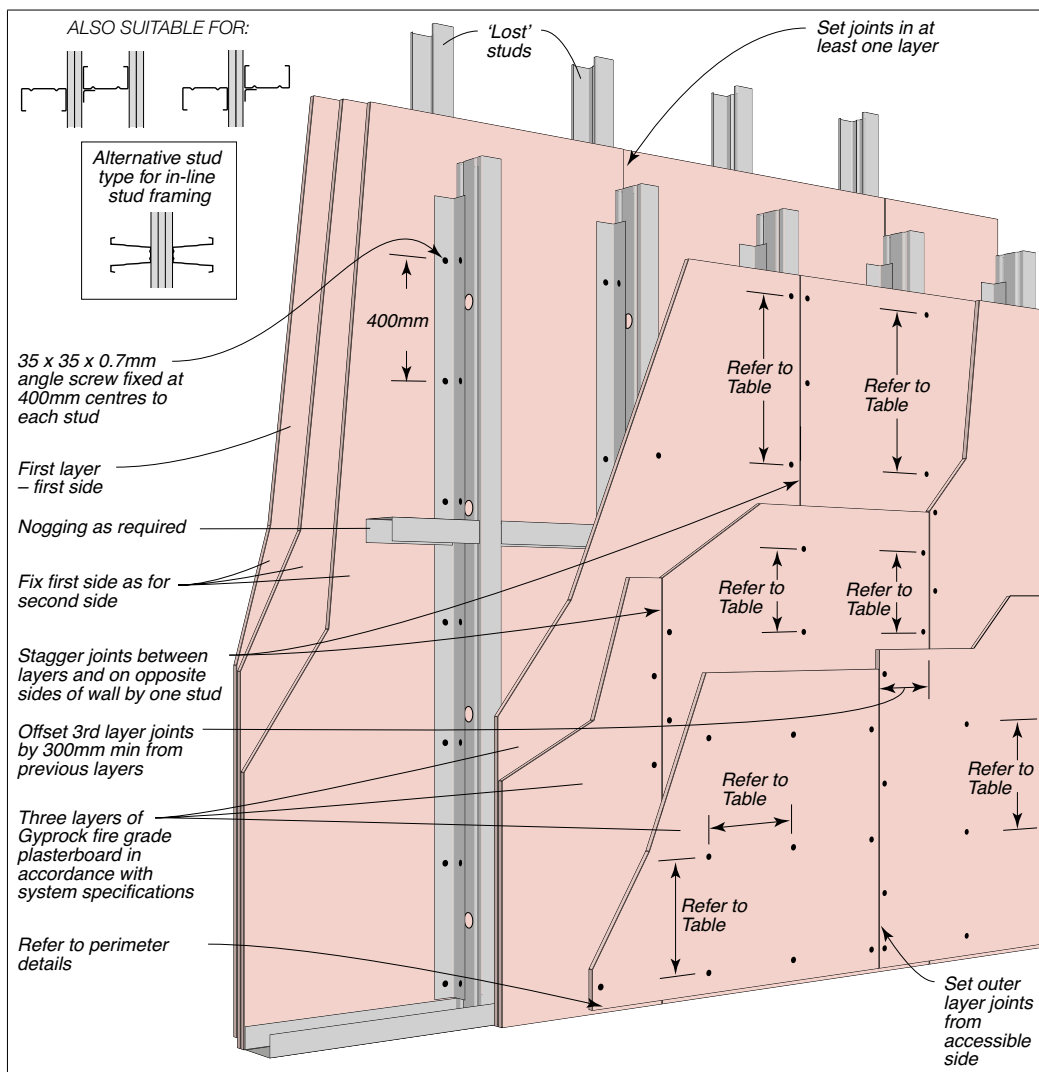
**Fixing Specifications for – All Layers Vertical Sheeting (shown)**  
Fixing – suitable for up to 1.0kPa. Framing centres – refer to Table 7.

Screws	Refer to Components
<b>1st Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field, Corners & Openings	Screws at 600mm max. centres on studs
Butt Joints (on framing)	Screws at 200mm max. centres
<b>2nd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges & Field	Screws at 300mm max. centres on studs
Butt Joints	Screws on framing or Laminating Screws off framing at 200mm max. centres
Corners & Openings	Screws at 300mm max. centres
<b>3rd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field,	Laminating screws at 400x400mm max. grid
Corners & Openings	Screws at 300mm max.
Butt Joints	Laminating screws at 200mm max. centres

**Fixing Specifications for – All Layers Horizontal Sheeting**  
Fixing – suitable for up to 1.0kPa. Framing centres – refer to Table 7.

Screws	Refer to Components
<b>1st Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field, Corners & Openings	Screws at 600mm max. centres on framing
Butt Joints (on framing)	Screws at 200mm max. centres
<b>2nd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges & Field	Screws at 300mm max. centres on studs
Butt Joints	Screws on framing or Laminating Screws off framing at 200mm max. centres
Corners & Openings	Screws at 300mm max. centres
<b>3rd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field,	Laminating screws at 400x400mm max. grid
Corners & Openings	Screws at 300mm max.
Butt Joints	Laminating screws at 200mm max. centres

Figure 88: Fire Grade Plasterboard Fixing – One, Two Or Three Layer – Suitable For Installation With Access From One Side Only – Vertical Or Horizontal Sheeting – Non-Loadbearing



**Fixing Specifications for – All Layers Vertical Sheeting (shown)**  
 Fixing – suitable for up to 1.0kPa.  
 Framing centres – refer to Table 7.

Screws	Refer to Components
<b>1st Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field, Corners & Openings	Screws at 600mm max. centres on studs
Butt Joints (on framing)	Screws at 200mm max. centres
<b>2nd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges & Field	Screws at 300mm max. centres on studs
Butt Joints	Screws on framing or Laminating Screws off framing at 200mm max. centres
Corners & Openings	Screws at 300mm max. centres
<b>3rd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field, Corners & Openings	Laminating screws at 400x400mm max. grid
Butt Joints	Laminating screws at 200mm max. centres

**Fixing Specifications for – All Layers Horizontal Sheeting**  
 Fixing – suitable for up to 1.0kPa.  
 Framing centres – refer to Table 7.

Screws	Refer to Components
<b>1st Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field, Corners & Openings	Screws at each studs
Butt Joints (on framing)	Screws at 200mm max. centres
<b>2nd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges & Field	Screws at 300mm max. centres on studs
Butt Joints	Screws on framing or Laminating Screws off framing at 200mm max. centres
Corners & Openings	Screws at 300mm max. centres
<b>3rd Layer</b>	<b>Fixing &amp; Spacing</b>
Recessed Edges, Field, Corners & Openings	Laminating screws at 400x400mm max. grid
Butt Joints	Laminating screws at 200mm max. centres

**Notes On Fixing**

- For one layer and two layer systems refer to fixing instructions appropriate for the number of layers used.
- Offset vertical and in horizontal recessed joints by 300mm minimum between layers.
- Provide up to 10mm gap at the bottom of the outer layer and appropriate clearance at the top of all layers.
- Place edge fasteners at 100mm maximum from top and bottom edges, but not through top track, and elsewhere 10 to 16mm from sheet edge.
- Where possible, sheeting should commence from the end facing the open side of the studs.

**Fixing Procedure**

For fastener specifications refer to Components section.

**Install framing (head and base tracks, and lost studs) and fix to supporting structure.**

**First Layer**

- Apply sheets with the bottom edge of the sheet on the floor. Vertical sheets to have recess joints centred on stud flanges. Horizontal sheets to have butt joints centred on stud flanges.

- Press the sheet firmly against the studs and fix as per the Fixing Specification Table.

**Second Layer**

- Cut the first sheet so that joints in the second layer do not align with joints in the first layer.
- Apply sheets vertically or horizontally and fix as per the Fixing Specification Table.

**Third Layer**

- Offset all joints by 300mm minimum from previous layer.
- Apply sheets vertically or horizontally, leaving a 10mm max. gap between the bottom of the sheet and the floor, and fix as per the Fixing Specification Table.

**Install wall framing (head/base tracks, studs and angle). Fix angle to lost studs and wall studs at 400mm max. cts.**

**All Layers**

- Install plasterboard same as previous instructions.

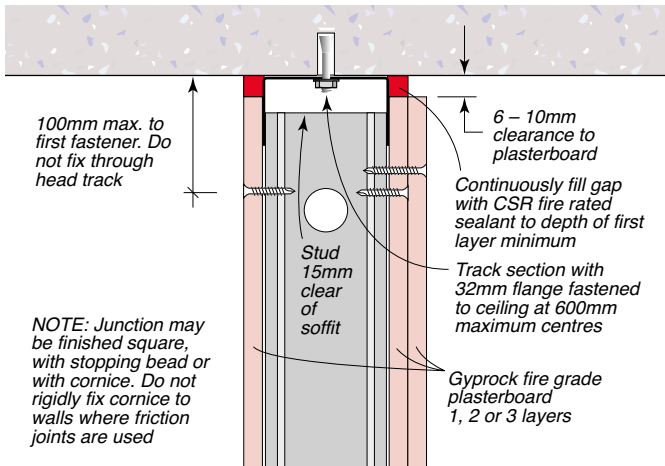
# Junctions & Penetrations – Fire Rated

## Wall Perimeter Details

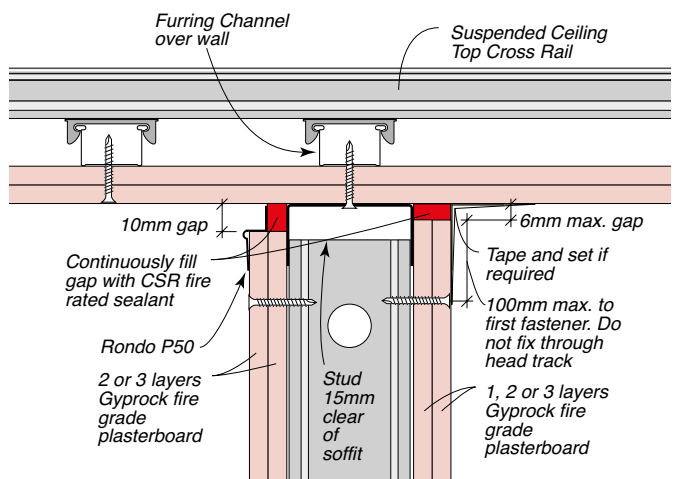
Appraisal FC 12946 unless noted.

Wall/ceiling junction details require engineer's approval where seismic loads apply. Typical fixings shown. For 150mm tracks, use two fixings to supporting structure, located approximately 20mm from flanges. These details are suitable for Gyprock fire grade plasterboard, and are also suitable for non-fire rated applications and where acoustic integrity is required. For further information on services penetrations of walls, floors and ceilings refer to the Clause C3.15 of the Building Code of Australia (BCA).

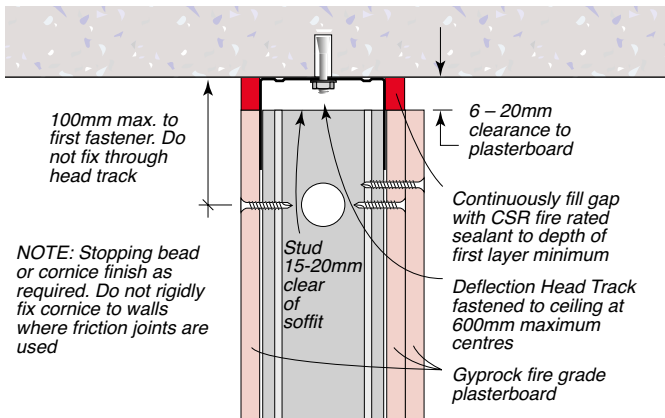
**Figure 89: Friction Fit Head**  
(Maintains the FRL of the wall system in which it is installed).



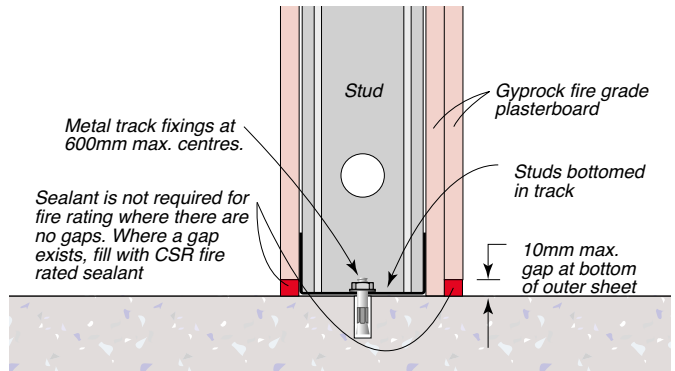
**Figure 92: Wall/Ceiling Junction**  
(Maintains the FRL of the wall system in which it is installed).



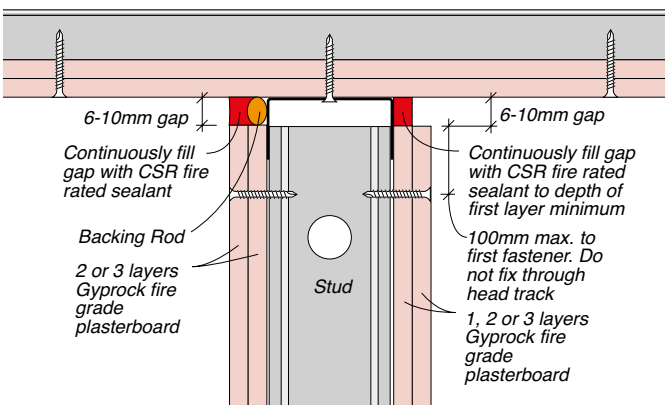
**Figure 90: Deflection Head**  
(Maintains the FRL of the wall system in which it is installed).



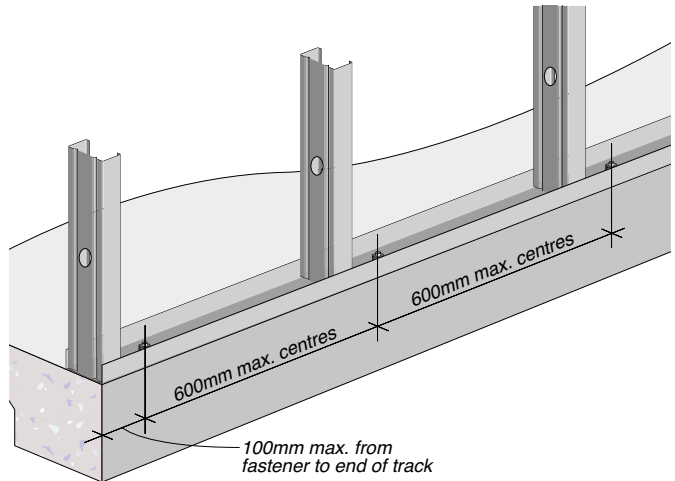
**Figure 93: Wall Base Detail**  
(Maintains the FRL of the wall system in which it is installed).



**Figure 91: Wall/Ceiling Junction**  
(Maintains the FRL of the wall system in which it is installed).



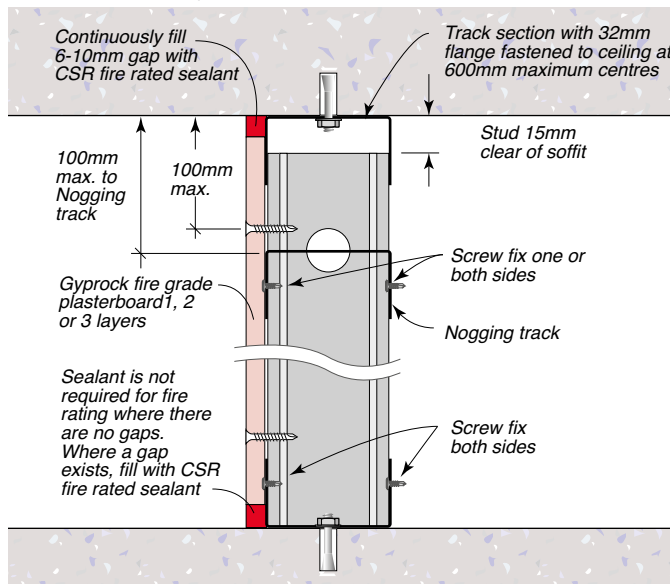
**Figure 94: Track Fixing Detail – Head Detail Similar**



**Figure 95: Head/Base – Studs Lined One Side Only With Additional Nogging Near Top Of Wall**

(Maintains the FRL of the wall system in which it is installed).

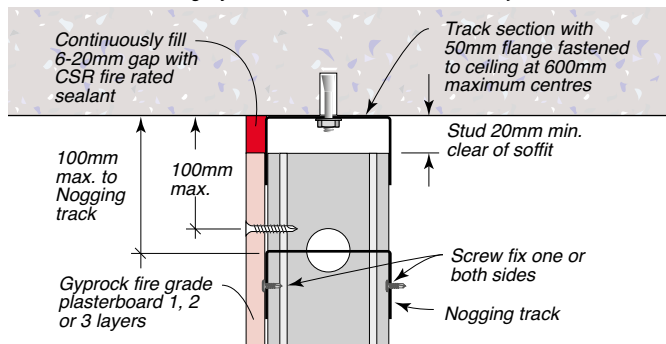
*NOTE: Soffit junction may be finished square, with stopping bead or with cornice. Do not rigidly fix cornice to walls where friction joints are used*



**Figure 96: Alternative Head – Studs Lined One Side Only With Additional Nogging Near Top Of Wall**

(Maintains the FRL of the wall system in which it is installed).

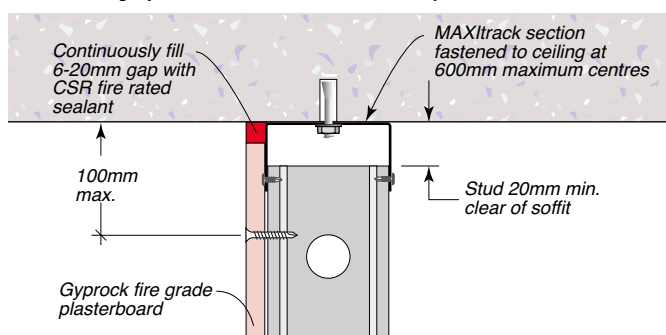
*NOTE: Soffit junction may be finished square, with stopping bead or with cornice. Do not rigidly fix cornice to walls where friction joints are used*



**Figure 97: Head – Studs Lined One Side Only With Slotted Head Track**

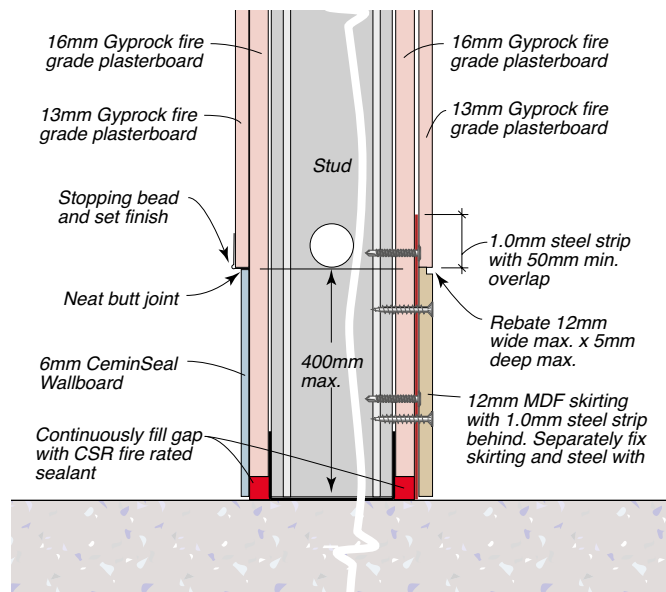
(Maintains the FRL of the wall system in which it is installed).

*NOTE: Junction may be finished square, with stopping bead or with cornice. Do not rigidly fix cornice to walls where friction joints are used*



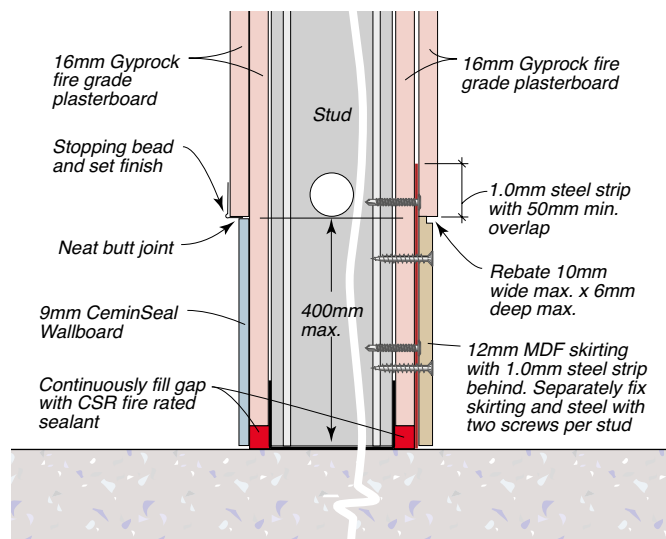
**Figure 98: Recessed Skirting Detail – FRL 90/90/90**

Appraisal: FCO 2208.



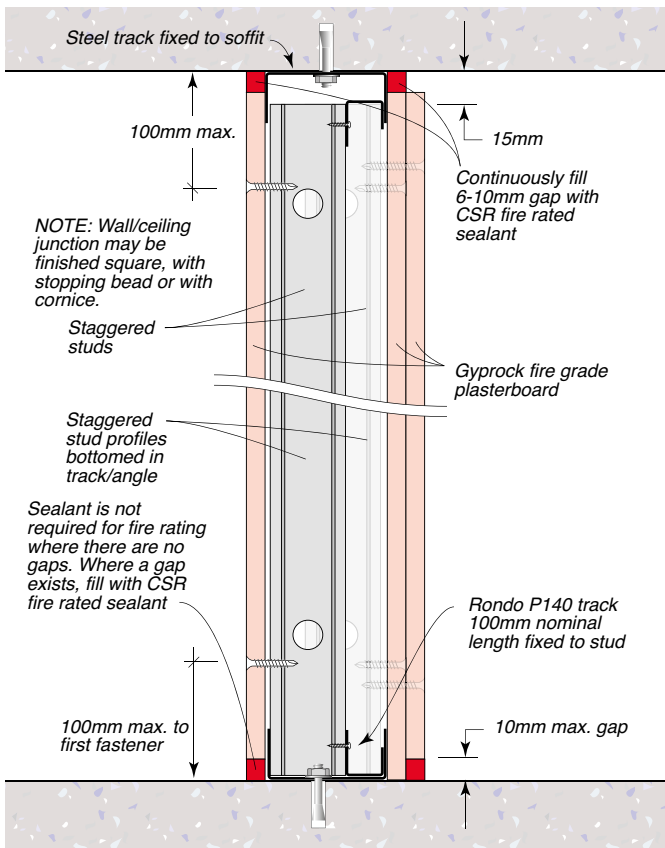
**Figure 99: Recessed Skirting Detail – FRL 120/120/120**

Appraisal: FCO 2208.

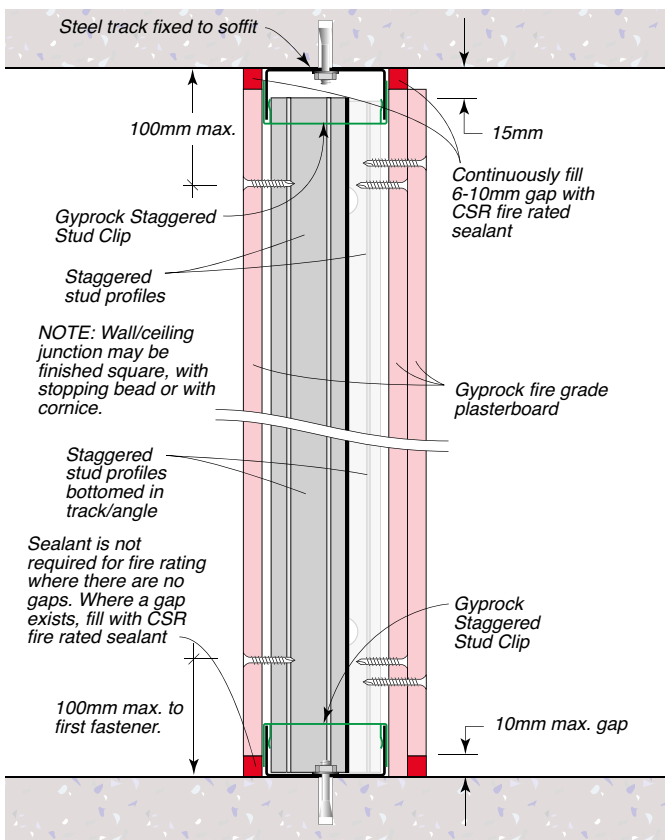




**Figure 100: Head/Base Detail – Staggered Stud With P140 Spacer**



**Figure 101: Head/Base Detail – Staggered Stud With Gyprock Staggered Stud Clip**



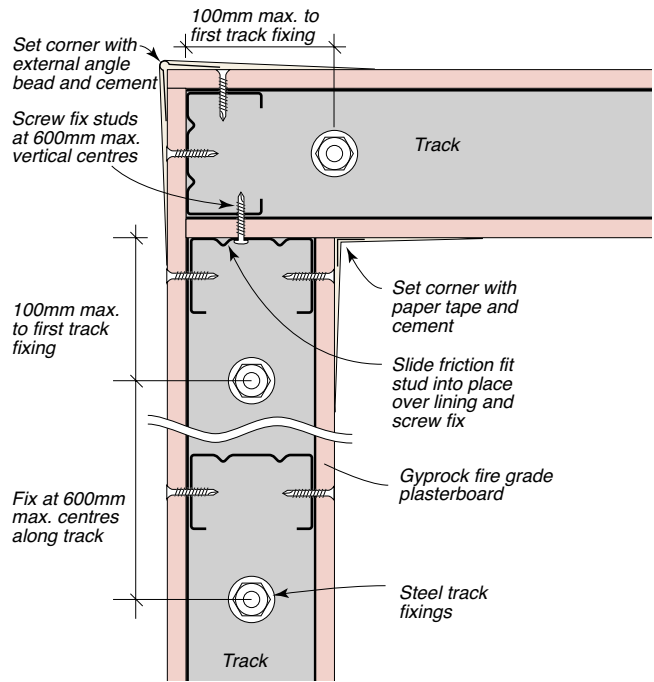
**Wall/Wall Junction Details**

Wall/wall junction details require engineer's approval where seismic loads apply.

These details are suitable for Gyprock fire grade plasterboard, and are also suitable for non-fire rated applications and where acoustic integrity is required.

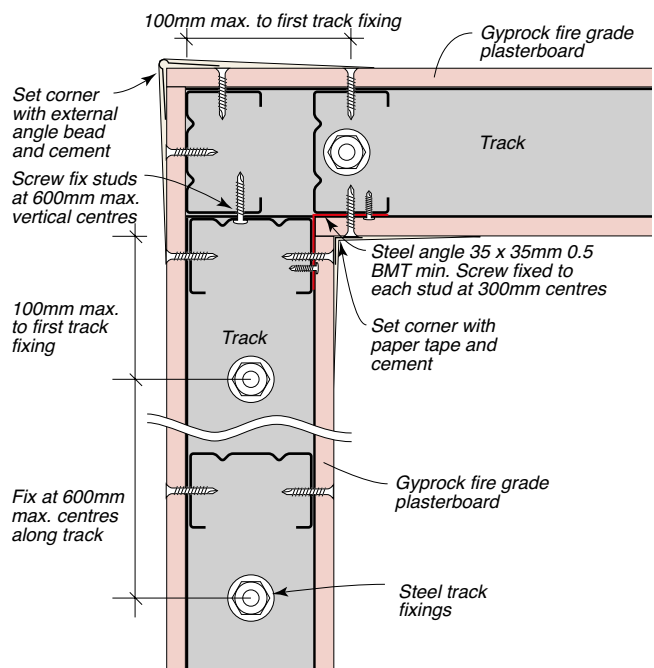
**Figure 102: Corner Detail – Plasterboard To Plasterboard Walls**

(Maintains the FRL of the wall system in which it is installed).



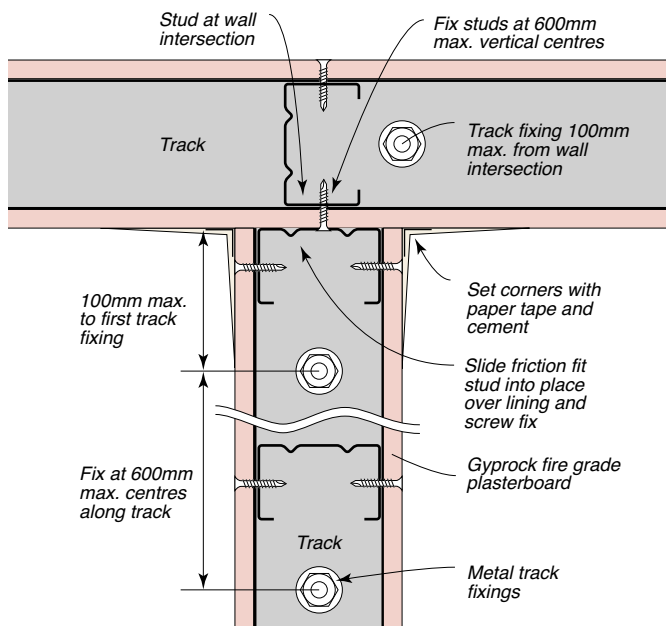
**Figure 103: Alternative Corner Detail – Plasterboard To Plasterboard Walls**

(Maintains the FRL of the wall system in which it is installed).

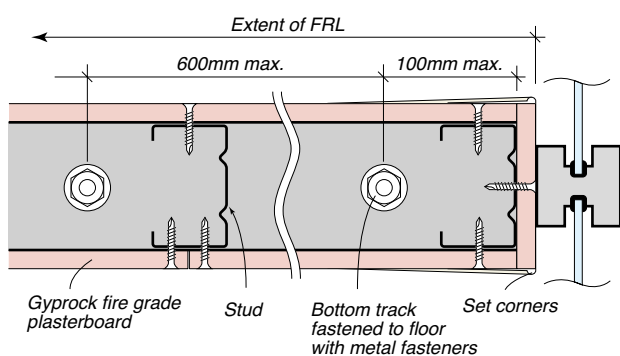




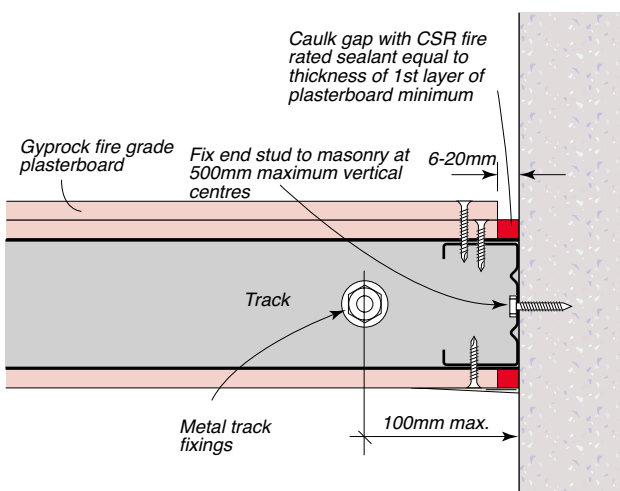
**Figure 104: Junction Detail – Plasterboard To Plasterboard Walls**  
(Maintains the FRL of the wall system in which it is installed).



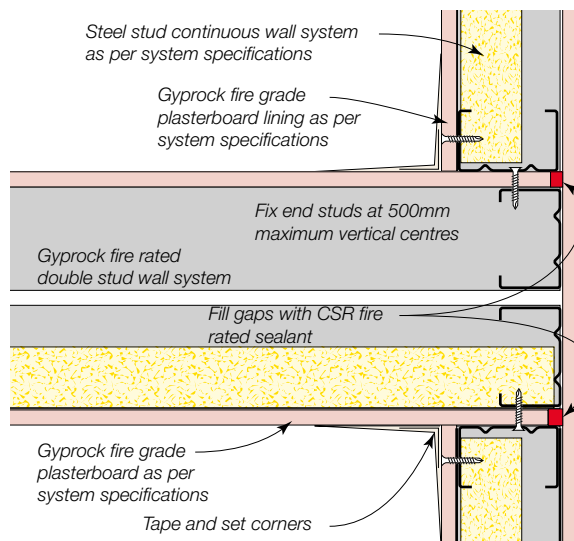
**Figure 105: Wall End Detail – Plasterboard Wall To Glazing Mullion**  
(Maintains the FRL of the wall system in which it is installed).



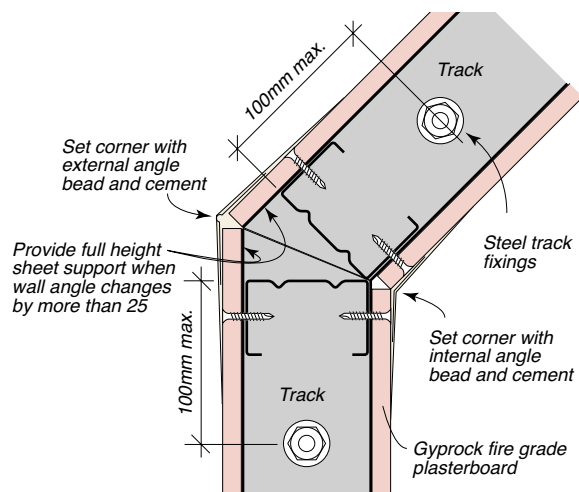
**Figure 106: Junction Detail – Plasterboard To Concrete or Masonry Wall**  
(Maintains the FRL of the wall system in which it is installed).



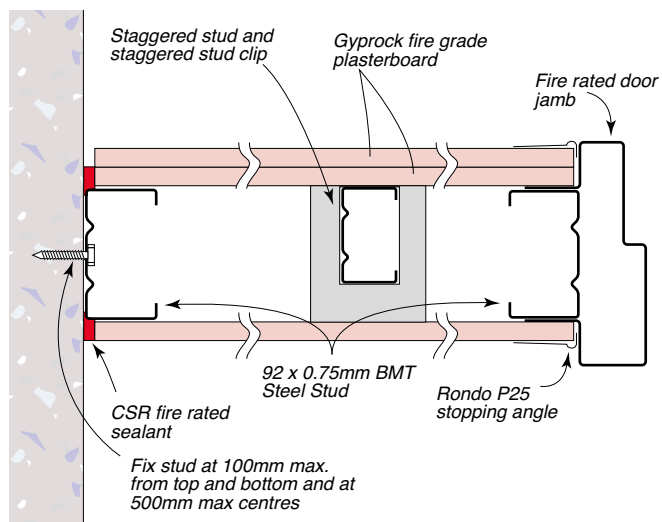
**Figure 107: Junction Detail – Double Stud Wall To Single Stud Wall**  
(Maintains the FRL of the wall system in which it is installed).



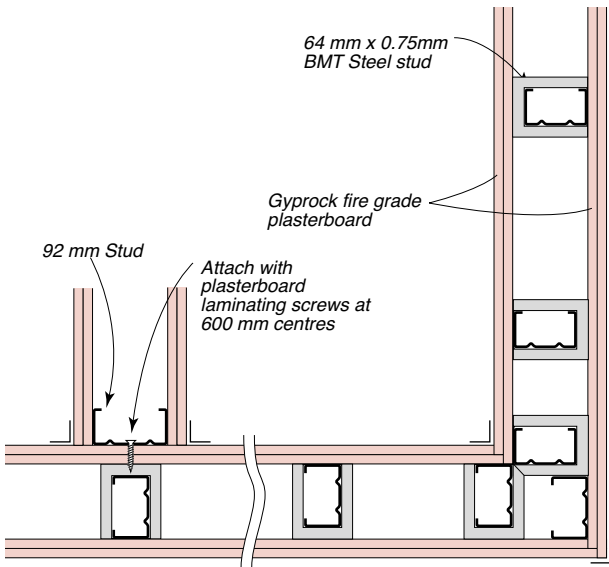
**Figure 108: Junction Detail – Angled Wall**  
(Maintains the FRL of the wall system in which it is installed).



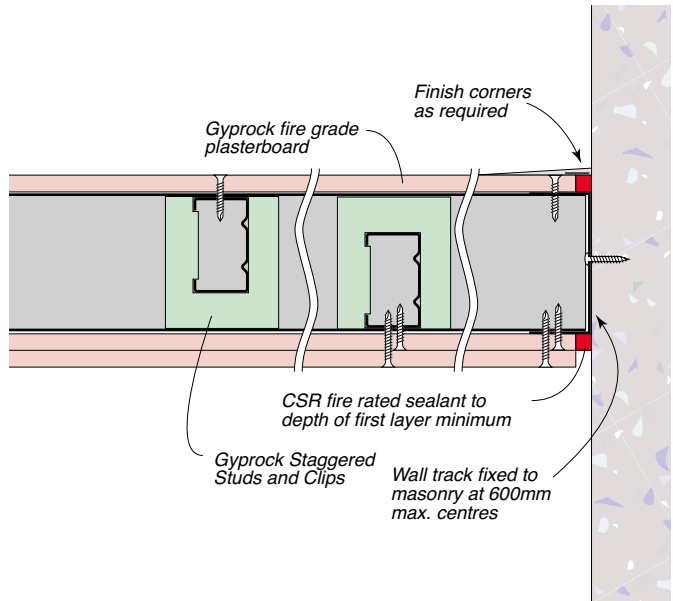
**Figure 109: Wall Junction And Door Jamb – Staggered Studs**  
(Maintains the FRL of the wall system in which it is installed).



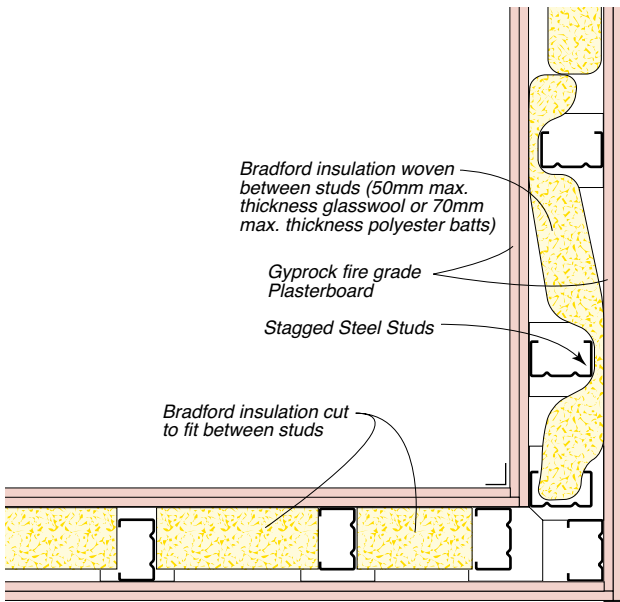
**Figure 110: Staggered Steel Stud Layout**  
(Maintains the FRL of the wall system in which it is installed).



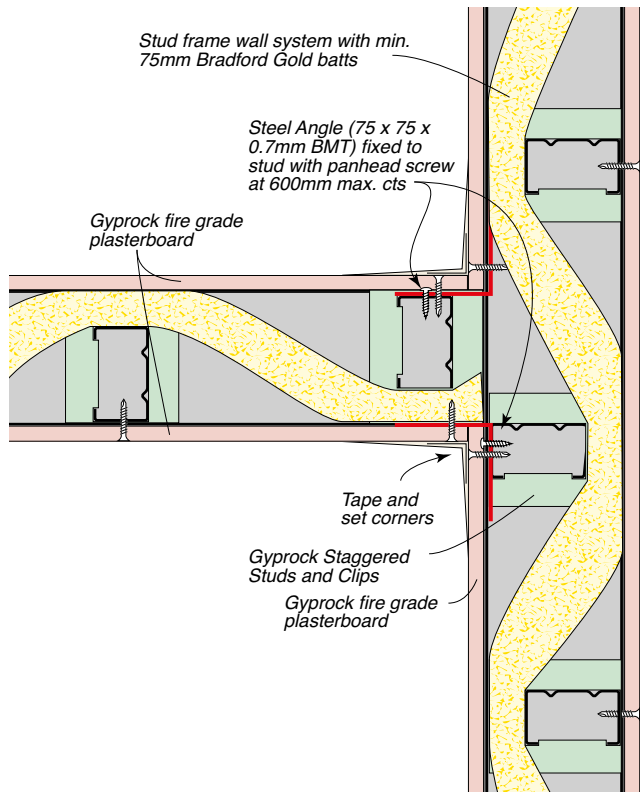
**Figure 112: Wall/Wall Junction – Staggered Stud Wall To Masonry Wall**  
(Maintains the FRL of the wall system in which it is installed).



**Figure 111: Staggered Stud Insulation Options**  
(Maintains the FRL of the wall system in which it is installed).



**Figure 113: Wall/Wall Junction – Staggered Studs**  
(Maintains the FRL of the wall system in which it is installed).

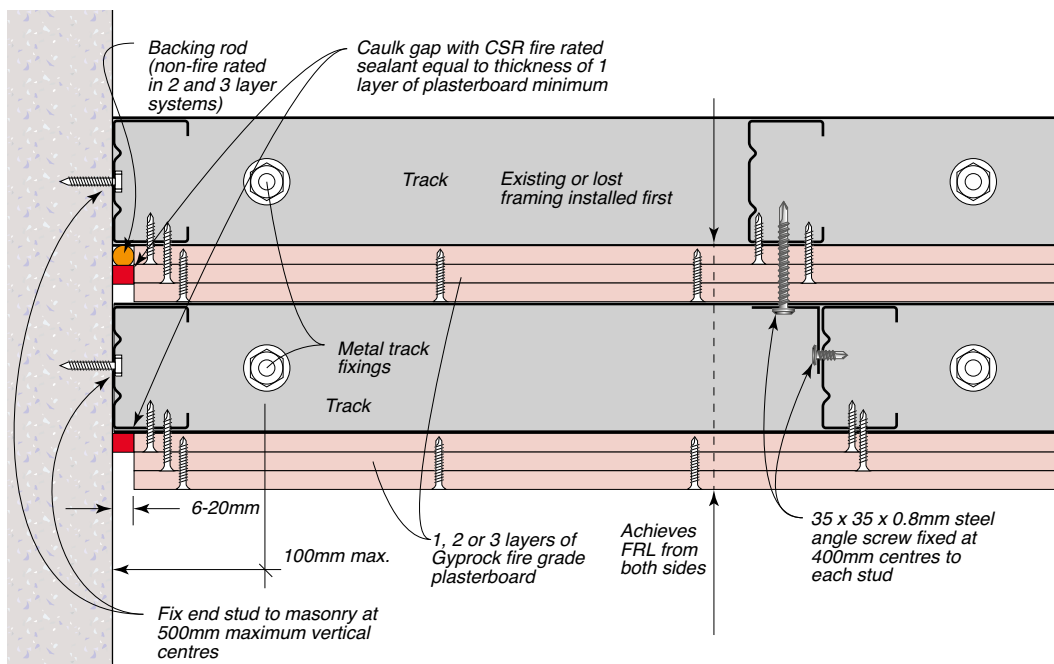


**Figure 114: Junction Detail – Lost Stud Plasterboard Wall Lined Both Sides To Masonry Wall – 1, 2 Or 3 Layers Plasterboard**

Appraisal FAR 3052.

SUITABLE FOR INSTALLATIONS WITH ACCESS FROM ONE SIDE ONLY.

(Maintains the FRL of the wall system in which it is installed).

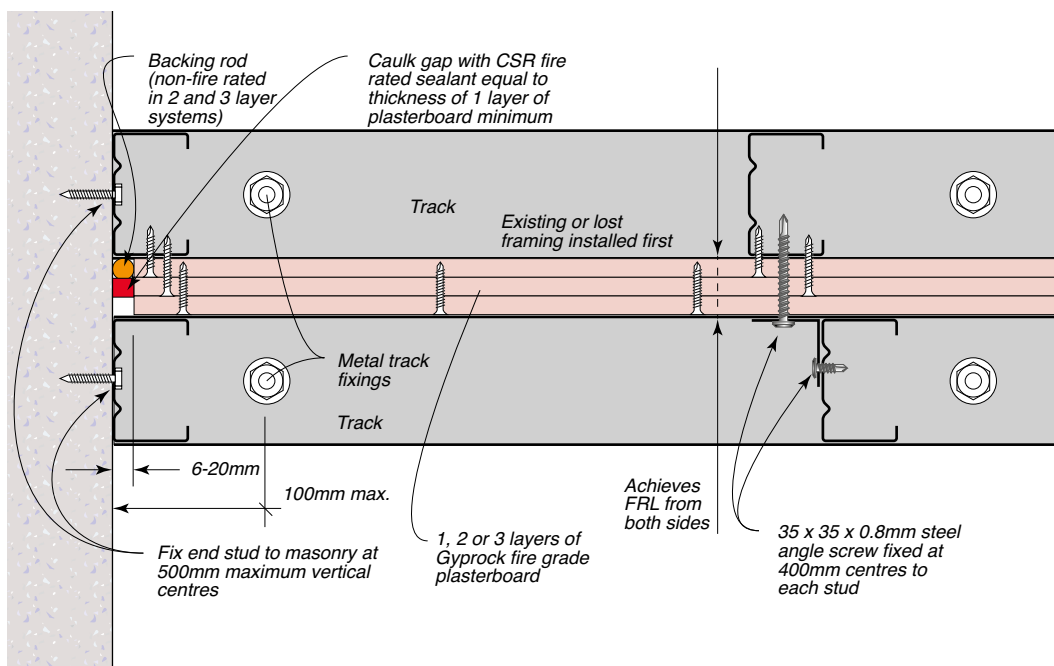


**Figure 115: Junction Detail – Lost Stud Plasterboard Wall Lined One Side To Masonry Wall – 1, 2 Or 3 Layers Plasterboard**

Appraisal FAR 3052.

SUITABLE FOR INSTALLATIONS WITH ACCESS FROM ONE SIDE ONLY.

(Maintains the FRL of the wall system in which it is installed).



## Tilt in-Place Spandrel – Fire Rated

Appraisal FC 12946.

### Tilt In Place Pre-Fabricated Spandrels

Clause C2.6 of the BCA requires the vertical separation of openings in external walls of buildings that are of type A construction. One method of achieving vertical separation and resisting the spread of fire between floors is via the use of spandrel walls.

The specification, engineering and construction of spandrel walls to meet project specific requirements is complex and CSR recommends that design approval is provided by the project fire engineer.

Spandrel walls built from light weight framing systems which are free standing and independent of window assemblies or curtain

wall systems can be built using CSR Gyprock deemed to satisfy wall systems. These wall systems require structural engineering input to ensure that wall framing is designed to withstand lateral loads that may be applied to the wall system .

Spandrel walls may be constructed prior to curtain wall installation where access from both sides is available.

Otherwise, walls may be pre-fabricated on site then tilted and fixed into position prior to the installation of the wall systems rear facing Gyprock fire grade plasterboard linings, as shown in the attached diagram. All framing elements and fixings such as concrete anchors must be in accordance with project structural engineer specified requirements.

Figure 116: Tilt In-Place Prefabricated Spandrel Wall – Section View

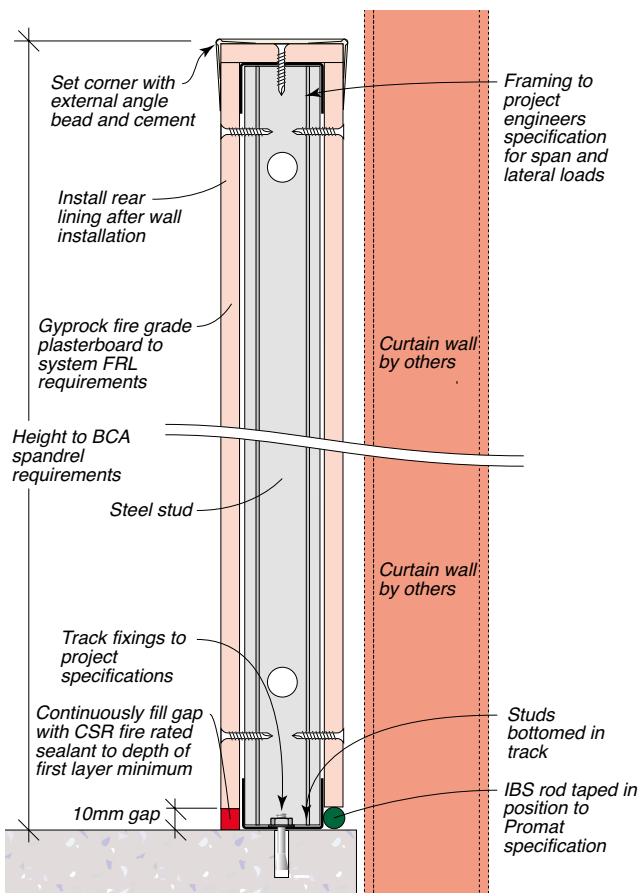
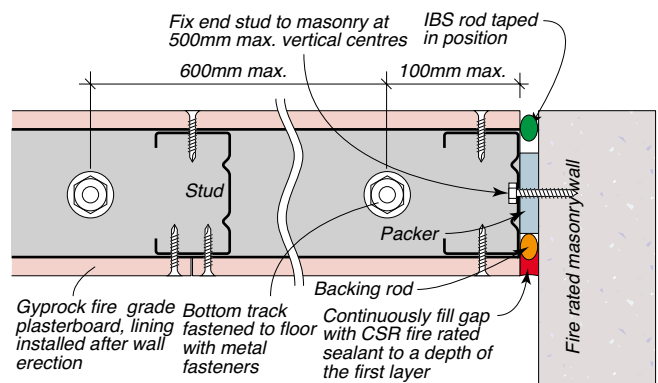


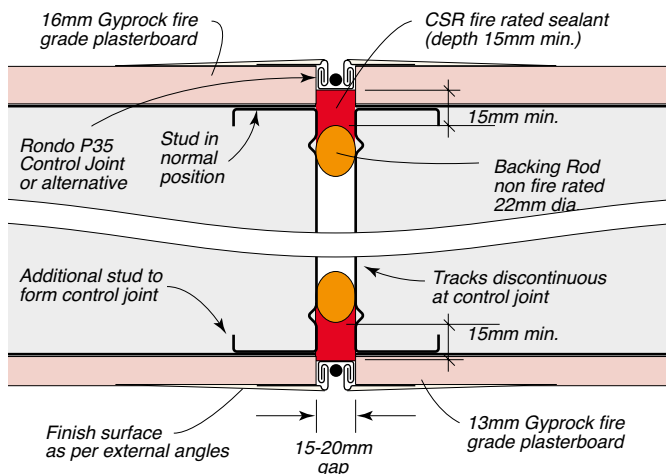
Figure 117: Tilt In-Place Spandrel Masonry Wall Junction



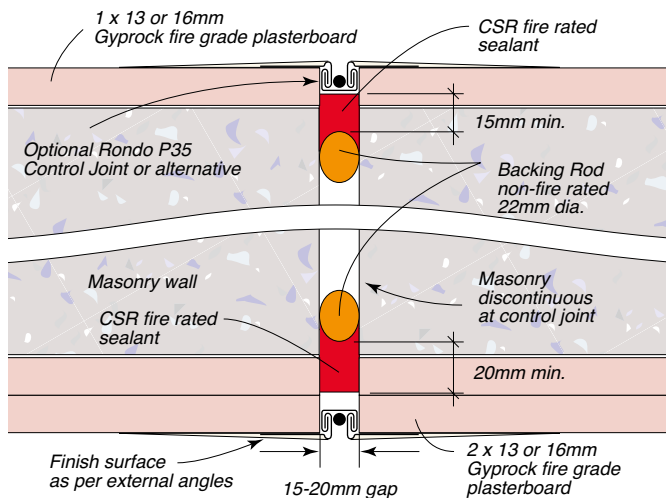
## Control Joints

These details are suitable for Gyprock fire grade plasterboard, and are also suitable for non-fire rated applications and where acoustic integrity is required.

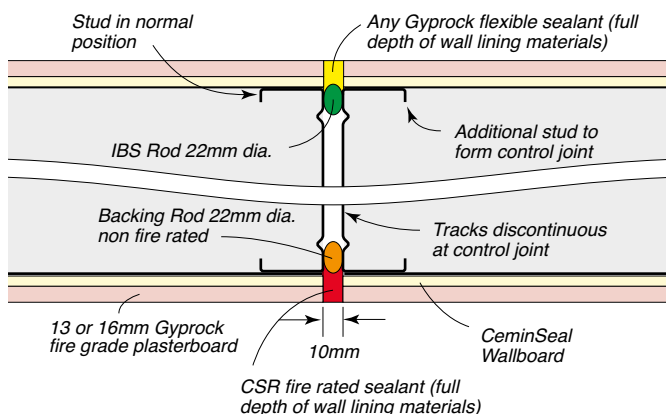
**Figure 118: Control Joint For Single Layer Stud Wall Systems**  
(Maintains the FRL of the wall system in which it is installed).



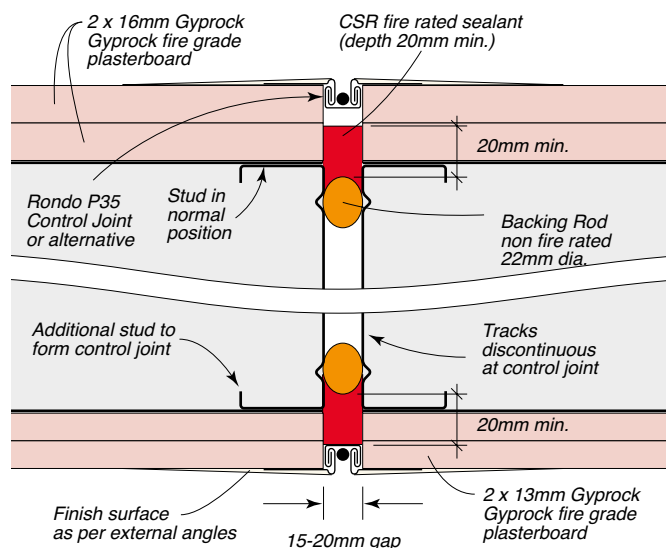
**Figure 119: Control Joint For Masonry Wall – Direct Fix Plasterboard**  
(Maintains the FRL of the wall system in which it is installed).



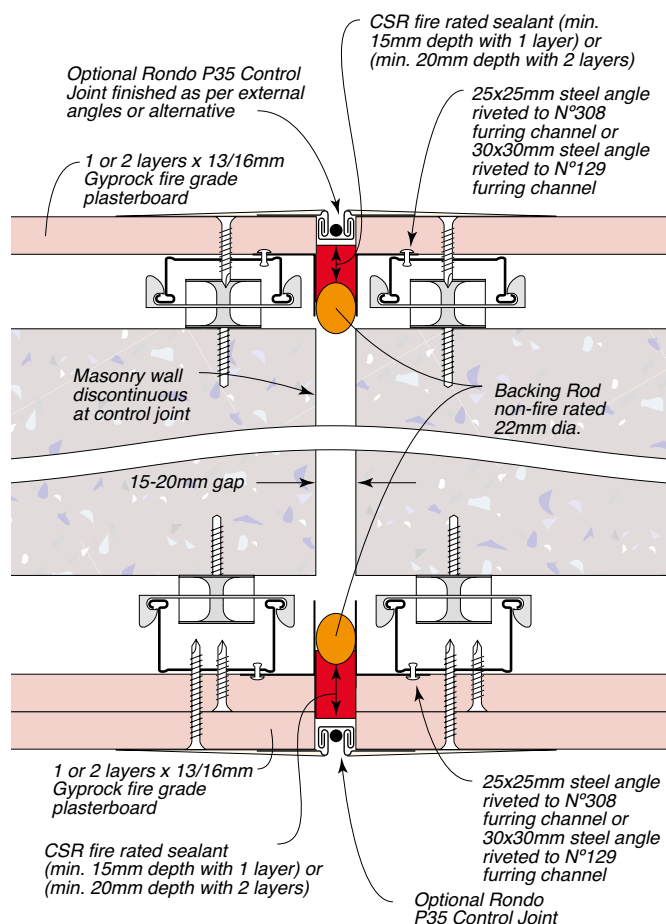
**Figure 120: Control Joint For Composite Wall Systems – First Layer CeminSeal Wallboard**  
(Maintains FRL of the wall system in which it is installed).



**Figure 121: Control Joint For Double Layer Stud Wall Systems**  
(Maintains the FRL of the wall system in which it is installed).



**Figure 122: Control Joint For Masonry Wall – Plasterboard On Furring Channel**  
(Maintains the FRL of the wall system in which it is installed).



### Penetrations in Steel Framed Walls – Pipes – Fire Rated

Appraisals as noted.

NOTE: Where insulation component of FRL is required for metal pipe penetrations, solutions are available by compliance with the clearance requirements of BCA Clause C3.15(a) or the Gyprock Silencer F.

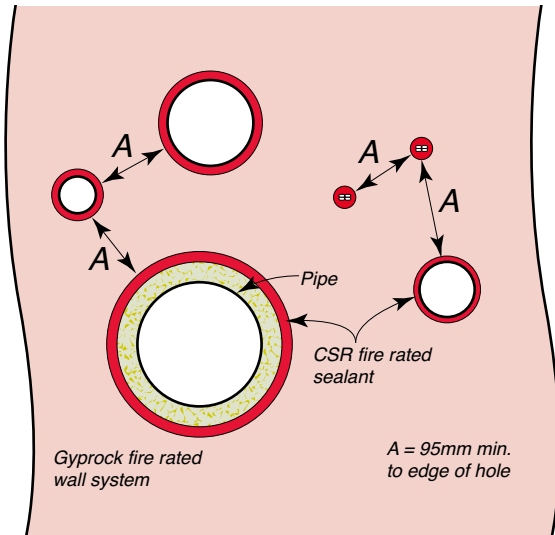
**Table 26: Pipe Sizes**

Nominal Pipe OD (mm)	Minimum Pipe Wall Thickness (mm)
32 to 65	0.91
66 to 101.6	1.22
101.6 to 125*	1.42
126 to 150*	1.63

\* Not suitable for brass services.

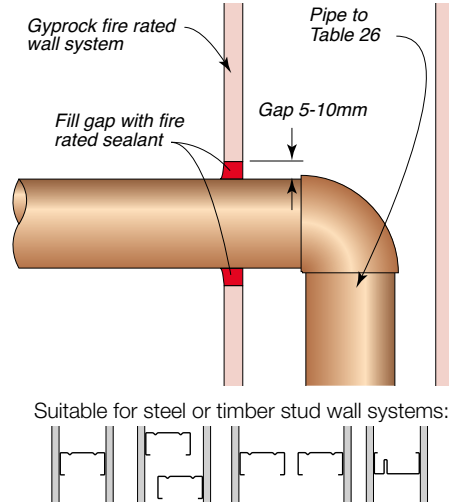
**Figure 123: Proximity Of Pipe Services**

Up To FRL -/120/- Or -/120/120. Appraisal: FCO 3198.



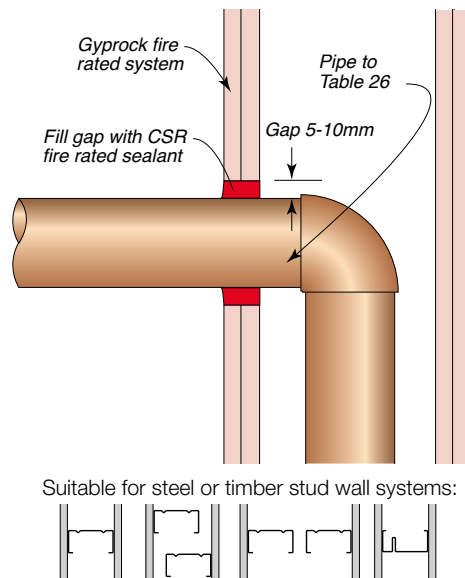
**Figure 125: Pipe Penetration – Copper, Brass & Ferrous Metals**

Up to FRL -/90/- . Appraisal: FCO 3198.



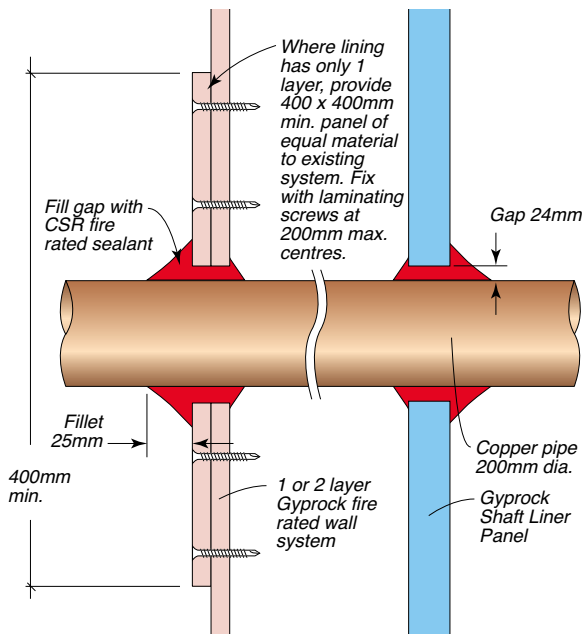
**Figure 126: Pipe Penetration – Copper, Brass & Ferrous Metals**

Up to FRL -/120/- . Appraisal: FCO 3198.



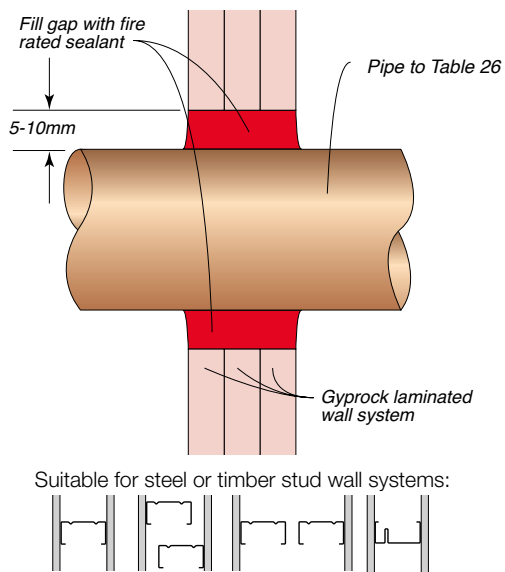
**Figure 124: 200mm Diameter Copper Pipe Penetration**

Up to FRL -/120/- . Appraisal: FCO 3050.

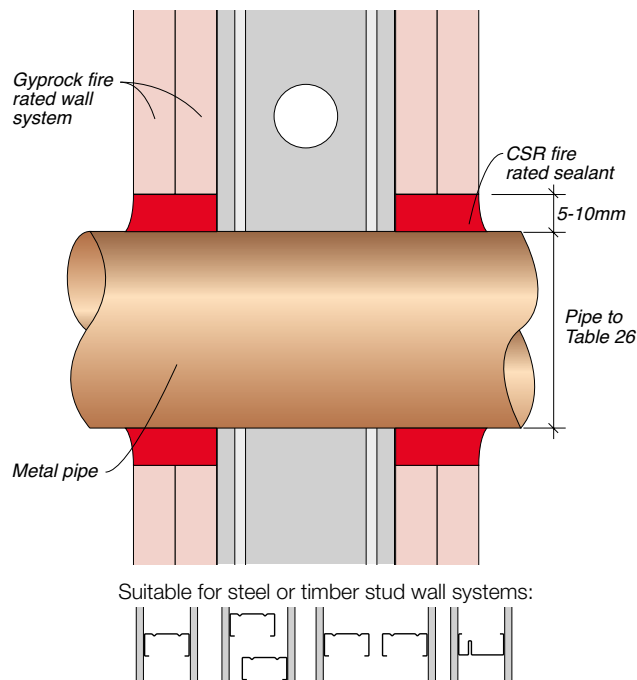




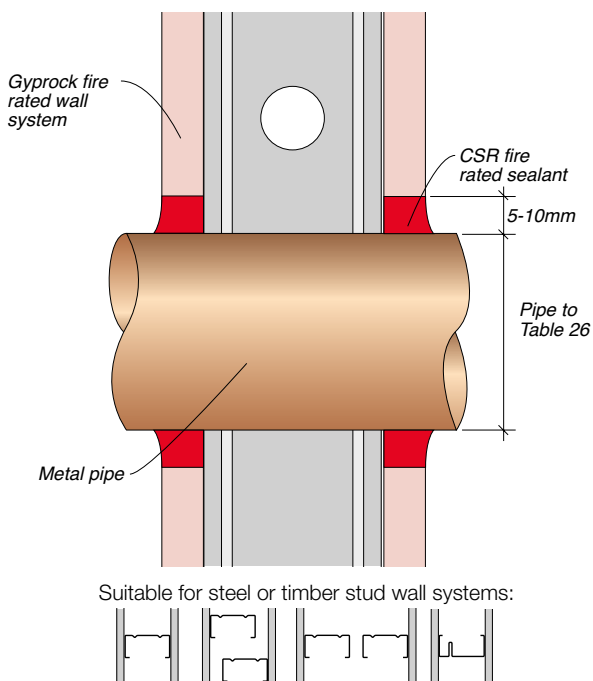
**Figure 127: Pipe Penetration – Copper, Brass & Ferrous Metals**  
Up to FRL –/120/–. Appraisal: FCO 3198.



**Figure 129: Pipe Penetration – Copper, Brass & Ferrous Metals**  
Up to FRL –/120/–. Appraisal: FCO 3198.



**Figure 128: Pipe Penetration – Copper, Brass & Ferrous Metals**  
Up to FRL –/90/–. Appraisal: FCO 3198.

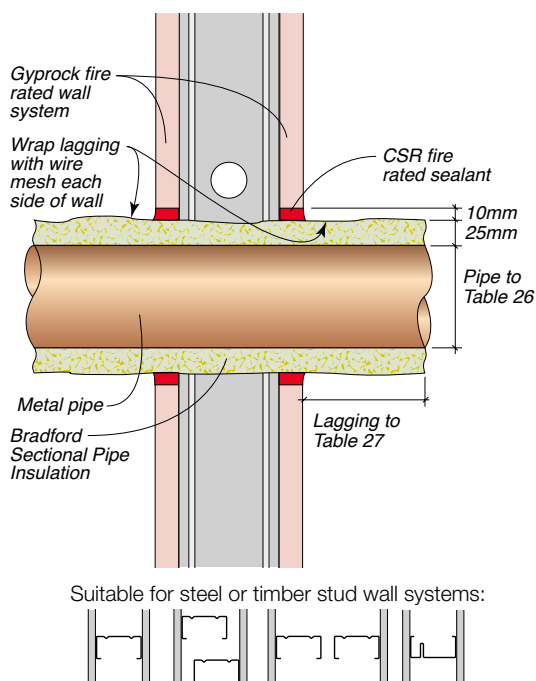


**Table 27: Lagging Requirements**

Nominal Size Ø (mm)	Length of lagging per side for required FRL (mm)		
	–/60/60	–/90/90	–/120/120
32 or less	350	400	450
40 to 150	650	700	750

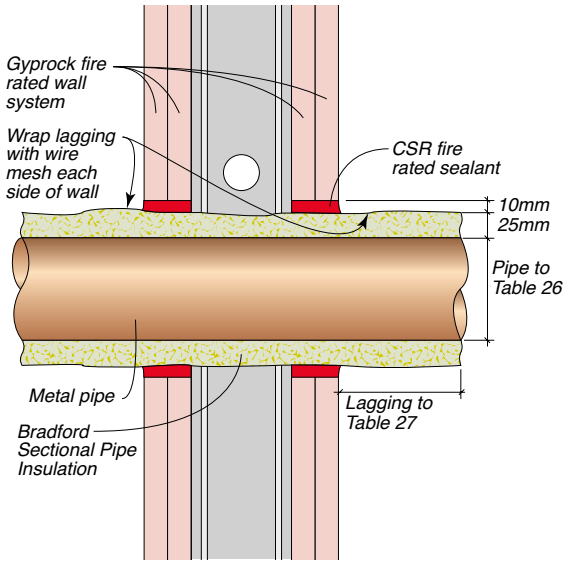
\*FCO 3198 Approved pipe lagging CSR Bradford SPI Sectional Pipe Lagging (25mm thick Bradford Fibertex Pipe Insulation).

**Figure 130: Lagged Pipe Penetration – Copper, Brass & Ferrous Metals**  
Up to FRL –/90/90. Appraisal: FCO 3198.

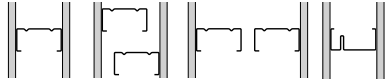


**Figure 131: Lagged Pipe Penetration – Copper, Brass & Ferrous Metals**

Up to FRL –/120/120. Appraisal: FCO 3198.



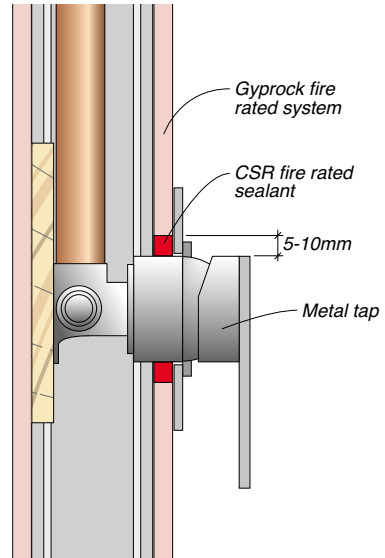
Suitable for steel or timber stud wall systems:



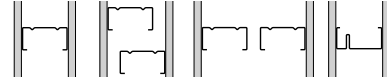
**Figure 133: Tap Penetration – Copper, Brass & Ferrous Metals**

Up to FRL –/90/-. Appraisal: FCO 3198.

Not suitable where non-combustible construction is required.

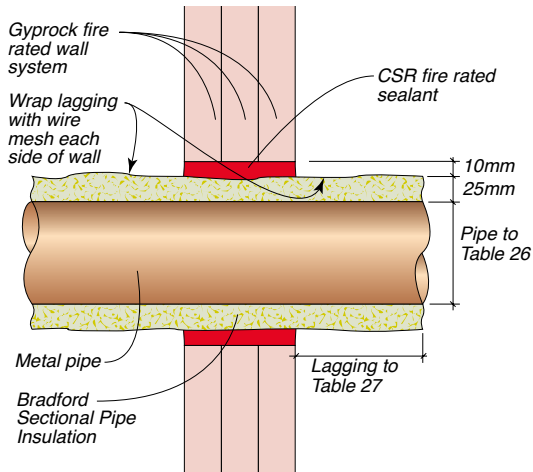


Suitable for steel or timber stud wall systems:



**Figure 132: Lagged Pipe Penetration – Copper, Brass & Ferrous Metals**

Up to FRL –/120/120. Appraisal: FCO 3198.



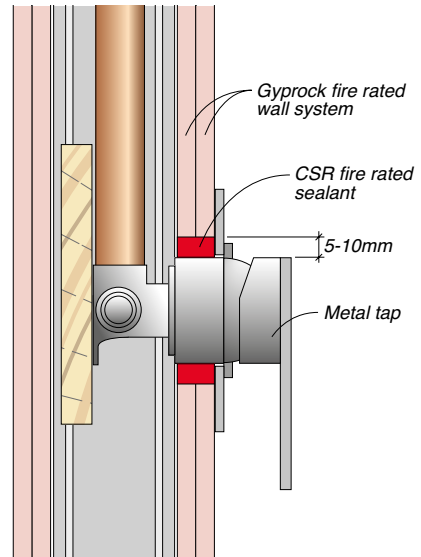
Suitable for laminated wall systems:



**Figure 134: Tap Penetration – Copper, Brass & Ferrous Metals**

Up to FRL –/120/-. Appraisal: FCO 3198.

Not suitable where non-combustible construction is required.



Suitable for steel or timber stud wall systems:



Figure 135: Penetration Detail – 200mm Ø Metal Pipe  
6 to 20mm from Wall/Soffit Junction  
(Up to -/120/-) Appraisal: FCO 3050.

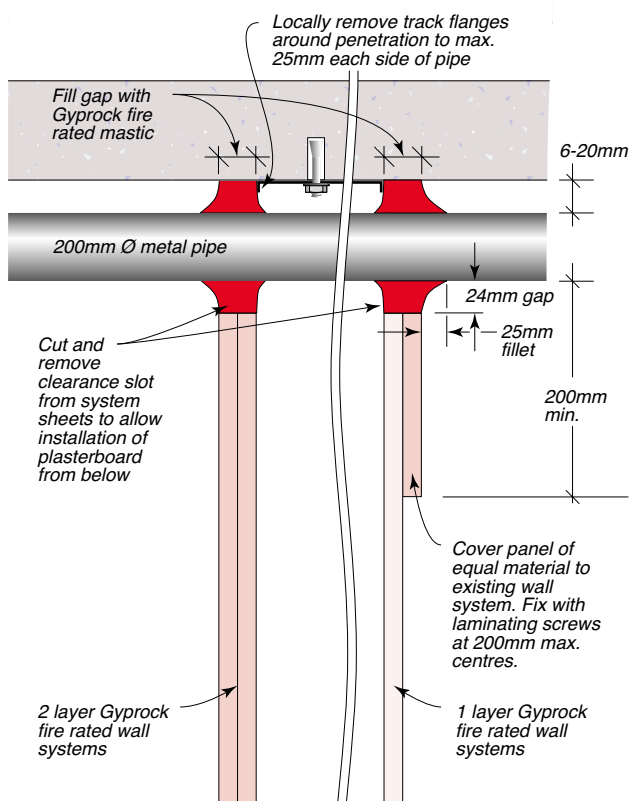
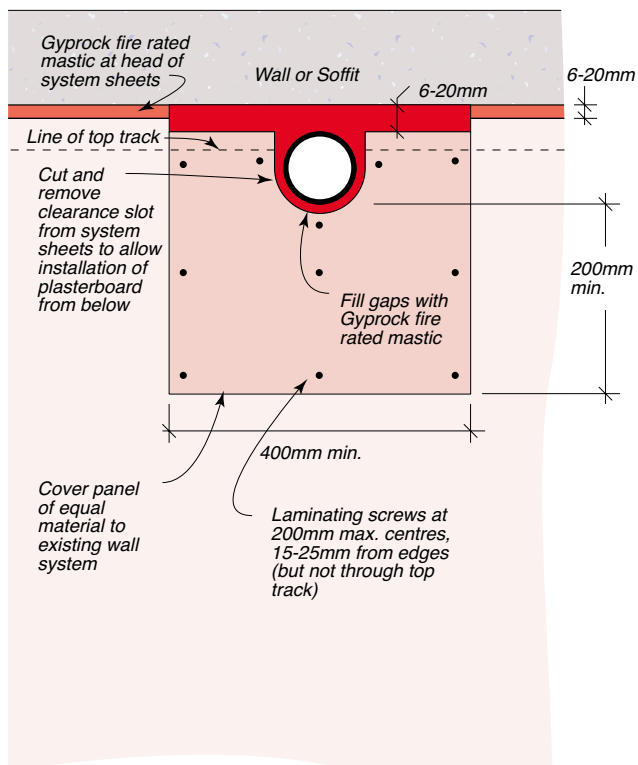
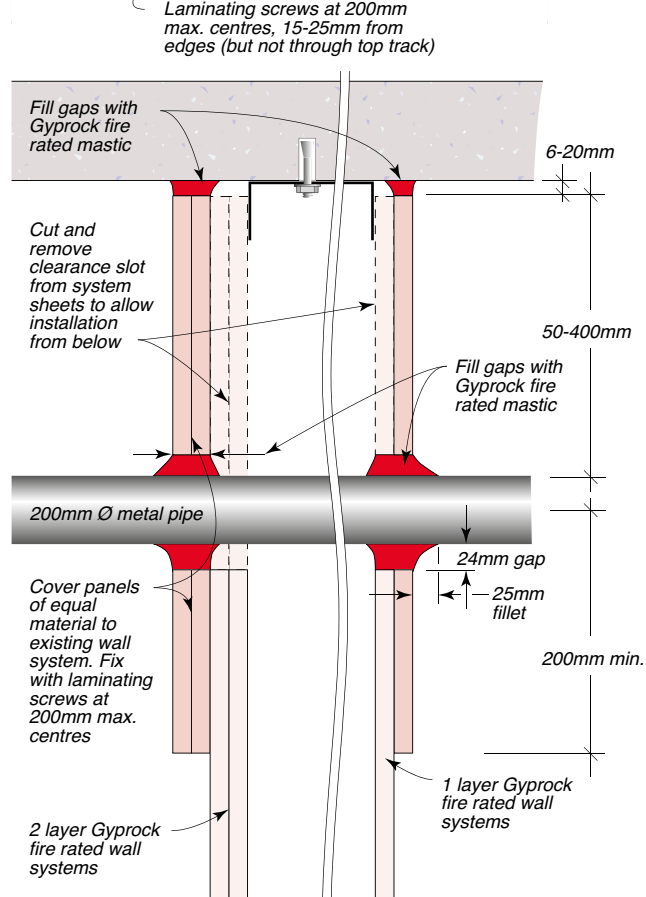
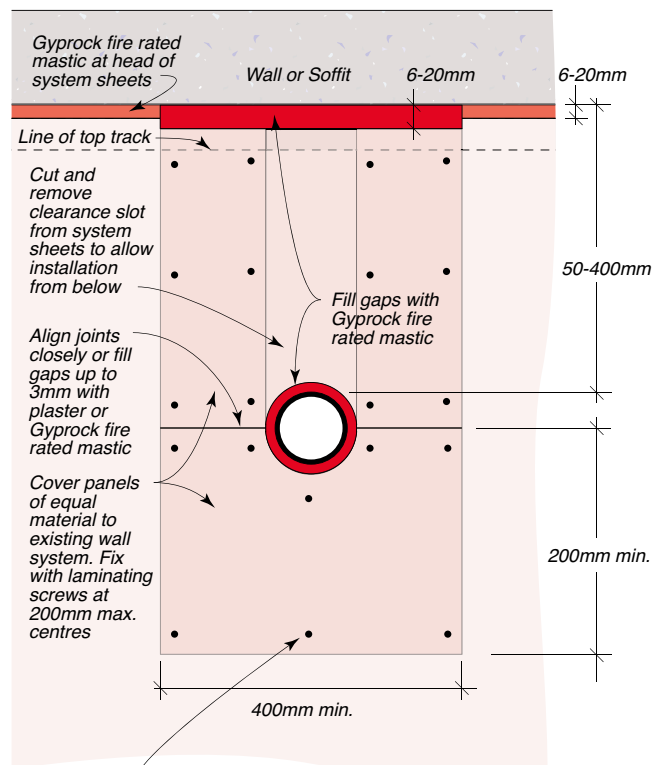


Figure 136: Penetration Detail – 200mm Ø Metal Pipe  
50 to 400mm from Wall/Soffit Junction  
(Up to -/120/-) Appraisal: FCO 3050.



Penetrations in Steel Framed Walls – Cables – Fire Rated

Appraisal as noted.

Figure 137: Cabling Penetration

Up to FRL -/90/- . Appraisal: FCO 3050.

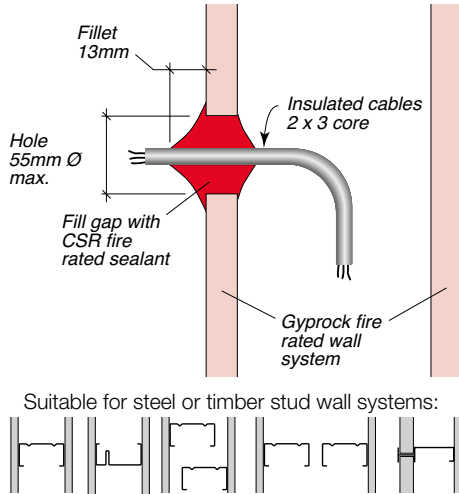


Figure 139: Single Sided Cabling Penetration

Up to FRL -/90/90. Appraisal: FCO 3050.

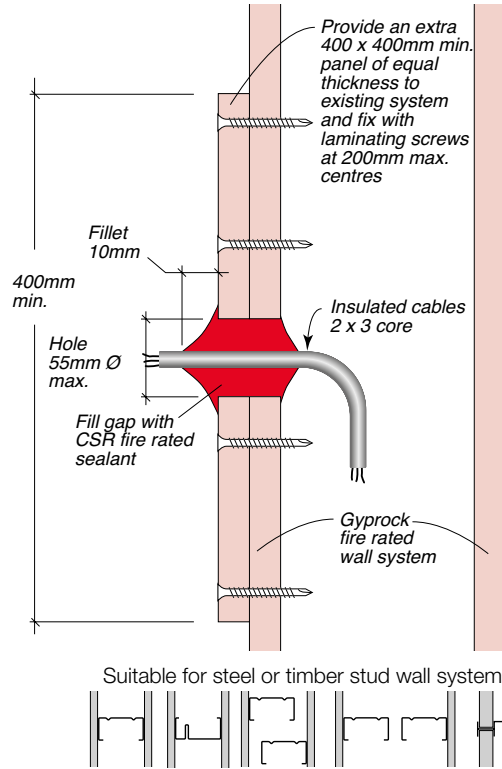


Figure 138: Single Sided Cabling Penetration

Up to FRL -/120/120 and 120/120/120. Appraisal: FCO 3050.

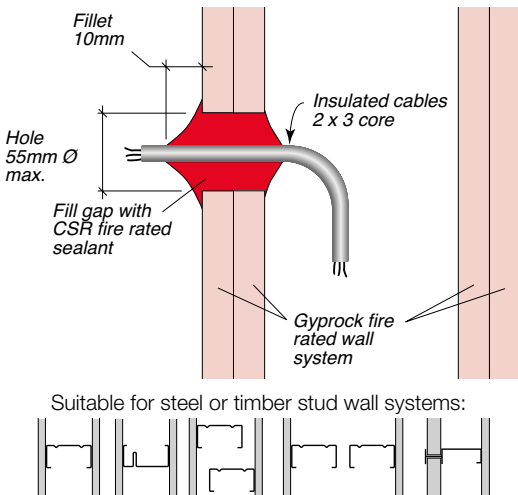
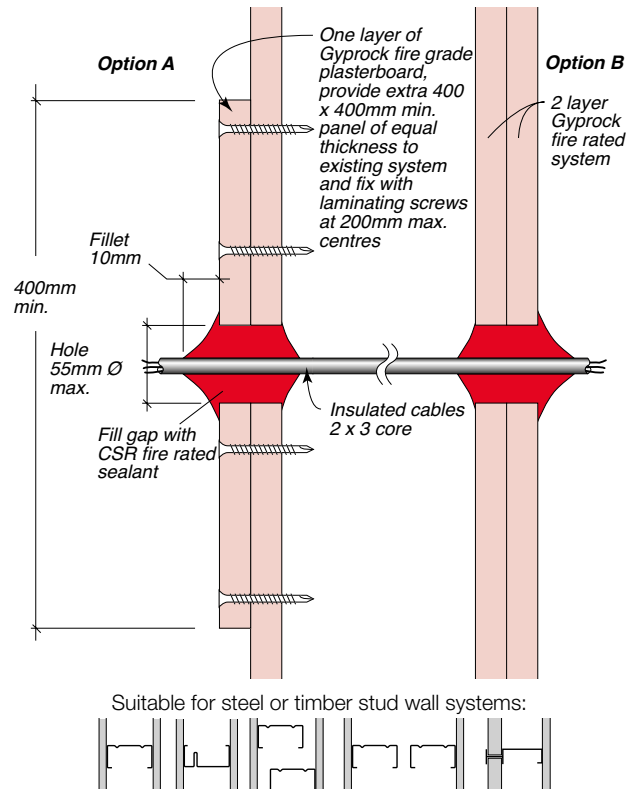


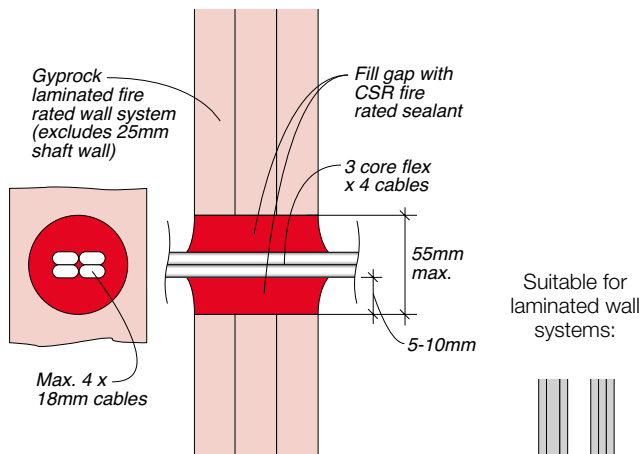
Figure 140: Through Wall Cabling Penetration

Option A – FRL up to -/90/- . Appraisal: FCO 3050.  
Option B – FRL up to -/120/120. Appraisal: FCO 3050.



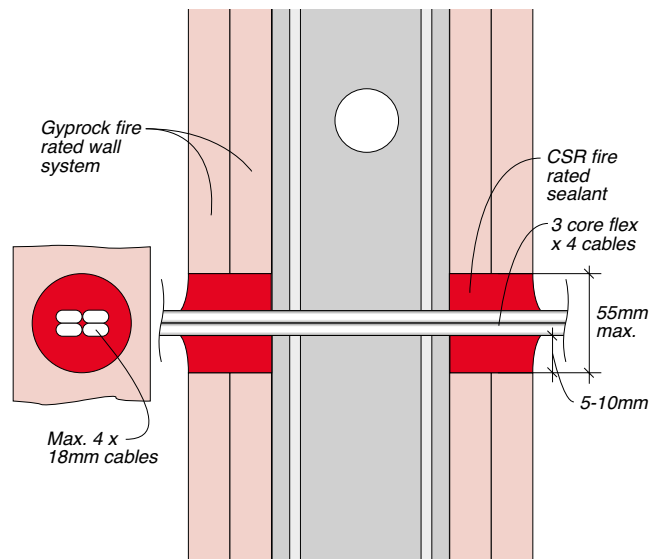
**Figure 141: Cable Penetration**

PVC sheathed Cables up to 3 cores of 2.5mm<sup>2</sup> nom. area or 7 x 0.67 metric strand  
Up to FRL -/120/- Appraisal: FCO 3198.



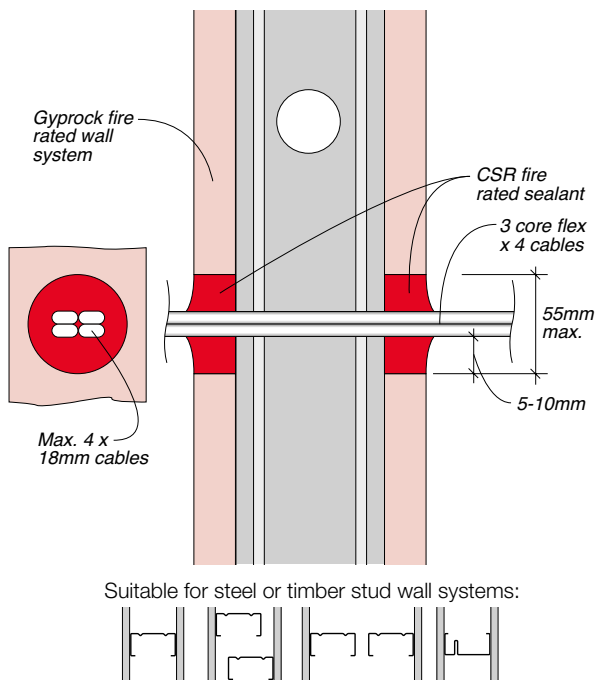
**Figure 143: Cable Penetration**

PVC sheathed cables up to 3 cores of 2.5mm<sup>2</sup> nom. area or 7 x 0.67 metric strand  
Up to FRL -/120/- Appraisal: FCO 3198.



**Figure 142: Cable Penetration**

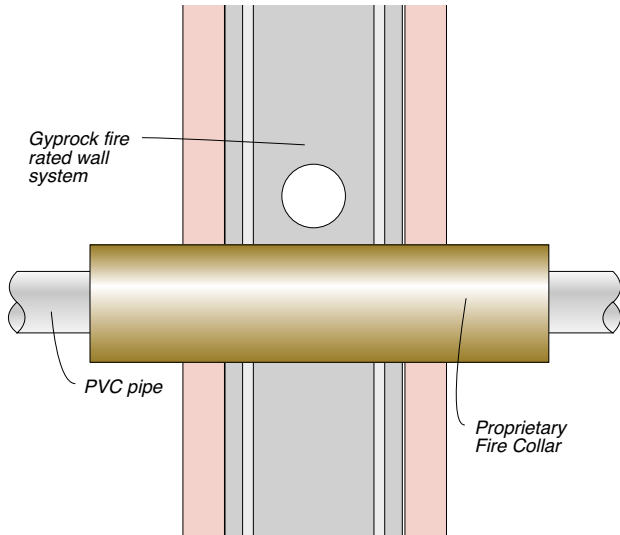
PVC sheathed cables up to 3 cores of 2.5mm<sup>2</sup> nom. area or 7 x 0.67 metric strand  
Up to FRL -/90/- Appraisal: FCO 3198.



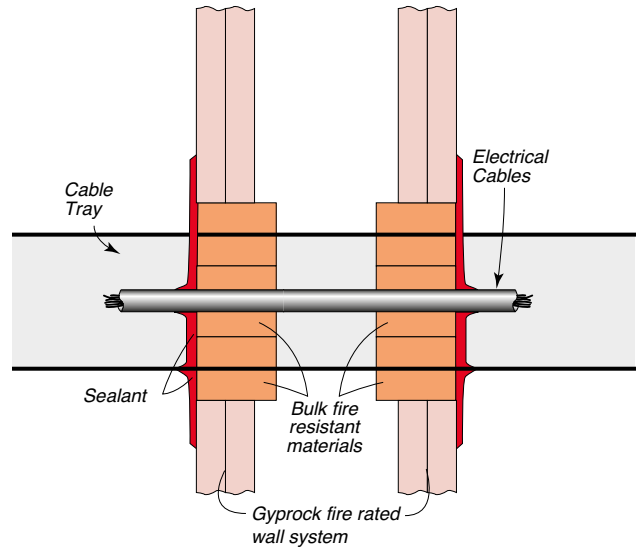
**Penetrations In Steel Framed Walls – Proprietary Systems**

Details Figure 144 to Figure 148 contain proprietary components and are not subject to appraisals by CSR. For specifications, installation details, and fire performance, refer to the appropriate component supplier.

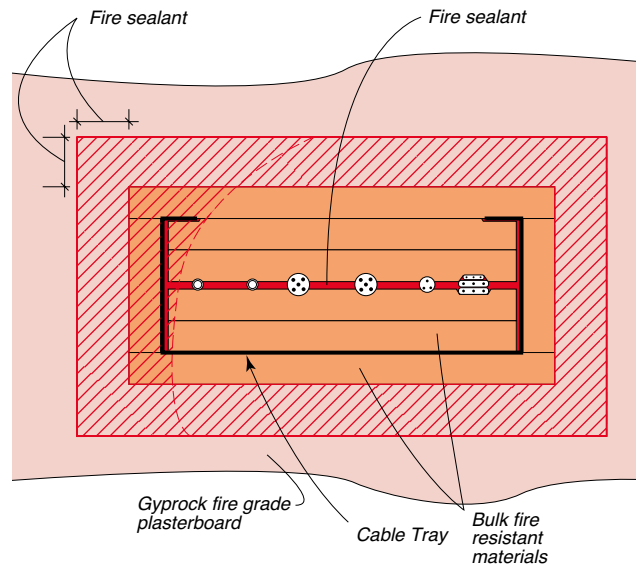
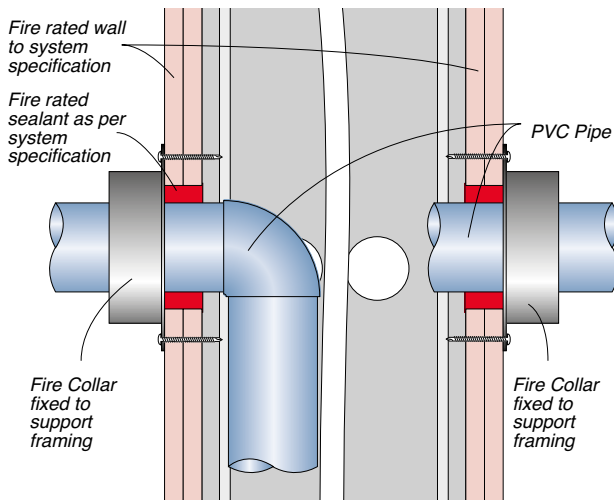
**Figure 144: Typical PVC Pipe Penetration**



**Figure 146: Typical Cable Tray Installation**



**Figure 145: Typical PVC Pipe Fire Collar**





## Fire Dampers

Refer to damper supplier for installation details and performance.

Figure 147: Typical Detail For Mechanical Fire Damper

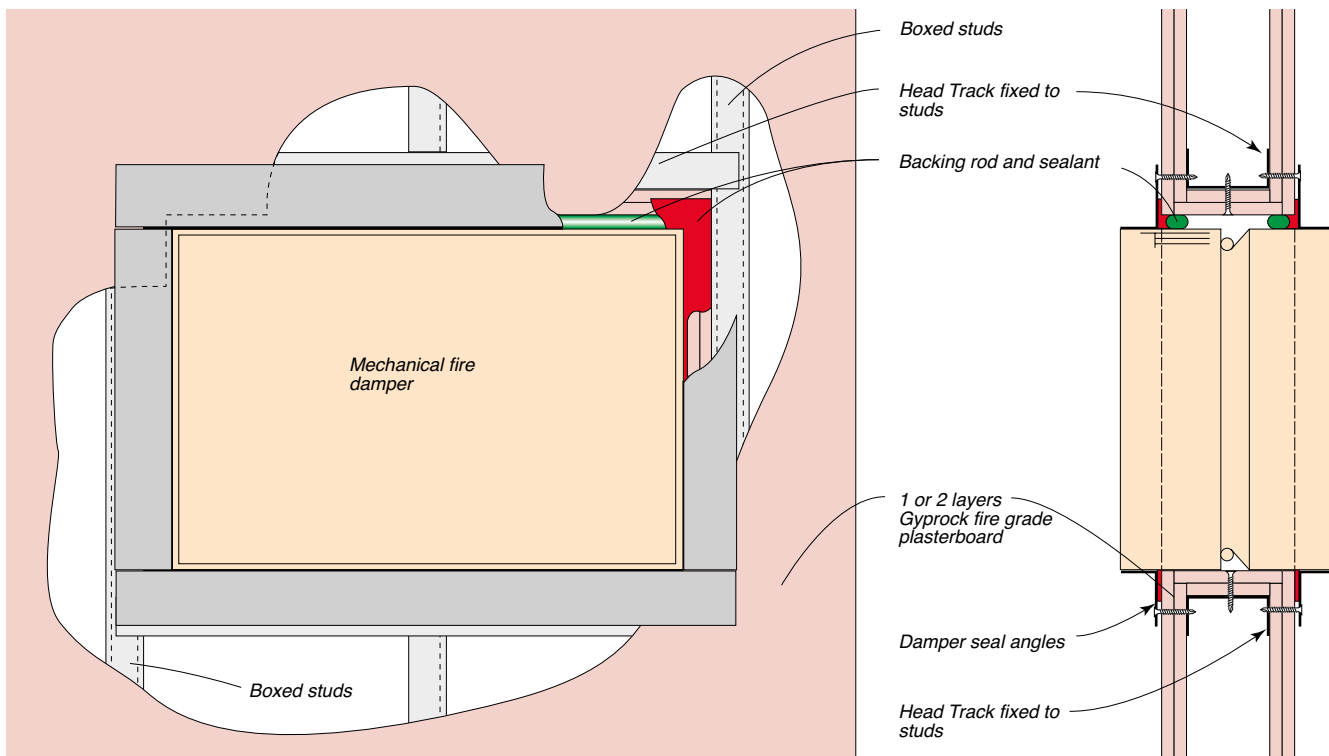
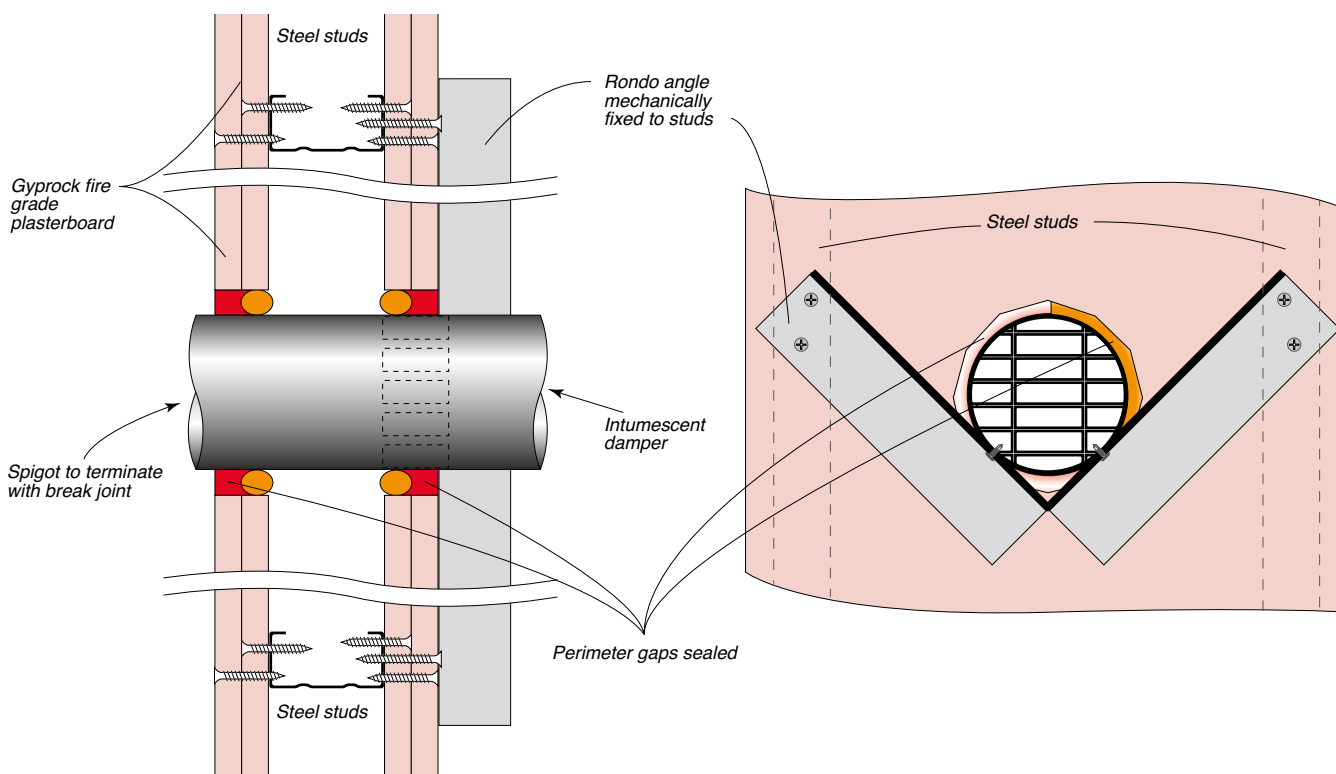


Figure 148: Typical Detail For Intumescent Fire Damper



# Gyprock Silencer F

The patented Gyprock Silencer F has been developed for use in Gyprock walls to provide fire and acoustic ratings for various penetrations. For use with steel framed stud walls, StrataWall and Security Wall, it can maintain fire rating up to  $-/120/120$  FRL and maintain the system acoustic ratings. Taps, pipes, power outlets, light switches and similar penetrations can be installed in the silencer.

The Gyprock Silencer F consists of a metal top hat profile, installed horizontally between studs and screw-fixed using steel angles, or vertically between tracks using screws and clips. The natural shape of the Silencer F provides an additional layer of protection to penetrations made through the plasterboard liner and into the cavity, protecting the cavity from potential direct exposure to the fire-source. Fire resistance testing was carried out at the CSR Research Laboratory, with standard power outlets and taps positioned back to back within Gyprock Silencer F profiles, and the details are included in Exova assessment EWFA 31941100. The details are also the subject of an acoustic assessment by PKA Associates.

Installation guidance must be closely adhered to, in order to maintain the FRL of the wall system in which they are installed. The following details are intended to show some examples of where the Gyprock Silencer F can be used and its installation.

## Advantages

- As an alternative to fire and acoustic rated power boxes, standard power points can be installed in Gyprock fire grade plasterboard systems using the Gyprock Silencer F. This reduces the labour intensive cutting and caulking requirements of many other systems.
- Additional non-fire rated wall cavities in front of Gyprock fire grade plasterboard wall systems are no longer required, the Gyprock Silencer F provides fire solutions for metal tap penetrations including brass mixer taps.
- Provides support for services, removing the need for ply in fire walls.
- Maintains up to  $R_w+C_{tr}$  50 in double stud wall systems.
- Maintains up to  $R_w$  50 in quite stud and staggered stud walls systems.
- Provides acoustic separation for water supply pipes contained in the Gyprock Silencer F up to  $R_w+C_{tr}$  40 to the adjacent sole-occupancy unit.

## Acoustic Performance

Acoustic performance of penetrations for GPOS, switches, pipes, cables, etc. protected by the Gyprock Silencer F are subject to an acoustic assessment by PKA Associates (PKA-A126).

## Sound Transmission

Gyprock Silencer F can be used to maintain the acoustic performance of pipes and GPO penetrations in corridor walls and intertenancy walls up to  $R_w50$  and  $R_w+C_{tr}$  50 when the details in this guide are followed.

## Plumbing Services

Water supply and waste water services generate noise in all wall cavities. Water supply noise is generated by turbulence and the formation of vapour bubbles at fittings and taps (known as cavitation). It is also generated by pressure variations within the pipe, due to sudden changes in water flow (known as water hammer). These forms of noise are transmitted almost entirely by structure borne vibration.

Waste water noise is generated by the flow of water in the pipes and is almost entirely airborne noise. For systems addressing waste water noise, refer to The Red book fire, acoustic and thermal design guide GYP500.

Water hammer in water supply pipes can be controlled or eliminated with proprietary water hammer arrestors. These are fitted to the pipe network and act as a shock absorber for the pressure variations in the pipe. For water hammer generated by mixer taps, manufacturers such as Novelli have mixer taps with slow close dampers, which prevent the taps from being shut quickly, thus eliminating them as a source of water hammer.

When water supply services are installed within the Gyprock Silencer F, any cavitation and water hammer noise is reduced by isolating the noise source from the linings on the other side of the wall. The airborne noise that may leak into the silencer cavity around taps is also contained.

Noise generated by taps and fittings may be further reduced by using the following measures:

- Pressure reducing valves are usually fixed at 350kPa, but do not restrict the water flow. They are ideal in areas that have high water pressures, and reduce the severity of water hammer and tap noise.
- Flow control shower heads have a reduced flow rate, and thus produce less noise. Typical flow rates for standard showers can be 20-35 litres/minute. Flow control shower heads are commonly available in 6, 9 and 12 litres per minute output.
- Flow control washers are simple plastic discs that can be fitted between the supply pipe and any shower, or tap fitting. They have a small opening which in turn reduces the water flow, and are available 6, 9 and 12 litres per minute flow rates.

### Acoustic Requirements

- Minimum 50mm thickness and 11kg/m<sup>3</sup> density insulation must be installed throughout the wall cavity
- Cut-outs collectively not to exceed 5% of total wall area
- All service penetrations in the lining must be in neat, close-cut holes
- Silencer F can be installed horizontally fitted between studs so that the studs terminate the open silencer ends.
- Silencer F may be fitted vertically, extending at least 300mm beyond cut-outs and terminating at a steel member
- Minimum clearance from back of silencer to lining must be 30mm to allow for 50mm insulation to fit throughout the cavity
- Minimum clearance between adjacent Silencers on opposite sides of the wall to be 300mm
- Service penetrations to surrounding framing must have a maximum diameter of 25mm and be sealed.
- Services penetrations in the ceiling space do not require to be acoustically sealed

### Fire Resistance

The Fire Resistance of the wall penetrations detailed in this section have been evaluated for up to FRL –/120/120 in Exova Warrington Fire Assessment report EWFA 31941100. The fire resistance performance of penetrations in Gyprock fire grade plasterboard wall systems are provided in Table 28. To achieve the stated performance, the Gyprock Silencer F and penetrations contained within must be installed in accordance with this guide.

The stated FRL results for plumbing services in this guide require a copper pipe plumbing system.

### Applications

- Bathrooms
- Laundries
- Kitchens
- Balcony/outdoor kitchens.

Table 28: Gyprock Silencer F – Supplementary FRL Information (Double Stud Wall)

Lining Type	Original system Performance	Pipe Penetrations		GPO Penetrations	
		Single Silencer F Application	Back-to-Back Silencer F Application	Single Silencer F Application	Back-to-Back Silencer F Application
1 x 13mm Gyprock fire grade plasterboard each side	–/60/60 30/30/30* 60/60/60* *ACR 15%	Up to FRL –/60/60	Up to FRL –/60/60†	Up to FRL –/60/60	
2 x 13mm Gyprock fire grade plasterboard each side	–/120/120 90/90/90* 120/120/120* *ACR 10%	Up to FRL –/120/120	Up to FRL –/120/90 –/120/120^	Up to FRL –/120/120	
2 x 13mm Gyprock fire grade plasterboard side one + 1 x 13mm Gyprock fire grade plasterboard side two	–/90/90 30/30/30	Up to FRL –/90/60	Up to FRL –/90/60	Up to FRL –/90/90	
1 x 16mm Gyprock fire grade plasterboard each side	–/90/90 60/60/60* 90/90/90* *ACR 15%	Up to FRL –/90/90	Up to FRL –/90/90†	Up to FRL –/90/90	
2 x 16mm Gyprock fire grade plasterboard each side	–/120/120 90/90/90* 120/120/120* *ACR 10%	Up to FRL –/120/120	Up to FRL –/120/90 –/120/120^	Up to FRL –/120/120	

^ Gyprock plasterboard lining required to be fitted to back of Silencer F - in 10mm thickness

† Gyprock fire grade plasterboard lining required to be fitted to back to back Silencer F - in same thickness as lining system

Figure 149: Typical Applications for Gyprock Silencer F – Laundry

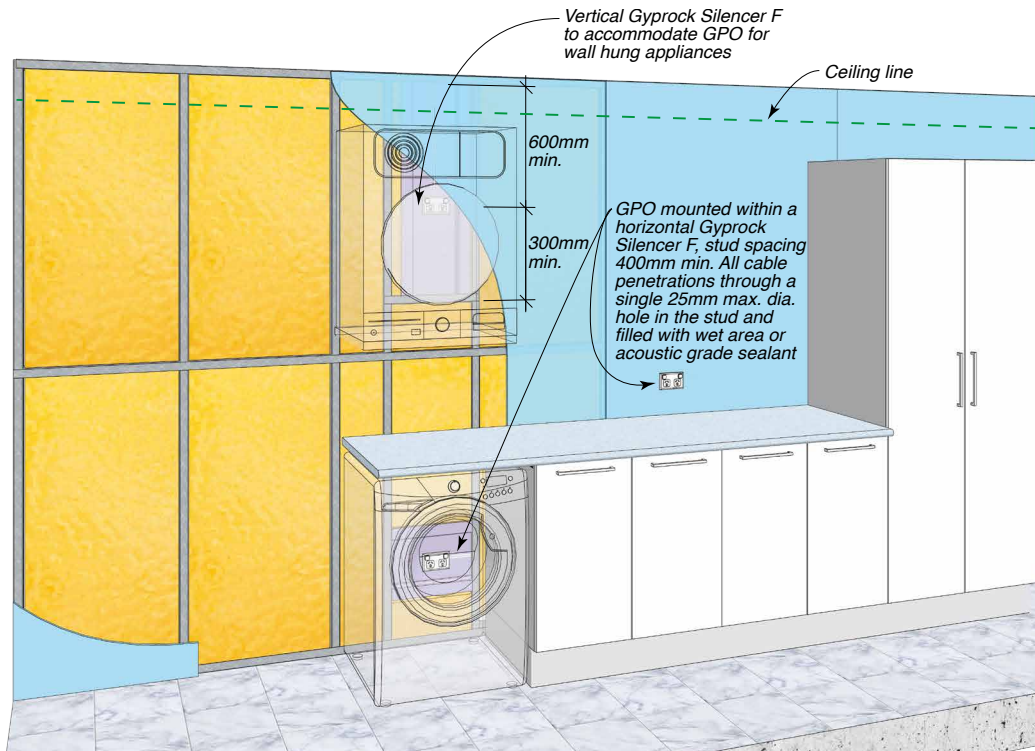


Figure 150: Typical Applications for Gyprock Silencer F – Bathroom

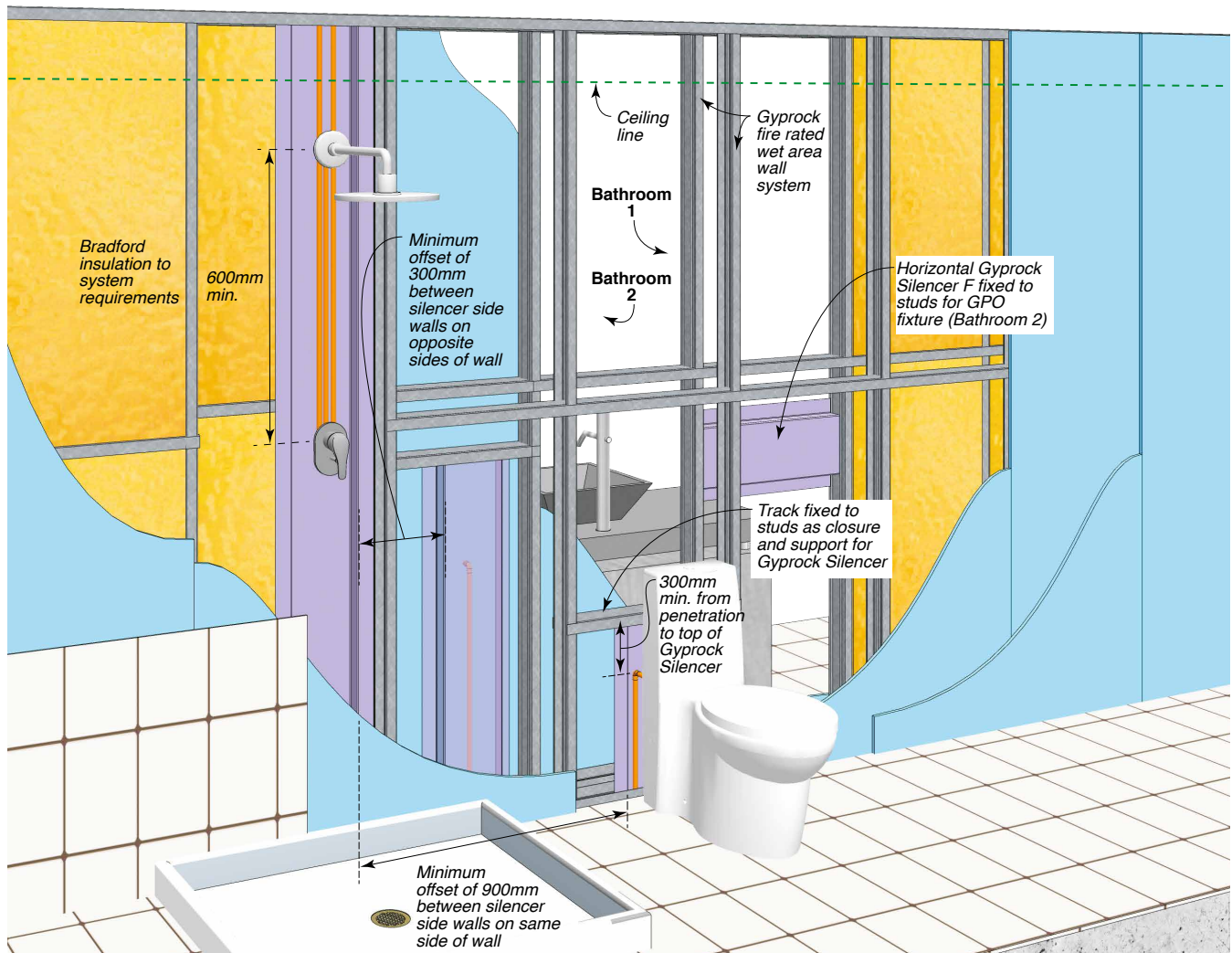


Figure 151: Gyprock Silencer F – Vertical Installation

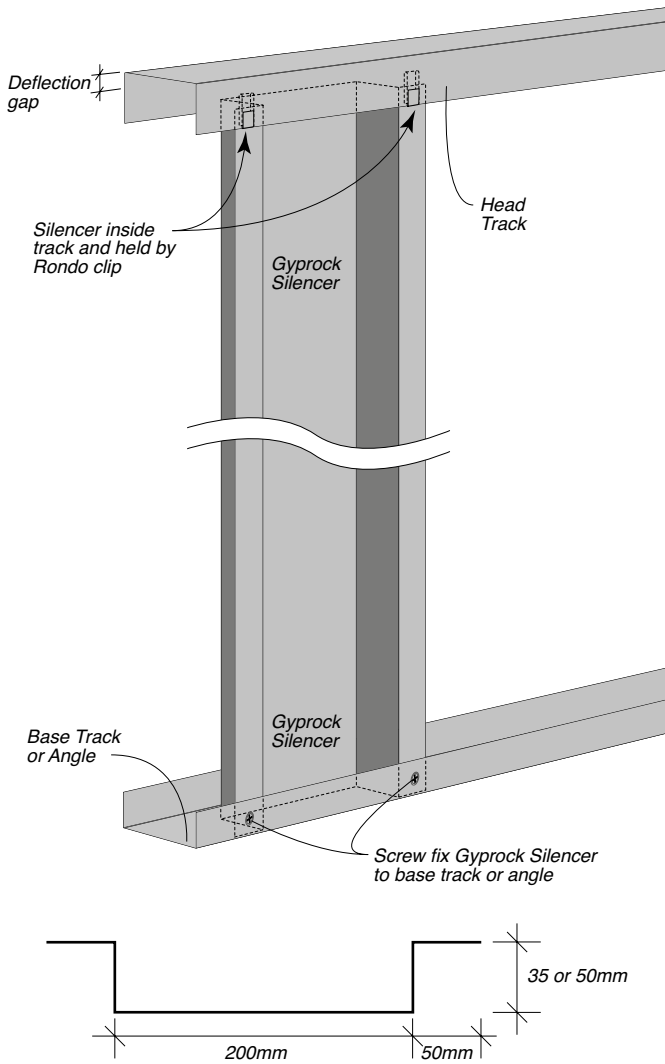


Figure 152: Typical Plumbing Services Installation With Vertical Gyprock Silencer  
Up to FRL –/120/120.

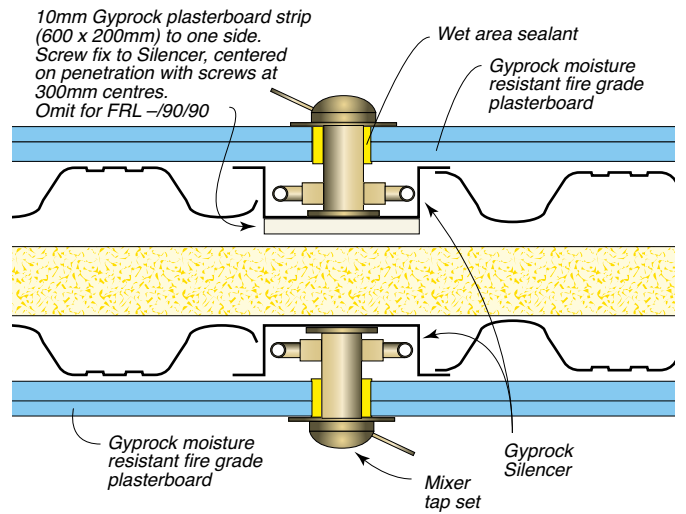


Figure 153: Plumbing Services In Stud Wall One Side With Vertical Gyprock Silencer  
Up to FRL –/120/120.

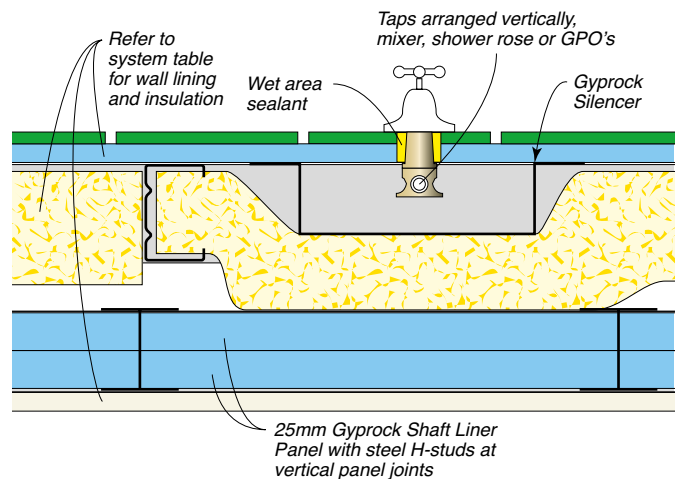


Figure 154: Typical Electrical Services Installation With Vertical Gyprock Silencer – 2 Layer

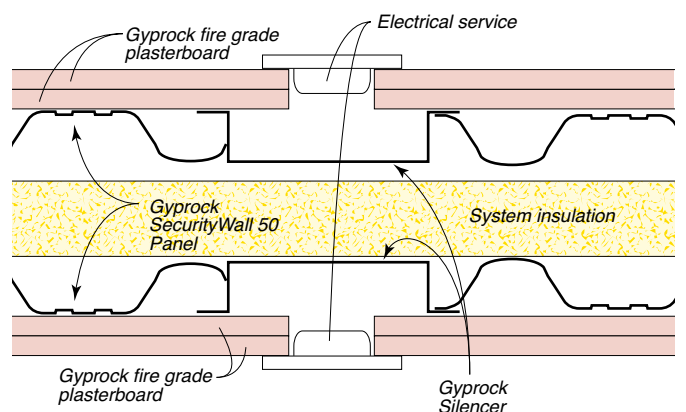




Figure 155: Vertical Gyprock Silencer F With Typical GPO Penetration – Fire Rated

Refer to Table 28. Acoustic performance maintained. PKA-A126

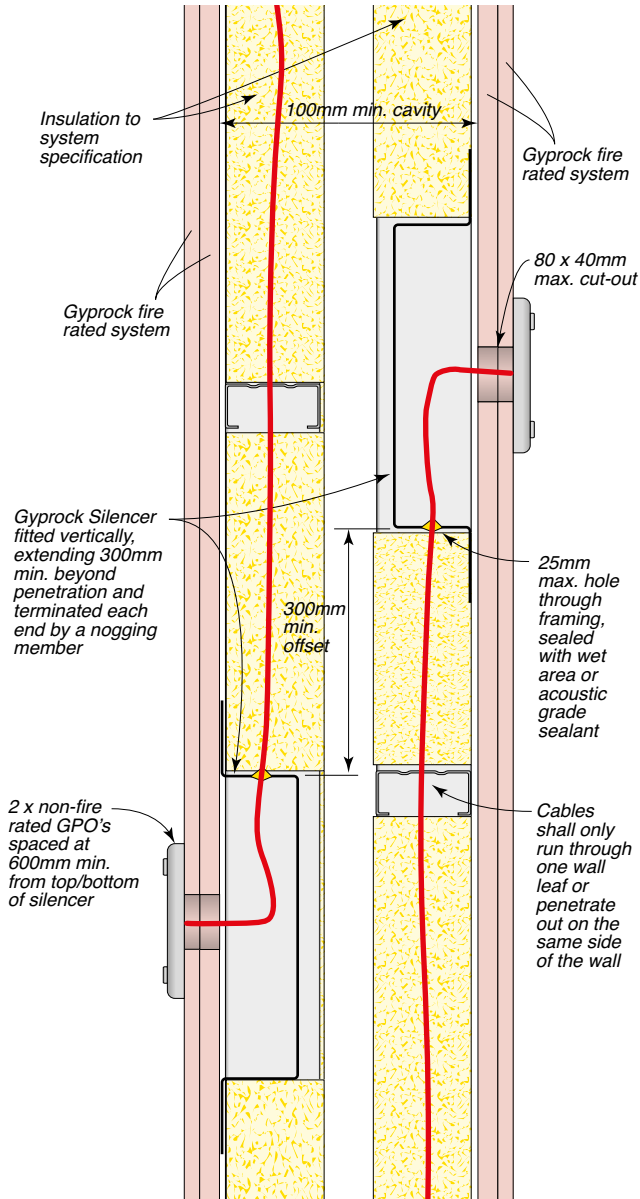


Figure 156: Gyprock Silencer F – Horizontal Installation

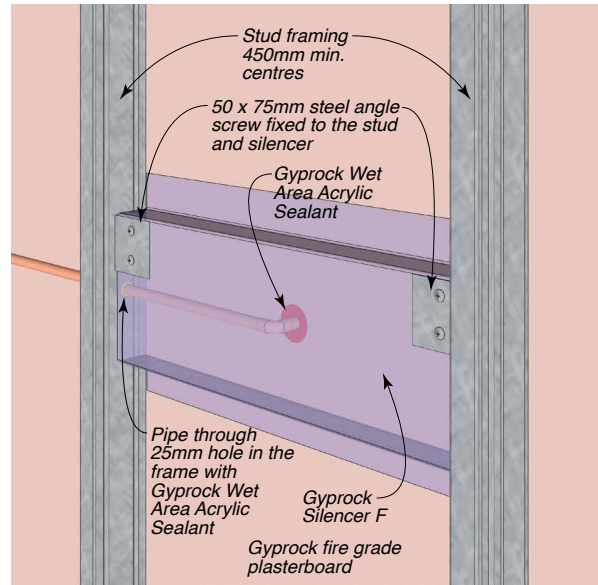
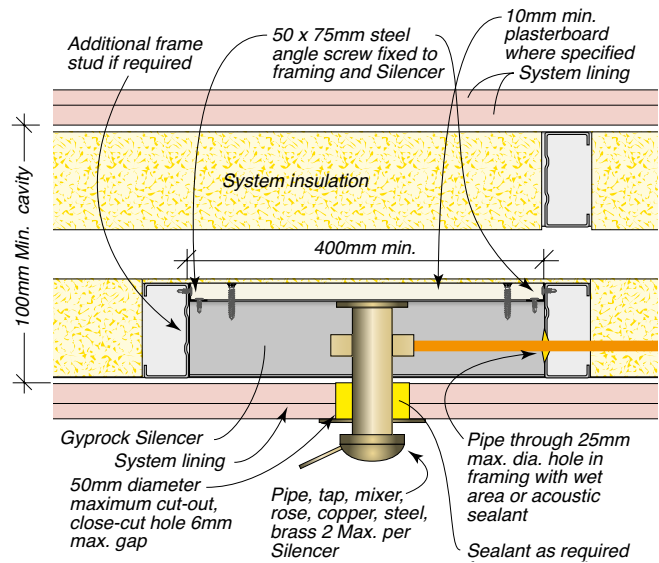


Figure 157: Horizontal Gyprock Silencer With Typical Pipe Penetration Installation – Fire Rated

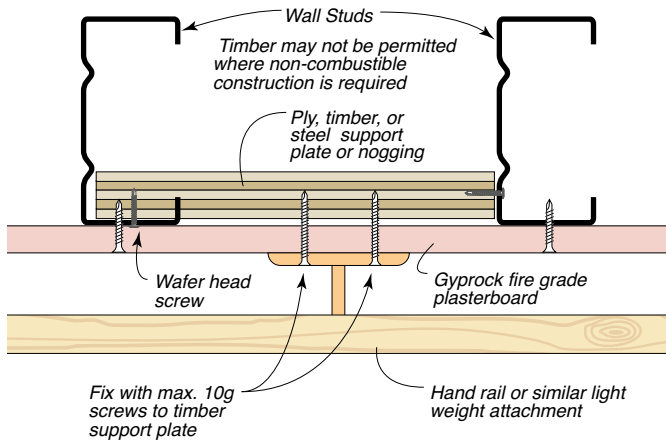
Refer to Table 28. Acoustic performance maintained. PKA-A126



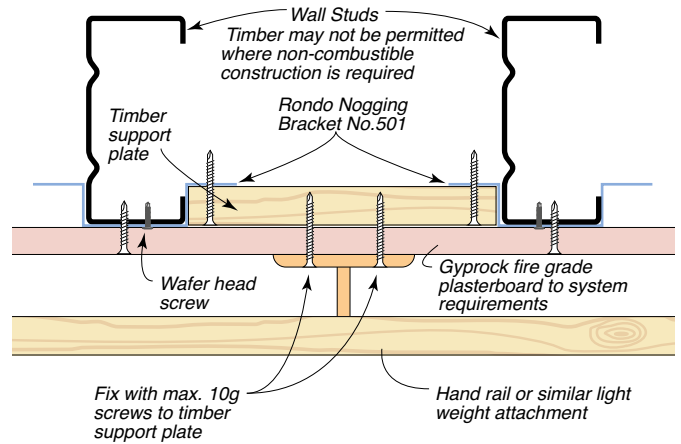


### Attachments & Access Panels

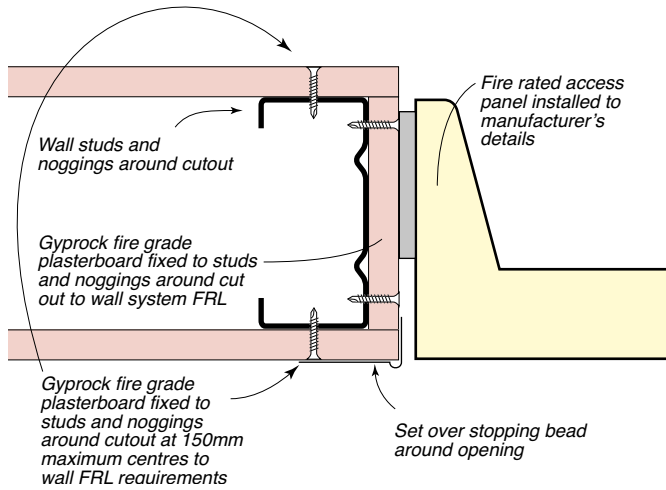
**Figure 158: Light Weight Fixture Attachment – Handrails, Basins & Signs**  
Maintains the system FRL. Appraisal: FC 12946.



**Figure 160: Light Weight Fixture Attachment – Handrails, Basins & Signs – Alternative Method**  
Maintains the system FRL. Appraisal: FC 12946.



**Figure 159: Typical Access Panel In Wall**  
Appraisal: Refer to manufacturer.



## NOTES

# Column & Beam Encasement Systems

## Introduction

CSR Gyprock has developed a series of encasement systems which provide up to 120 minutes fire resistance for structural steel and concrete columns and beams.

## Description

### Plasterboard Encasement Systems

These systems utilise a range of Gyprock fire grade plasterboard together with appropriate caulking and jointing to achieve the desired fire resistance.

### Glasroc F Frameless Encasement

These systems utilise the Gyprock Glasroc F board. The encasement system allows for a reduction in framing elements as boards are fixed at corners directly to adjacent boards. This also reduces the need for caulking or jointing to achieve fire resistance. The system provides protection to universal steel columns and beams, together with many other structural steel types.

## Advantages

### Plasterboard Encasement Systems

- Provides a high quality finish when compared with intumescent paint solutions.
- Uses standard Gyprock fire grade plasterboard with conventional fixing methods and compounds
- Can be integrated into surrounding Gyprock lined walls, ceilings & bulkheads.
- Easy to inspect for continuity, giving greater peace of mind both immediately after installation and during maintenance inspections.

### Glasroc F Frameless Encasement

- Provides durable lining to structural steel, and offers 120 minutes fire protection in one layer.
- It can be used in any type of building where a fire rated encasement is required to structural steelwork.
- Reduced installation time as Glasroc F boards can be screw fixed to one another without the need for other components.
- Framing system that minimises the space needed to provide fire protection to structural steel
- No requirement to seal/joint or apply a decorative treatment for gaps less than 3mm.
- The moisture resistance capability of the Glasroc F board means that installation of the system can commence before the building envelope is fully weather tight.

## Components

### Fire Grade Plasterboard

Gyprock manufactures and supplies a diverse range of fire grade plasterboard. Refer to Table 1.

### Glasroc F

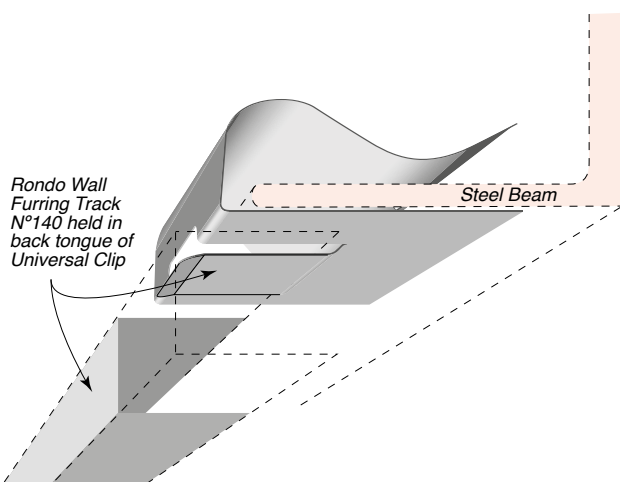
Glasroc F is a 30mm thick, high density plasterboard. It is paperless, has square edges, and is available in 1200 x 2000mm panels. Refer to Table 1.

### Universal Encasement Clip

The Gyprock Universal Encasement Clip is designed for use with plasterboard encasement systems. It is manufactured from 1mm galvanised steel, and has been designed to suit common steel flange thicknesses between 6 and 28mm.

The clip slides onto the steel beam flange and holds in place via integral punched grips. Rondo #140 Wall Track is held in the back tongue to form framework for plasterboard fixing.

Figure 161: Gyprock Universal Encasement Clip



### Gyprock Glasroc F Screws

The Gyprock Glasroc F system requires the use of specialised fixings designed to screw into the Gyprock Glasroc F boards. The fixings self countersink and maintain the fire rating of the system. They are a 40mm or 70mm countersunk Phillips head screw with a specialised thread.

### Rondo Steel Angle

Rondo 552 angles are required primarily for three sided encasement systems. The angles are 0.7mm BMT steel section.

### Caulking

To attain the specified FRL, all perimeter gaps and penetrations must be carefully filled to the specified depth with Gyprock Fire Mastic or CSR FireSeal.

### Cavity filling

Voids formed between linings and the column profile may require filling to a height of 1.2m to meet BCA lightweight construction requirements. Suitable filling materials are plasterboard strips and set plaster mixtures.

If plaster is used, the linings must be adequately supported until the plaster sets. Protection from damage by vehicles may also be required.

# Plasterboard Encasement Systems

## Steel Column Encasement Systems

Appraisal: FCO 1494

### Framing

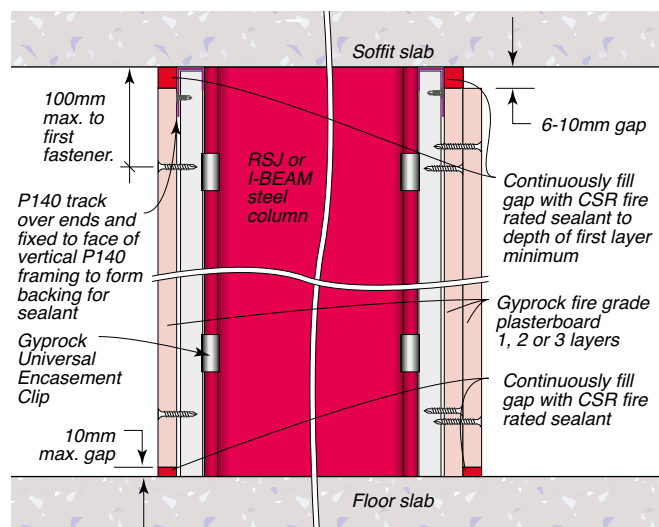
Metal angle must be fixed to the base and soffit or ceiling framing at 600mm maximum centres and at 100mm maximum from each end, and aligned to provide a framework for plasterboard fixing.

Gyprock Universal Encasement Clips are friction fitted to the remaining column flanges at 800mm maximum centres and 150mm maximum from each end of the steel column.

Wall Furring Track (Rondo N°140) is held in the back tongue of the clip to form a steel framework for plasterboard attachment. Refer to Figure 162 and Figure 163.

Rondo N°140 track is used in other locations to form noggings and backing for sealant.

Figure 163: Head/Base Detail – Fixed To Furring



### Plasterboard Fixing

Where the width of plasterboard sheet is greater than 600mm, additional noggging support must be installed at 600mm maximum centres along the column.

Cut flanges of (N°140) track appropriately to form noggging and screw fix each end to the adjacent longitudinal tracks.

Gyprock fire grade plasterboard must be screw fixed to all furring and noggging track at 200mm maximum horizontal and vertical centres.

Fix subsequent layer(s) of plasterboard to the same specifications. Ensure plasterboard layers provide a zig-zag joint at all corners.

Provide a 6-10mm gap between sheet ends and abutting walls/ceilings/floors.

Butt joints in consecutive layers of plasterboard must be staggered a minimum of 300mm. Fix each layer to the adjacent layer along all butt joint edges using Gyprock Laminating Screws at 200mm maximum centres.

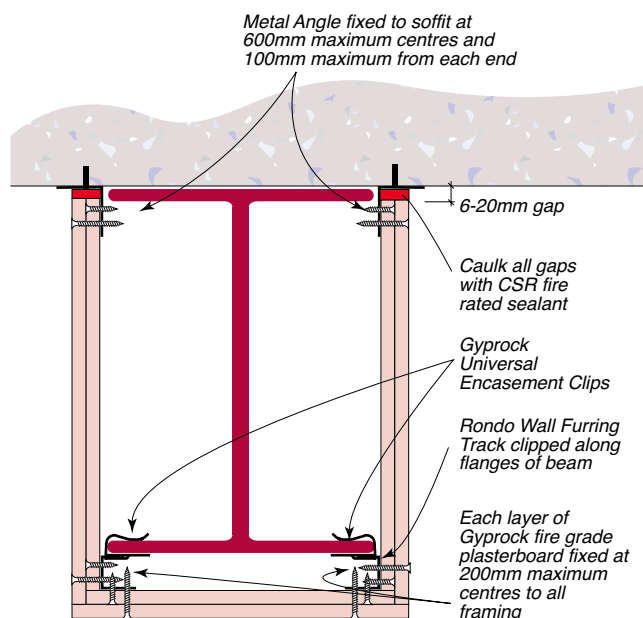
### Caulking

All gaps at head, base and at junctions with other structures must be filled with CSR fire rated sealant to the depth of the first layer minimum. Refer to Figure 162, Figure 163 and Figure 164

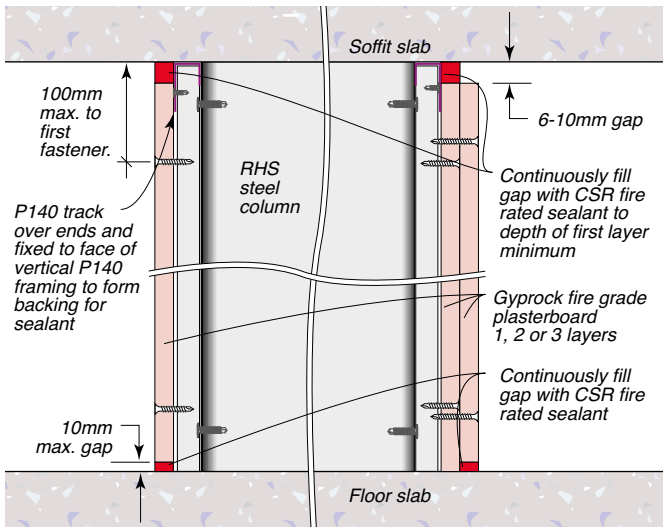
### Finishing

Fix External Angle Bead and set all external angles. Set all internal angles. Refer to the Jointing & Finishing section of this guide.

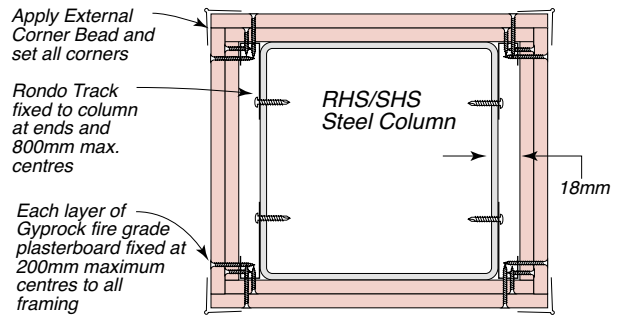
Figure 162: Column To Wall Junction – Plan View



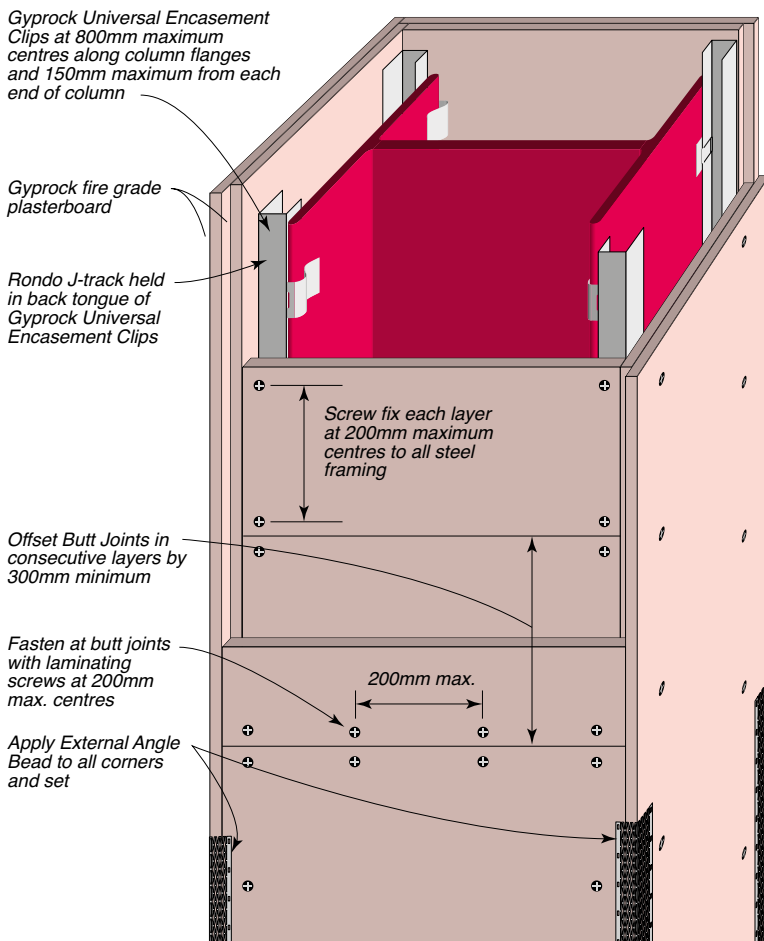
**Figure 164: Head/Base Detail – Fixed To RHS/SHS**



**Figure 165: Fixing To Steel Hollow Section (RHS/SHS)**



**Figure 166: Plasterboard Fixing To Steel Universal Section Column**





## Steel Beam Encasement Systems

### Framing

Metal angle must be fixed to the soffit or ceiling framing at 600mm maximum centres and at 100mm maximum from each end, and aligned to provide a framework for plasterboard fixing.

Gyprock Universal Encasement Clips are friction fitted to the remaining column/beam flanges at 800mm maximum centres and 150mm maximum from each end of the steel column/beam.

Wall Furring Track (Rondo N°140) is held in the back tongue of the clip to form a steel framework for plasterboard attachment.

Track must be installed at each end of the column/beam (and behind plasterboard butt joints in single layer systems) to enable plasterboard fixing.

Where the width of plasterboard sheet is greater than 600mm, additional nogging support must be installed at 600mm maximum centres along the beam.

Cut flanges of #140 Wall Track appropriately to form nogging and screw fix each end to the adjacent longitudinal tracks. Refer to Figure 167 to Figure 170.

### Plasterboard Fixing

Gyprock fire grade plasterboard must be screw fixed to all furring and nogging track at 200mm maximum horizontal and vertical centres.

Fix subsequent layer(s) of plasterboard to the same specifications. Ensure plasterboard layers provide a zig-zag corner joint at all corners.

Provide a 6-10mm gap between sheet ends and abutting walls/ceilings/floors and caulk with Gyprock Fire Mastic or CSR FireSeal.

Butt joints in consecutive layers of plasterboard must be staggered a minimum of 300mm. Fix each layer to the adjacent layer along all butt joint edges using Gyprock Laminating Screws at 200mm maximum centres.

Refer to Figure 167 to Figure 170.

### Caulking

To attain the specified FRL, all perimeter gaps and penetrations must be carefully filled to the specified depth with Gyprock Fire Mastic or CSR FireSeal.

### Finishing

Fix External Angle Bead and set all external angles. Set all internal angles. Refer to the Jointing & Finishing section of this guide.

Figure 167: Nogging Track Installation Detail

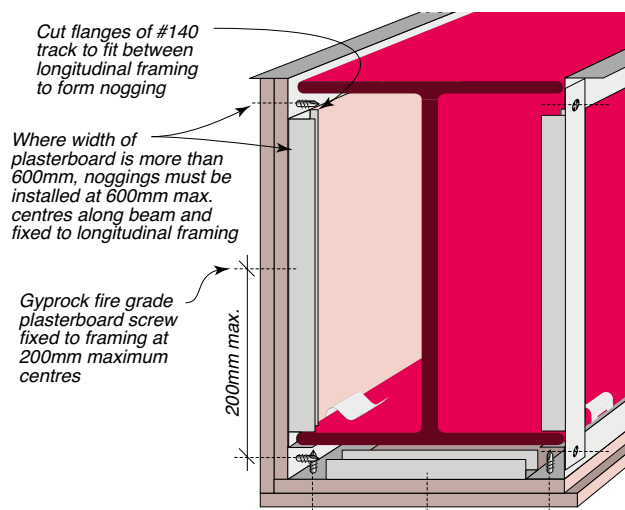


Figure 168: Beam/Wall Junction Detail

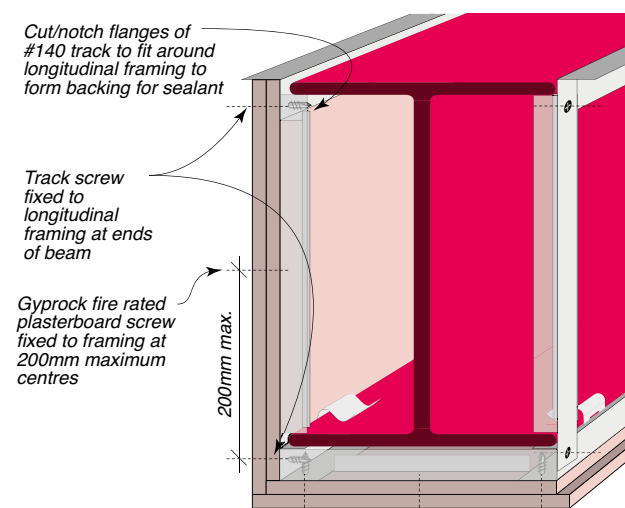


Figure 169: Junction Sealant Detail

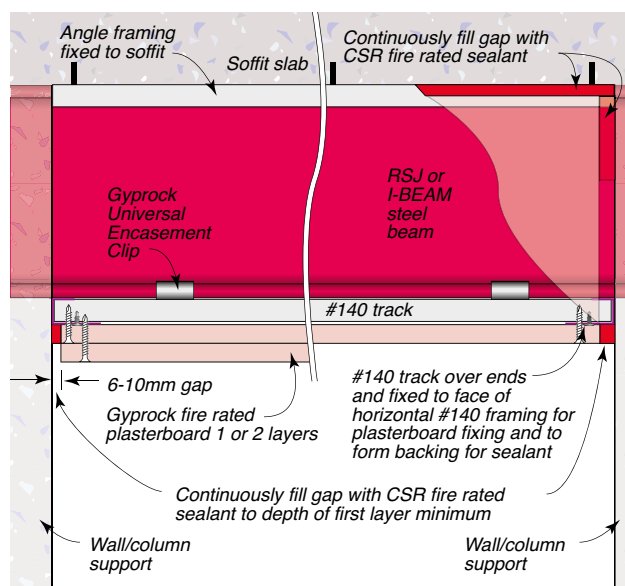
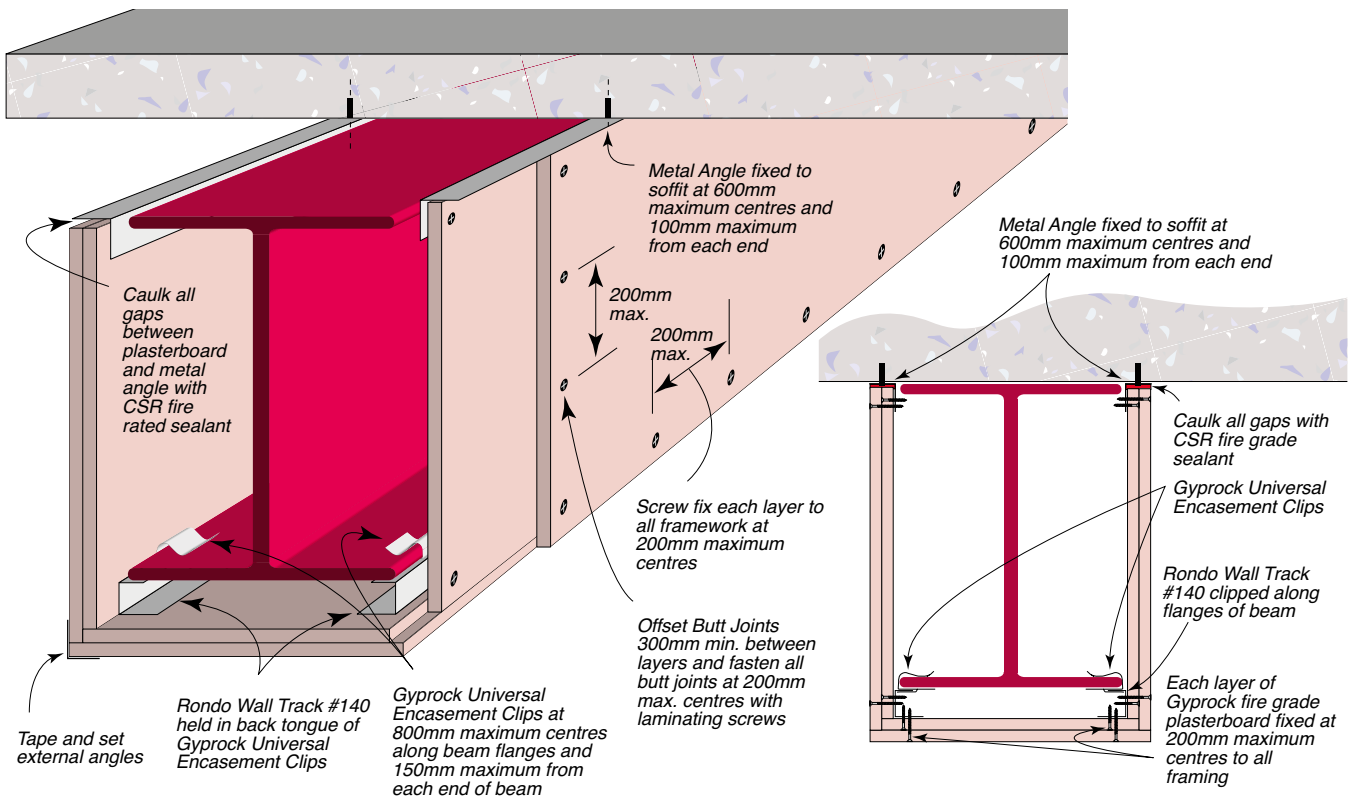


Figure 170: Steel Beam Encasement System – Fire Rated – Three Sided Plasterboard Fixing



Concrete Column Encasement Systems

Framing

- Fix Anchor Clip N°237 with metal fasteners at 100mm max. from each end and 1200mm max. vertical centres along column and at 600mm maximum horizontal centres. Fit Furring Channel N°308.
- Alternatively centre fix batten N°333 at 600mm max. centres.

Plasterboard Fixing

- Fix Gyprock fire grade plasterboard at 200mm maximum centres to all framing.
- Offset butt joints in consecutive layers by 300mm minimum.

Figure 171: Plasterboard Fixed To Steel Furring

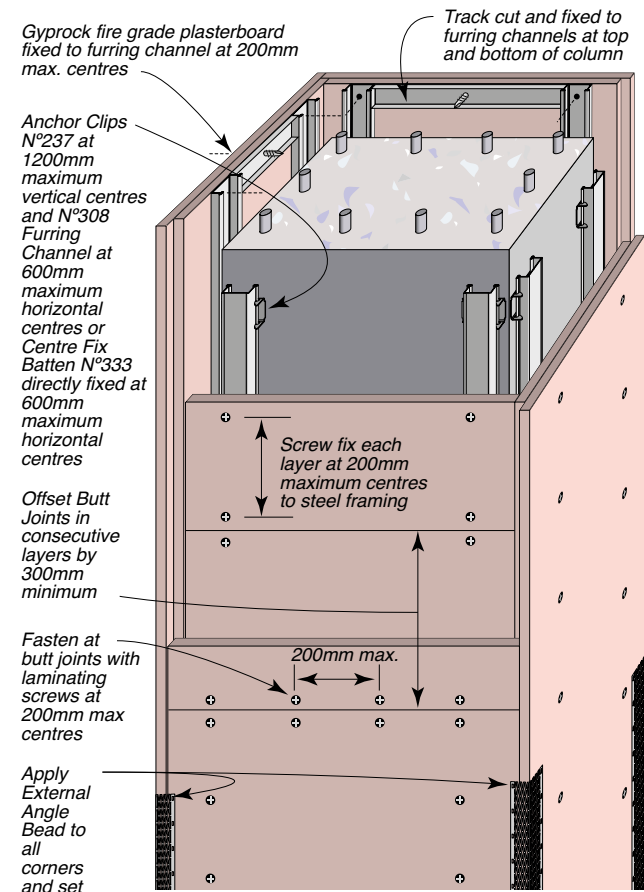


Figure 172: Head/Base Detail – Fixed To Furring

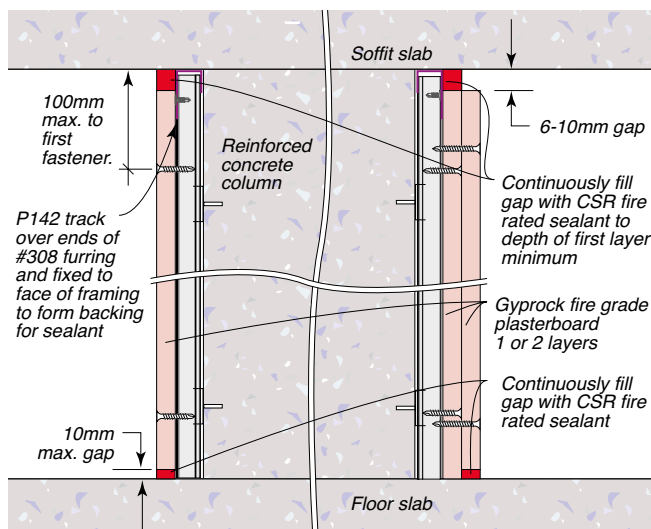
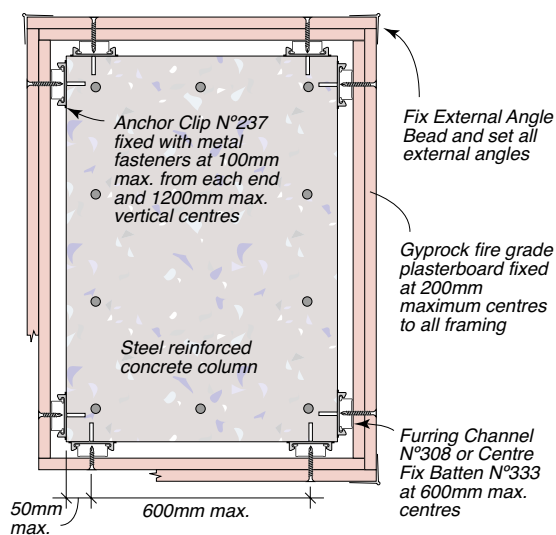


Figure 173: Plasterboard Fixed To Steel Furring



**Plasterboard Direct Fixed To Concrete**

Gyprock fire grade plasterboard may be direct fixed to a concrete column with Tapcon 10g screws (or equivalent) at 400 x 400mm max. horizontal and vertical centres.

Figure 174: Plasterboard Direct Fixed To Concrete

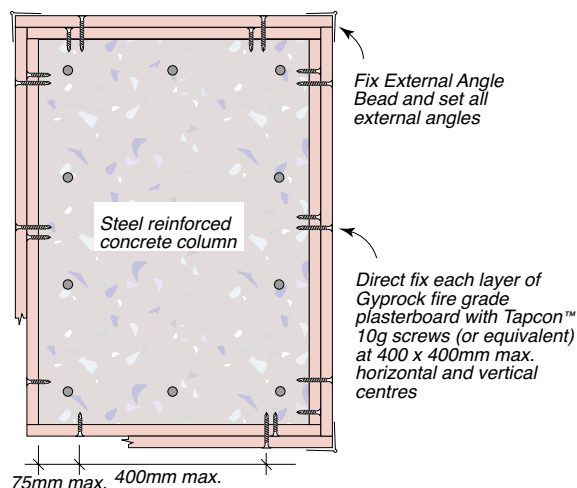
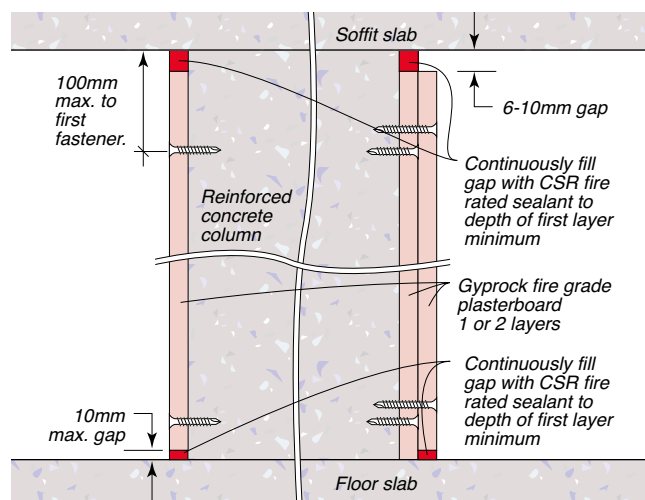


Figure 175: Head/Base Detail – Direct Fixed



# Glasroc F Encasement Systems

Appraisal: FAR 4876

## Design Considerations

Gyprock Glasroc F is a 30mm thick high-density fire grade plasterboard. It is used to provide fire protection by enclosing steel columns or beams on one or more sides. The fire protection is limited to the Structural Adequacy component of a Fire Resistance Level, expressed as 120/ – / – for example.

## Installation

Gyprock Glasroc F systems are available for the box encasement of I-beams, universal columns, channels, angles, and hollow sections. Details are provided for I-beams with 1, 3 and 4-sided protection, and may be adapted for 2-sided enclosure and for other steel profiles. Base plates and other attachments may be clad using similar methods.

Where steel section web dimensions exceed 600mm, the panels must be fixed to steel framing that is fixed to the flanges and installed at 600mm maximum centres.

Non-fire rated stud walls abutting columns may be fixed directly to the Gyprock Glasroc F board, or may be fixed to the structural steel section through the Gyprock Glasroc F board. Walls abutting beams must be fixed to the structural steel section through the Gyprock Glasroc F board.

## Finishing

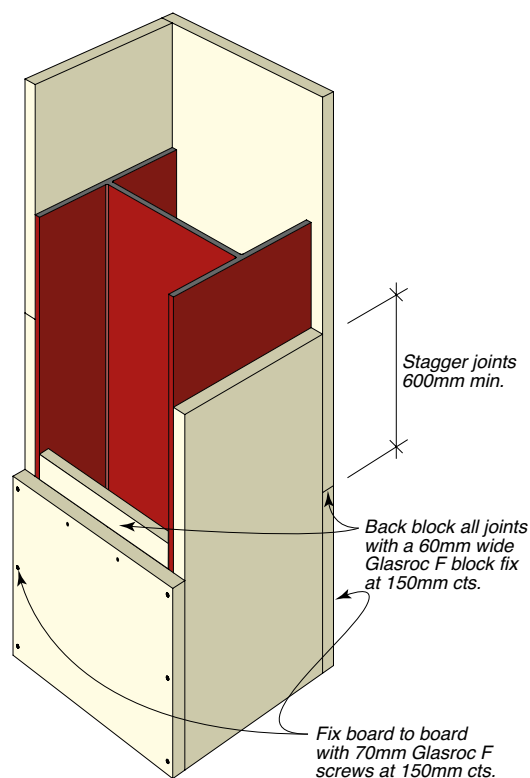
Setting of joints is not required to maintain fire rating, however if a level finish is required the system can be finished in accordance with the Jointing and Finishing section of this guide. Fire caulking is generally not required to maintain fire protection, however, gaps 3 mm to 6mm wide should be sealed with Gyprock Fire Mastic or CSR FireSeal.

## Installation For Four Sided Encasement

- Commence cladding from the base of the column through to the structural soffit. No additional framing is required as the sheets are fixed to each other.
- Cut two boards for opposite sides of the column and clamp in place. Start with short pieces to allow for staggered adjacent joints.
- Cut two boards for the other sides, allowing 60mm for the corner overlaps. Position the boards and screw fix board-to-board using the 70mm Glasroc F screw.
- Joints over cavities must be back blocked. Use a 60mm minimum width block for the length of the joint and screw fix at 150mm maximum centres.
- Continue with full length sheeting up the column maintaining a 600mm minimum offset of all adjacent joints. Trim the panels at the top of the column to ensure a tight fit against the soffit.

Note: All joints should be tight fitting to avoid the requirement for caulking. Caulk any gaps 3 to 6mm with CSR fire rated sealant.

Figure 176: Four Sided Encasement



## Installation For 3 Sided Column Encasement

### Column Flange Parallel To The Wall.

- Rondo steel angle is fixed to the column flange on both sides. Position the angle on the column edge such that the face of the angle section is level with the edge of the column flange. Secure using appropriate fixings (e.g. power nail) to the column at 600mm maximum centres. Refer to Figure 177
- Cut two boards for opposite sides of the column, allowing 30mm for the corner overlap, and clamp in place. Start with short pieces to allow for staggered adjacent joints. Cut one board to the width of the column.
- Commence cladding from the base of the column through to the structural soffit.
- Fix the side panels to the angles with 40mm Glasroc F screws at 150mm maximum centres. Refer to Figure 178.
- Joints over cavities must be back blocked with a 60mm minimum width block for the length of the joint. Screw fix at 150mm maximum centres. Refer to Figure 179.
- Use 70mm Glasroc F screws for board to board fixing of the front panel to the side panels, at 150mm maximum centres.
- Continue sheeting up the column maintaining a 600mm min. offset of all adjacent joints. Trim the panels at the top of the column to ensure a tight fit against the soffit.

Note: All joints should be tight fitting to avoid the requirement for caulking. Caulk any gaps 3 to 6mm with CSR fire rated sealant.

Figure 177: Three Sided Encasement Framing

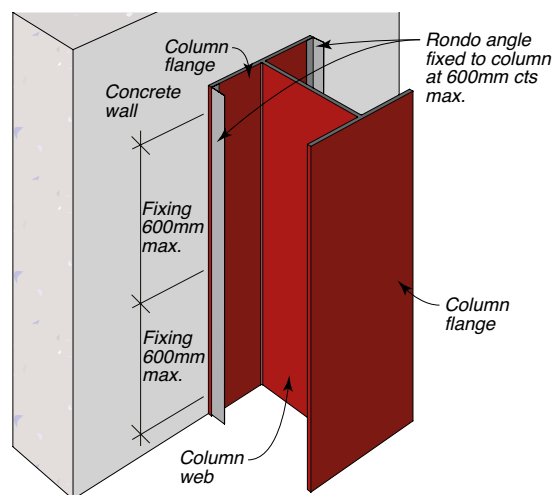


Figure 178: Three Sided Encasement Panel Fixing

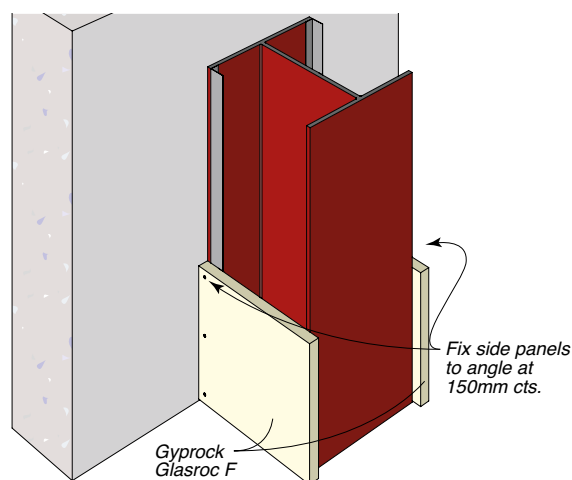
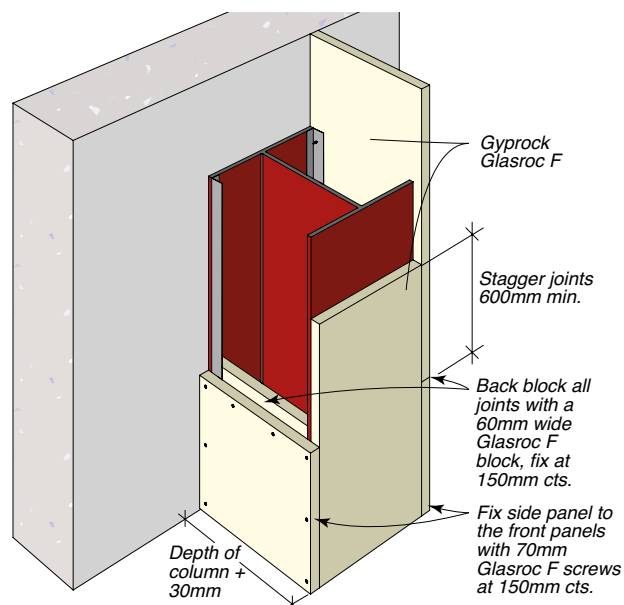


Figure 179: Three Sided Encasement Back-Blocking



## Installation For Three Sided Column Encasement

### Column Web Parallel To The Wall

- Fix 25mm Rondo angle to the wall at 600mm maximum centres, positioned to allow for the insertion of back blocking at panel butt joints.
- Fix Rondo angle flush with the outer edge of the column flange and secure using appropriate fixings (e.g. power nails) to column at 600mm maximum centres. Refer to Figure 181.
- Cut two boards for opposite sides of the column, allowing 30mm for the corner overlap, and clamp in place. Start with short pieces to allow for staggered adjacent joints. Cut one board to the width of the column.
- Commence cladding from the base of the column through to the structural soffit.
- Position the side panels and screw-fix to the angles with Glasroc F screws at maximum 150mm centres. Refer to Figure 182.
- Use 70mm Glasroc F screws for board-to-board fixing of the side panel to the front panels at 150mm maximum centres.
- All butt joints must be back blocked with a 60mm minimum width block for the length of the joint. Screw fix at 150mm maximum centres. Refer to Figure 179. Back blocks may be cut into two for ease of insertion if required.
- Continue sheeting up the column, maintaining a 600mm min. offset of all adjacent joints. Trim the panels at the top of the column to ensure a tight fit against the soffit.

Note: All joints should be tight fitting to avoid the requirement for caulking. Caulk any gaps 3 to 6mm with CSR fire rated sealant.

Figure 180: Three Sided Encasement With Steel Angle

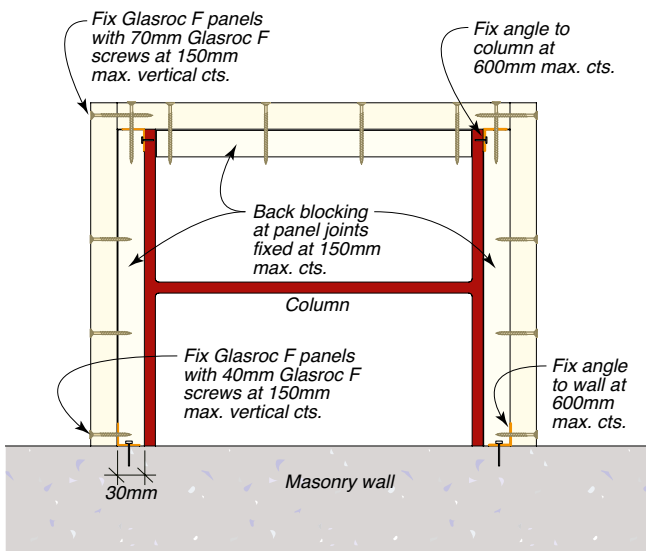


Figure 181: Three Sided Encasement Framing

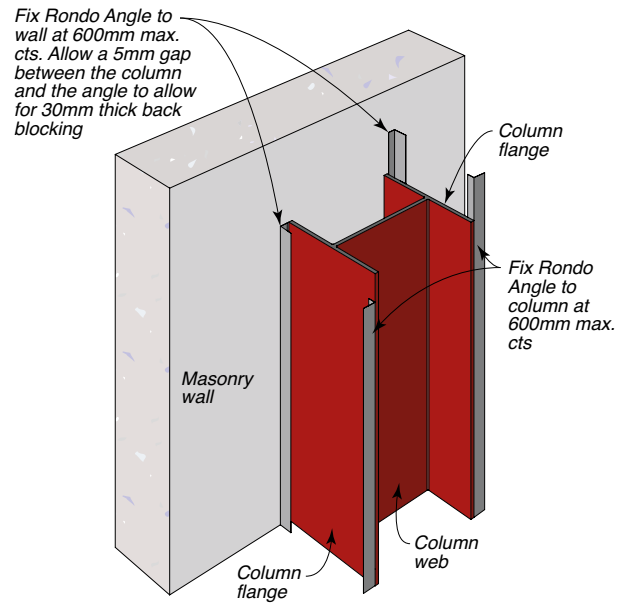


Figure 182: 3 Sided Encasement Panel Fixing

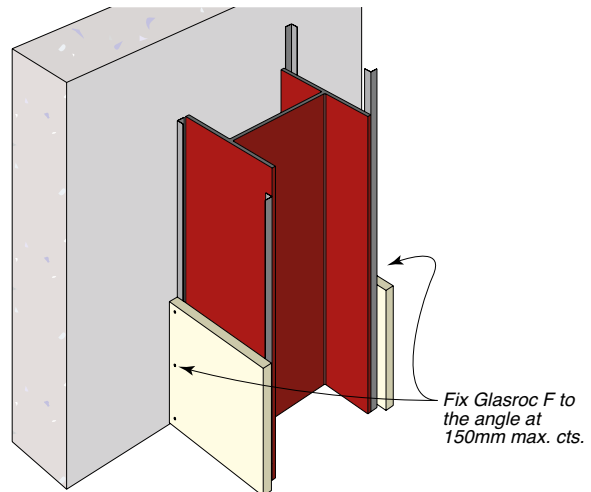
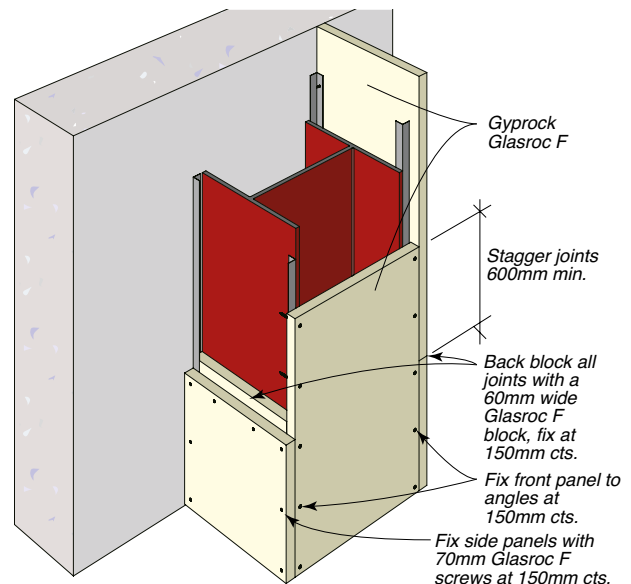


Figure 183: Three Sided Encasement Back-Blocking



Three



## Beam Encasement Systems

Figure 184: Three Sided Beam Encasement

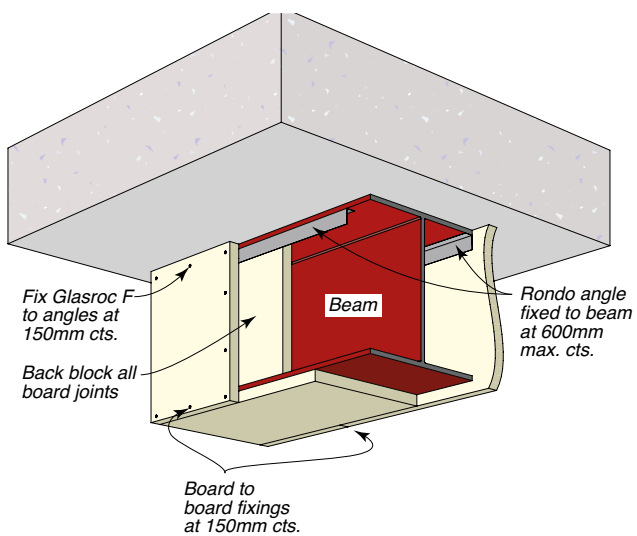


Figure 185: Three Sided Beam Encasement With Wall

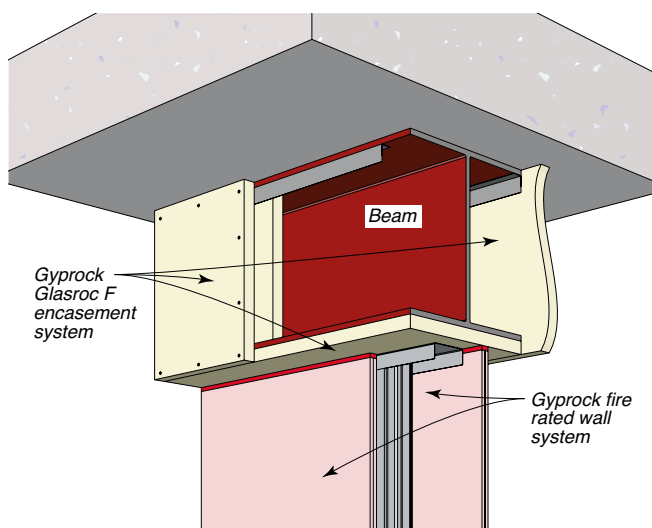
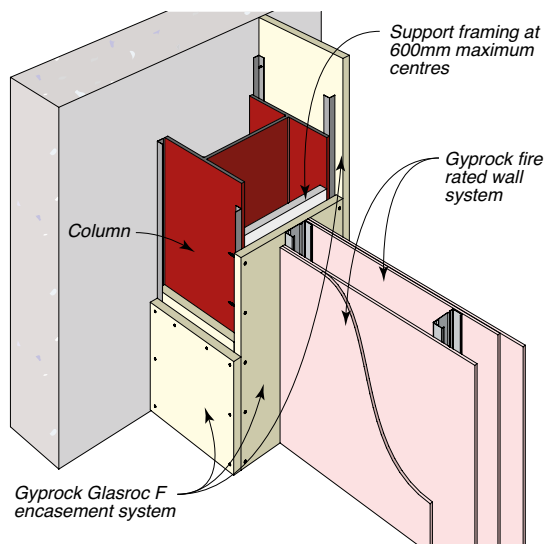


Figure 186: Three Sided Column Encasement With Wall



Additional Encasement Systems

Figure 187: Column Beam Encasement Junction

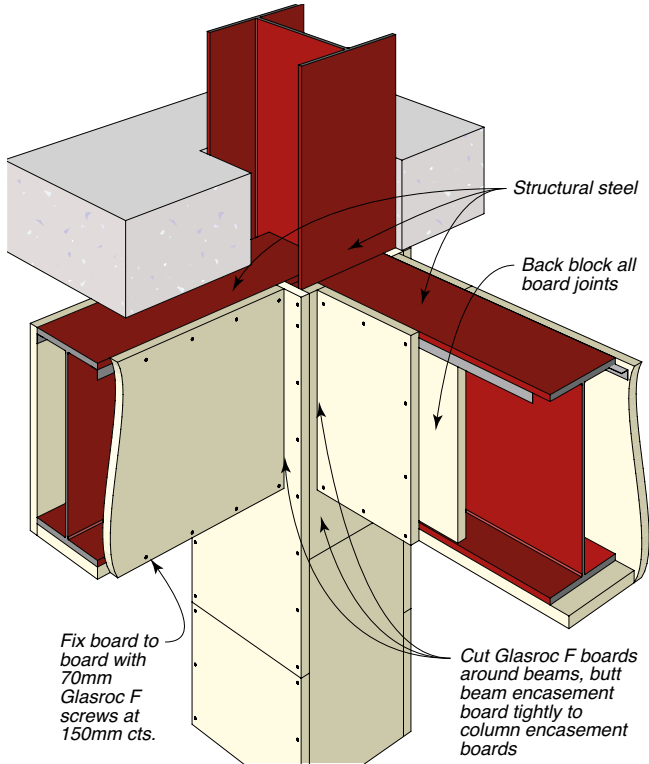


Figure 190: Typical Base Plate Enclosure

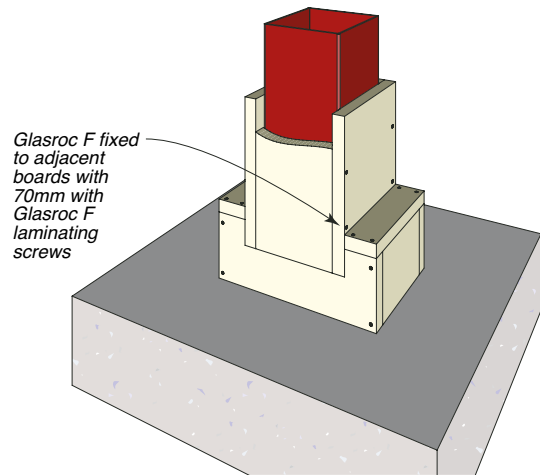


Figure 188: Flange Protection With Packers

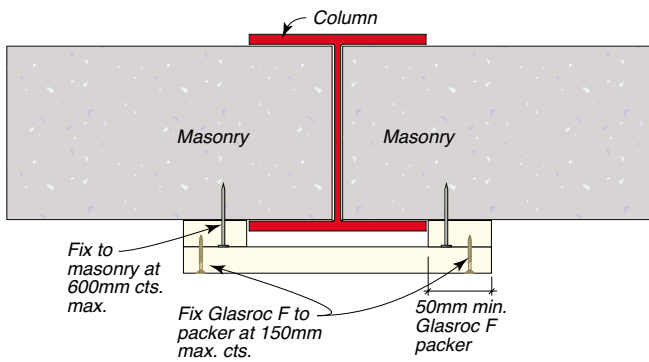
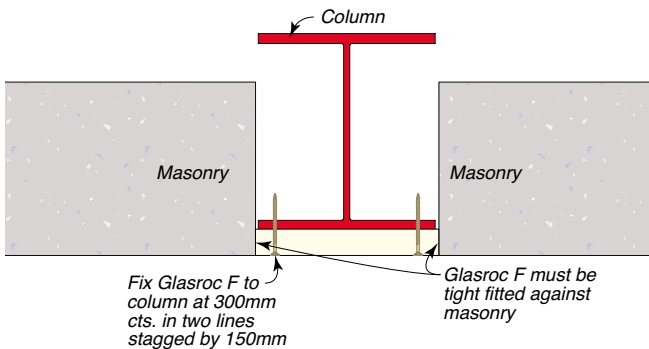


Figure 189: Flange Protection Flush With Masonry



# Special Solutions – Fire Rated

## Round Column Encasement – Fire Rated

Appraisal FC 12946.

Limits to the curving radii of fire grade plasterboard linings can result in a need to use alternative encasement framing solutions in order to achieve fire protection of round and irregular shaped columns.

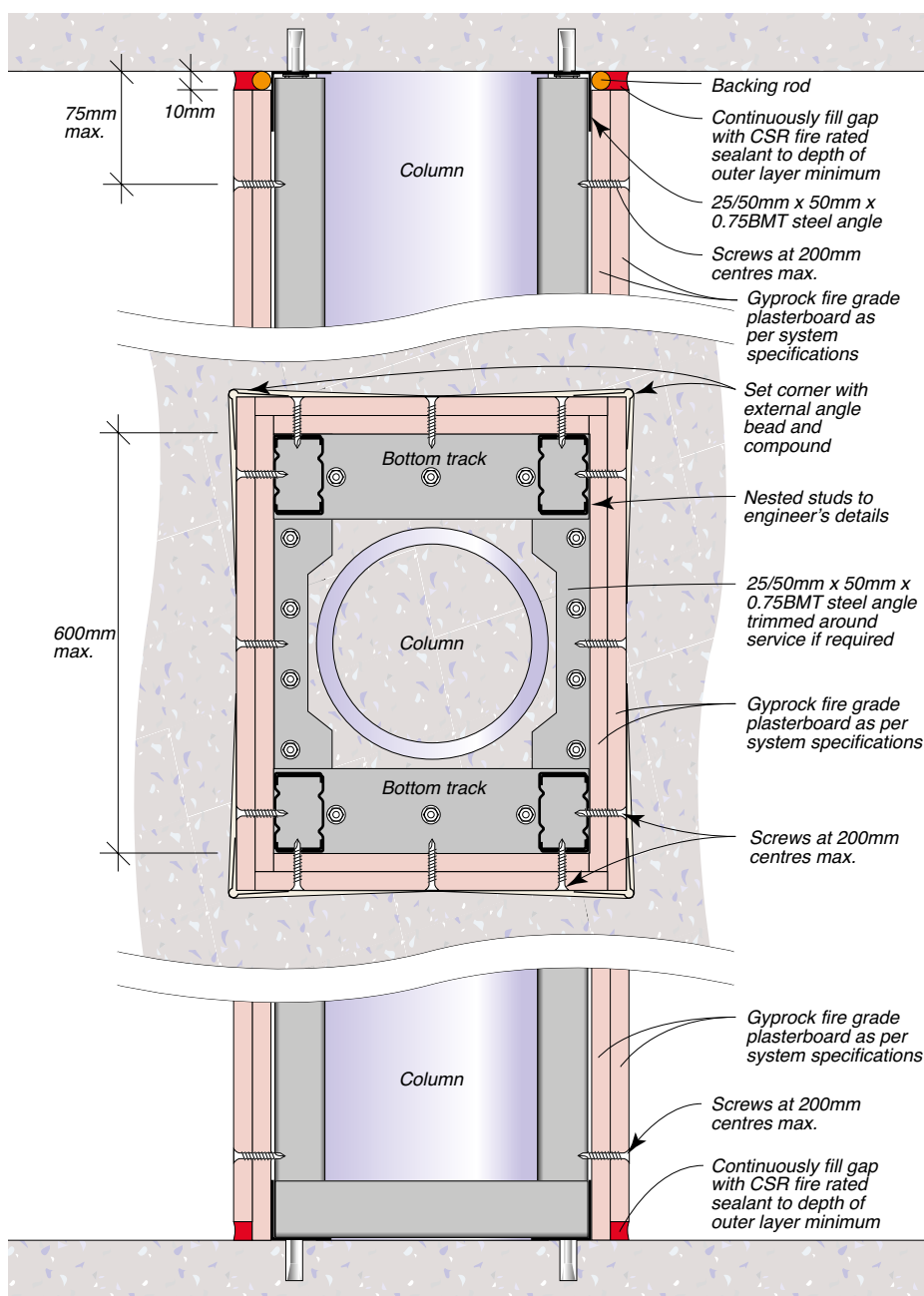
Light steel wall framing installed in accordance with Red Book fire rated wall systems and the Gyrock Commercial Installation Guide can be used to achieve fire protection of round or irregular shaped columns.

One layer of all sheet joints must be paper taped and set with a CSR Gyrock Base Coat in order to achieve CSR system FRL.

External corners must be further protected with base coat set corner angle beads to prevent light impact damage.

The protection of columns with lightweight construction may be required to comply with BCA clause C1.8 requirements for the fire-resisting covering of steel or equivalent columns. BCA C1.8 requires that voids between the fire lining and column must be filled solid to a height of not less than 1.2m above floor level to prevent indenting. Additionally columns at risk of damage from vehicles, equipment or materials movement must be protected by steel or other suitable materials.

Figure 191: Round Column Encasement – Fire Rated



## Concrete Blade Column Encasement – Fire Rated

Appraisal as noted.

### Non-Discontinuous Blade Column Junctions And Encasement

Fire rated blade columns can be abutted to or enclosed within fire rated light weight wall systems using non-discontinuous wall construction methods. Control joints must however be employed at changes in structure to ensure that linings are isolated and relieved from structural movement.

Depending on the building class and type of development, walls may also need to be of discontinuous construction in order to satisfy BCA sound transmission and insulation requirements.

Figure 192: Blade Column To Non-Discontinuous Lightweight Wall Junction With Service Cavity  
Appraisal FC 12946

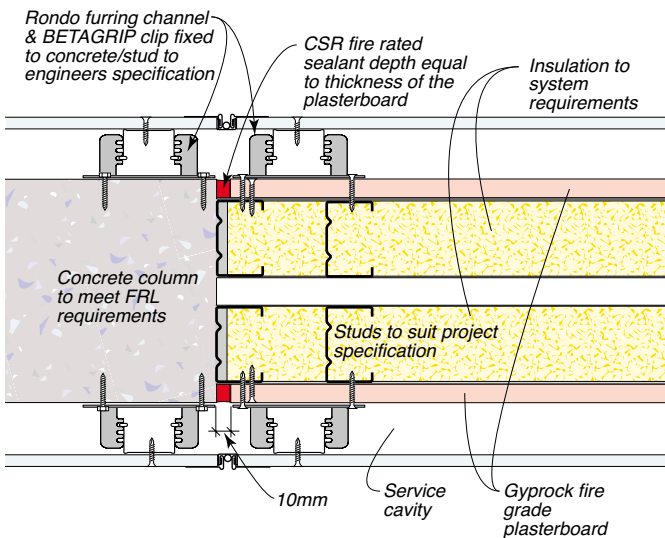
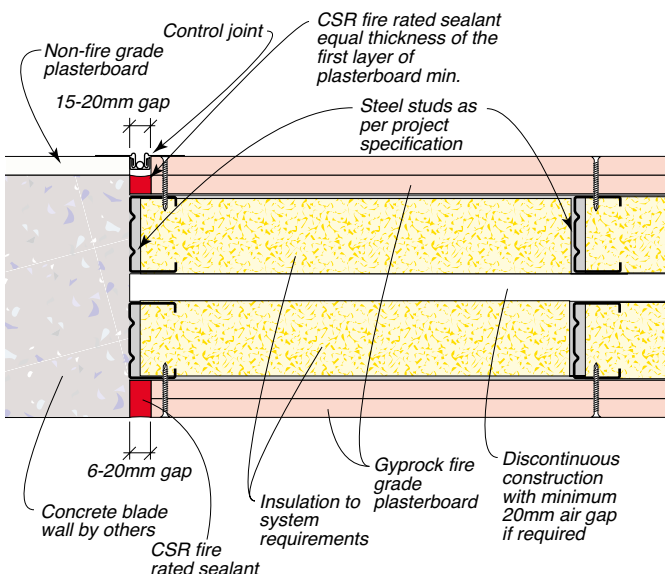


Figure 193: Blade Column To Non-Discontinuous Lightweight Wall Junction – Alternative  
Appraisal FC 12946



### Discontinuous Blade Column Encasement

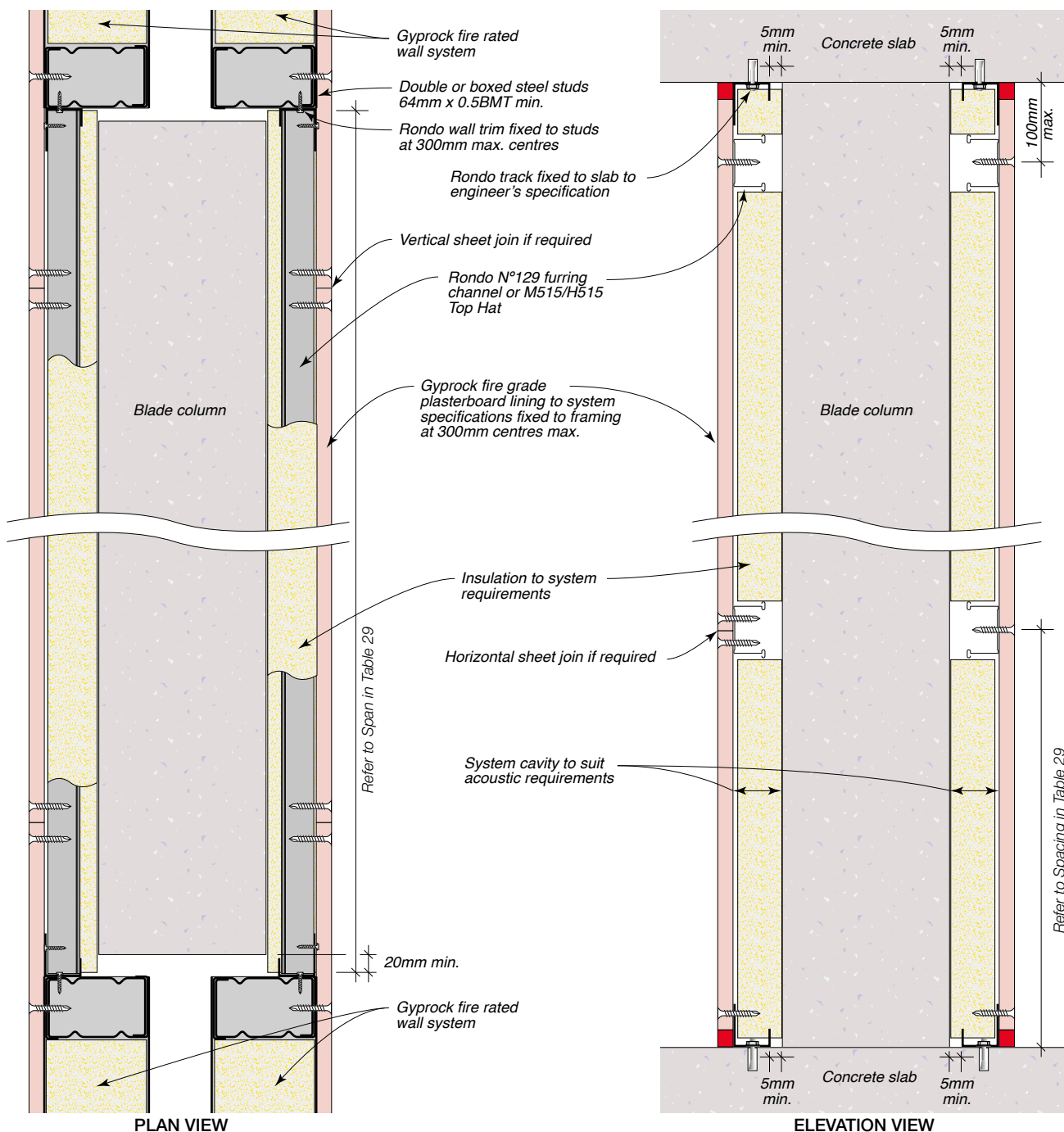
Medium and high rise construction methods typically involve the use of concrete slab floors to achieve fire separation between levels. Concrete slab floors are often supported by narrow footprint concrete, core filled block or AFS blade columns which can then be encased within separating walls in order to maximise usable floor areas. It may also be necessary to provide and maintain discontinuous wall construction as required by the BCA.

Plasterboard wall linings also need to be isolated or relieved from structural and differential framing movements, particularly at column to framing transitions in order to minimise cracking and wall lining in service faults.

Isolation of plasterboard linings has traditionally been achieved via the use of control joints at every change in structure or by the construction of an additional light weight wall in front of load bearing structural elements. Excessive use of control joints can however impact on desired wall finish and aesthetics whilst additional walls built in front of columns results in a reduction of occupancy floor areas.

CSR Gyprock's Discontinuous Blade Wall Encasement system provides builders and designers with a narrow footprint, discontinuous construction and an acoustically compliant wall solution that can accommodate blade wall lengths of up to 1640mm. Very narrow wall depths with small cavities of 20mm featuring high density insulation cavity infill may also be considered however input from a project acoustic consultant is recommended to ensure acoustic performance. Insulation materials may also need to be evaluated for combustibility to ensure compliance with BCA wall construction requirements for the relevant building type and construction class.

Figure 194: Discontinuous Blade Column Encasement Framing & Lining  
Appraisal FAR 4503.



Blade Column Encasement Notes:

- Use Rondo N°P140 track with Rondo N°129 furring channel.
- Use Rondo N°P142 track with Rondo N°515 top hat.

Table 29: Rondo Framing Spacing & Span Specifications

Rondo Framing Section	Spacing (mm)	Maximum Span (mm)		
		Wind Pressure kPa (Ult.)		
		0.375	0.5	1.0
N°129 Furring Channel	600	1400	1350	1070
	400	1600	1550	1230
	300	1760	1710	1360
M515 Top Hat	600	1090	1050	830
	400	1250	1200	950
	300	1370	1320	1050
H515 Top Hat	600	1220	1180	930
	400	1400	1350	1070
	300	1540	1480	1180

# Special Encasement Systems

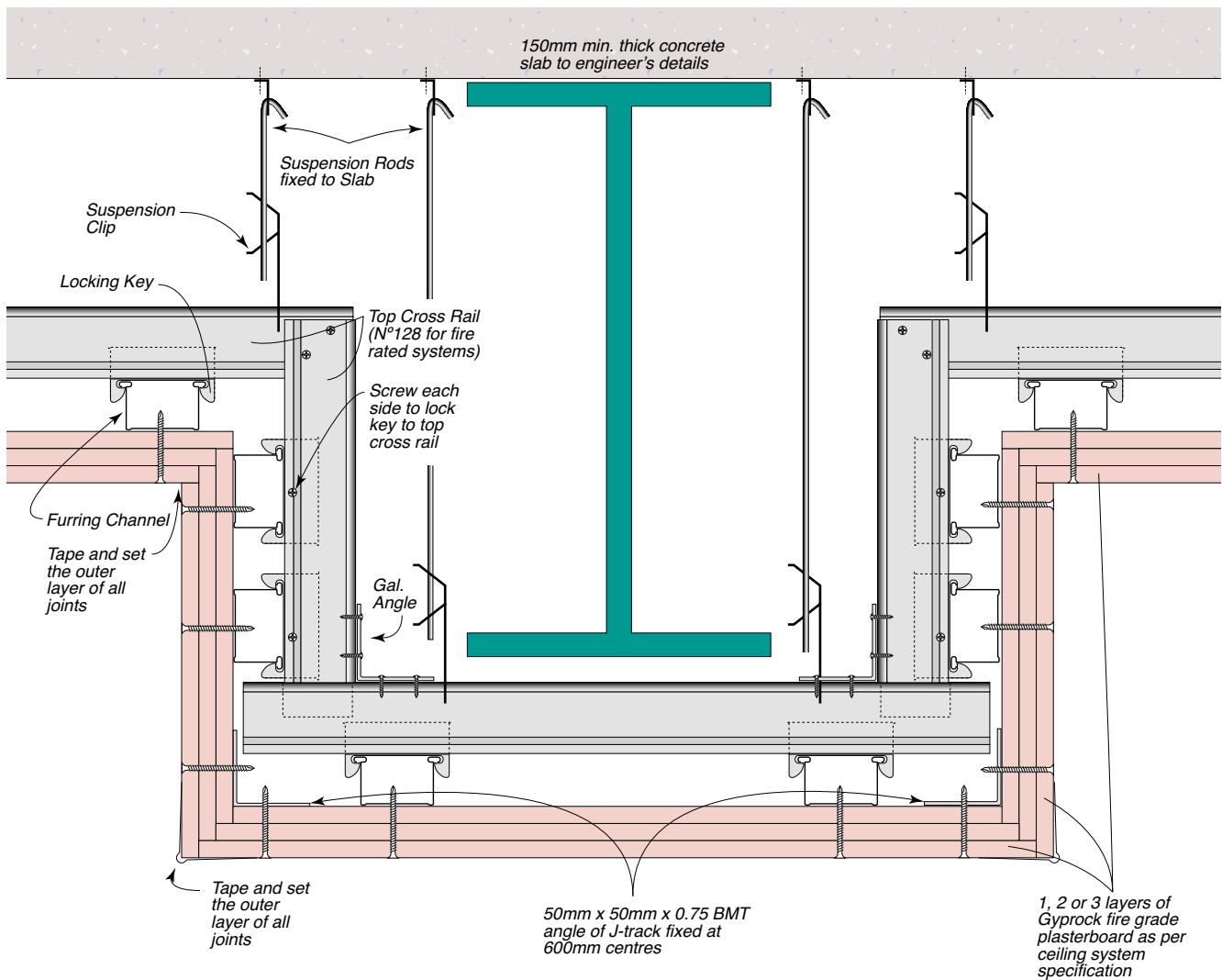
## Steel Framed Ceiling Bulkhead – Fire Rated

Appraisal EWFA 28014.

CSR Gyprock under slab suspended ceiling systems can be used to achieve one way fire rated from below ceiling solutions. Suspended ceiling systems may also need to incorporate fire rated bulkheads in order to accommodate elements such as structural beams.

Gyprock's fire rated bulkhead solution as depicted incorporates ceiling fire systems with fire linings selected to meet project FRL requirements.

Figure 195: Typical One Way Fire Rated Bulkhead Under Slab





### Steel Framed Two way Bulkhead – Fire Rated

Appraisal FAR 3052.

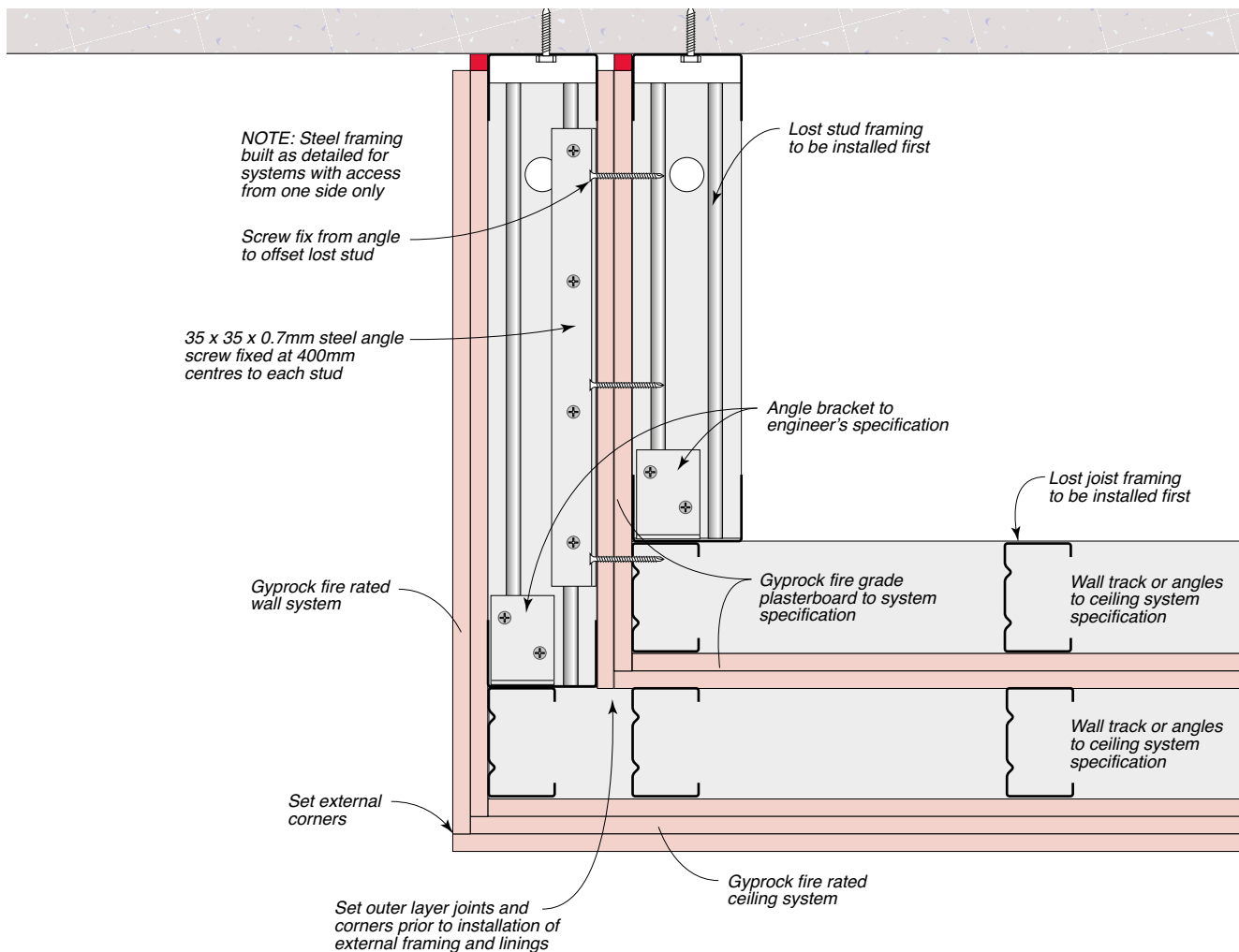
Some projects may require bulkheads that achieve two way fire resistance so that the spread of fire from both floor/room areas and services within bulkheads is controlled.

Framing and fire lining installation methods for two way systems is more complex than one way fire solutions and may require engineering input to ensure that suitable framing members and connection assembly techniques are employed.

Internal fire linings are initially installed over lost framing elements with the last installed or outermost layer sheet

joints taped and set in accordance with CSR fire system requirements. Protected framing is then installed over the internal linings with members offset from the underlying lost framing in order to facilitate connection between the inner and lost framing elements. Outer fire linings can then be installed, paper tape set and corner bead protected in accordance with the Gyprock Installation Guide and Red Book ceiling and wall system requirements.

Figure 196: Typical Two Way Fire Rated Bulkhead – Lost Framing Construction



### Steel Portal Frame Details – Fire Rated

Appraisal FAR 4376.

The following fire rated junction details have been developed to accommodate the range of movement expected from typical portal frame construction. They can be used with CSR Gyprock steel framed wall systems with fire ratings up to FRL 120/120/120, and may require additional input from structural and fire engineers. Wall systems should be selected with a structural adequacy component as the steel members are considered to be load bearing. Details are suitable for purlin and girt sections of up to 2.0BMT

No solutions are given for structural beams or bracing members that penetrate the fire rated system. A fire engineer is required to provide solutions with consideration of movement, heat transfer along members, and the effect of collapse of any elements.

Figure 197 shows typical locations for Gyprock fire rated portal details.

Figure 197: Typical Portal Frame Usage

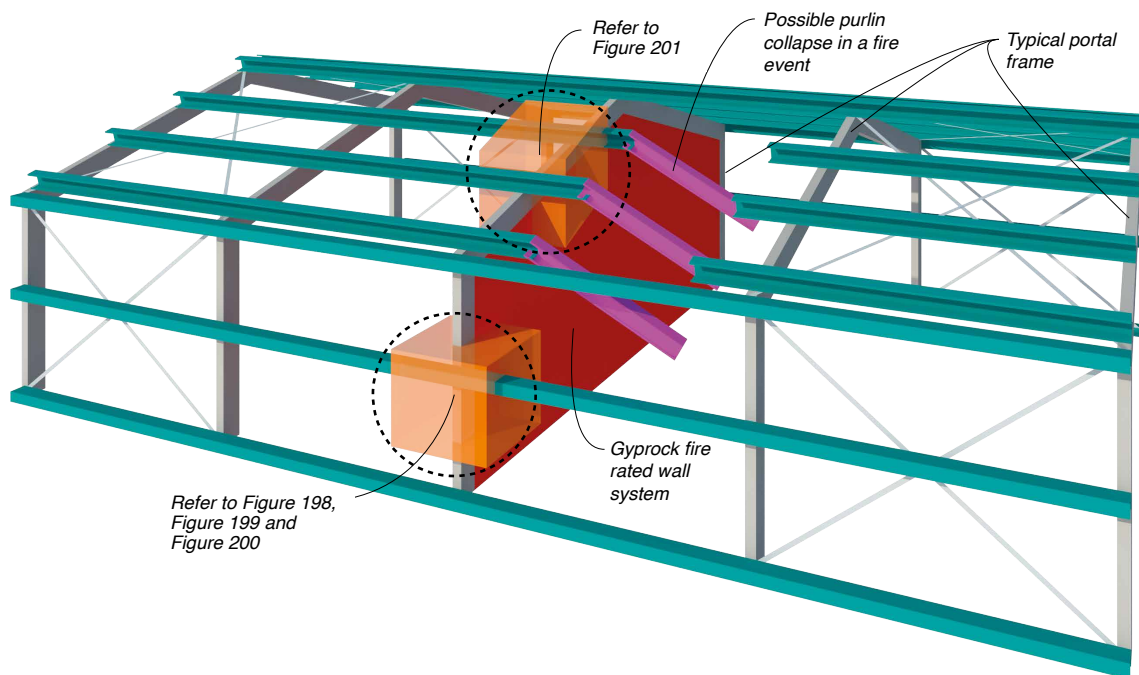
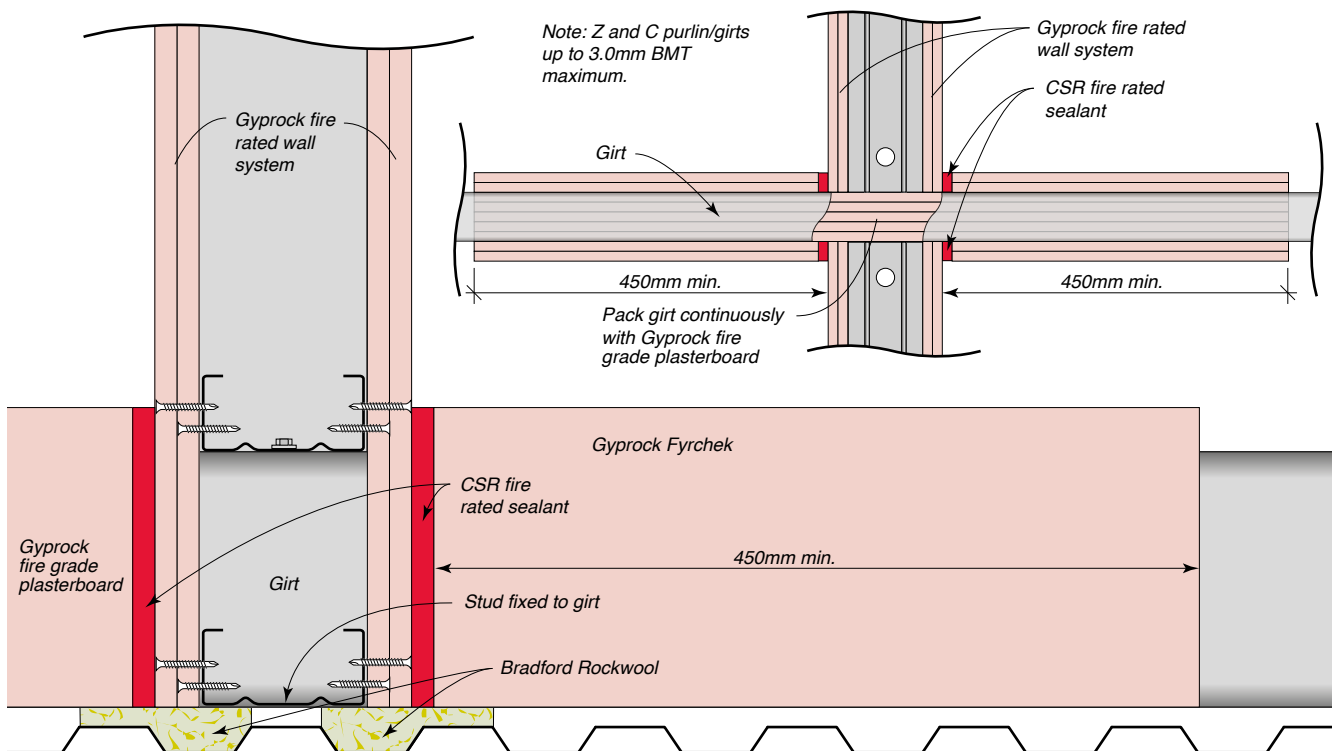
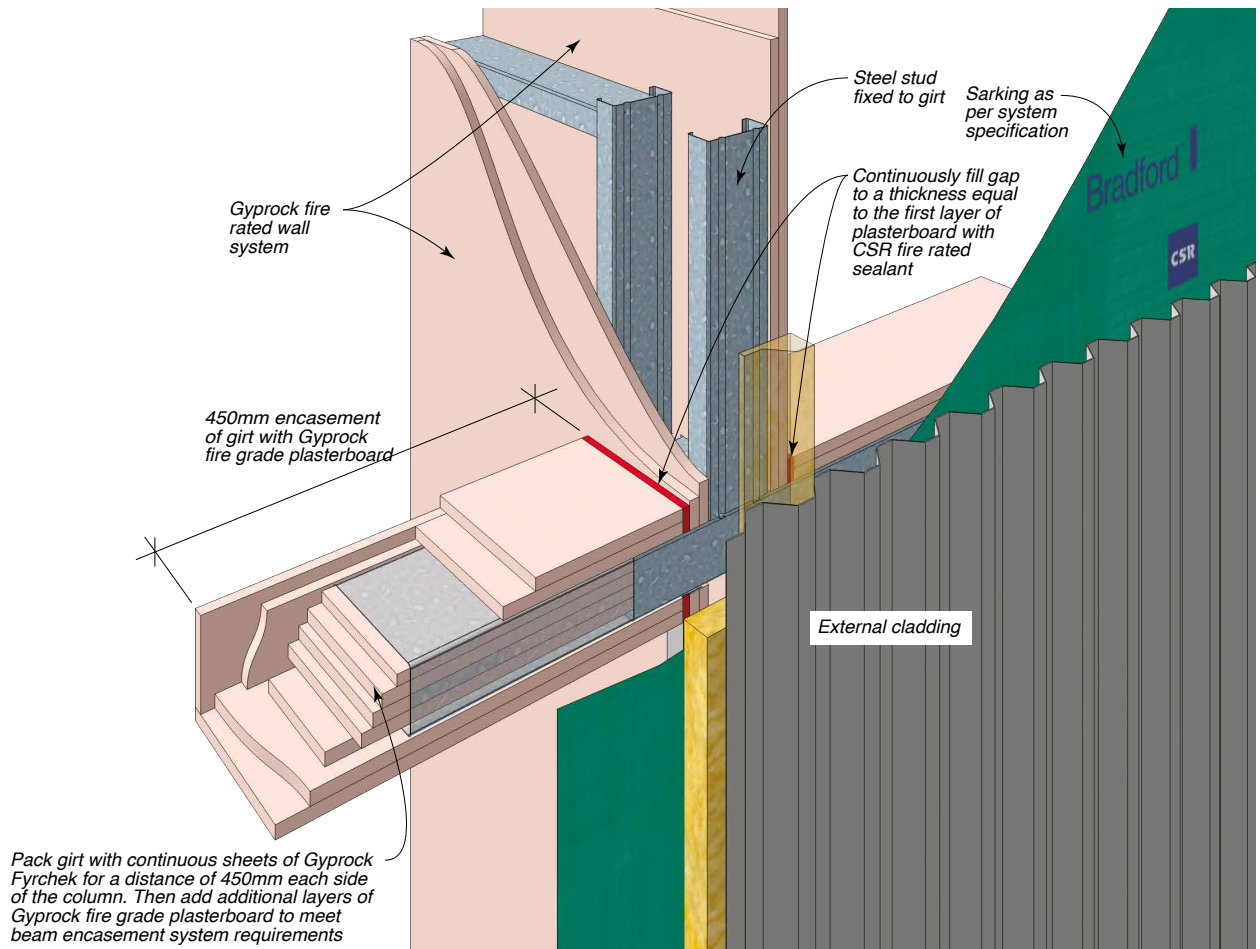


Figure 198: Portal Frame Girt – Fire Rated  
Up to FRL 120/120/120.



**Figure 199: Portal Frame Column – Fire Rated**  
Up to FRL 120/120/120.

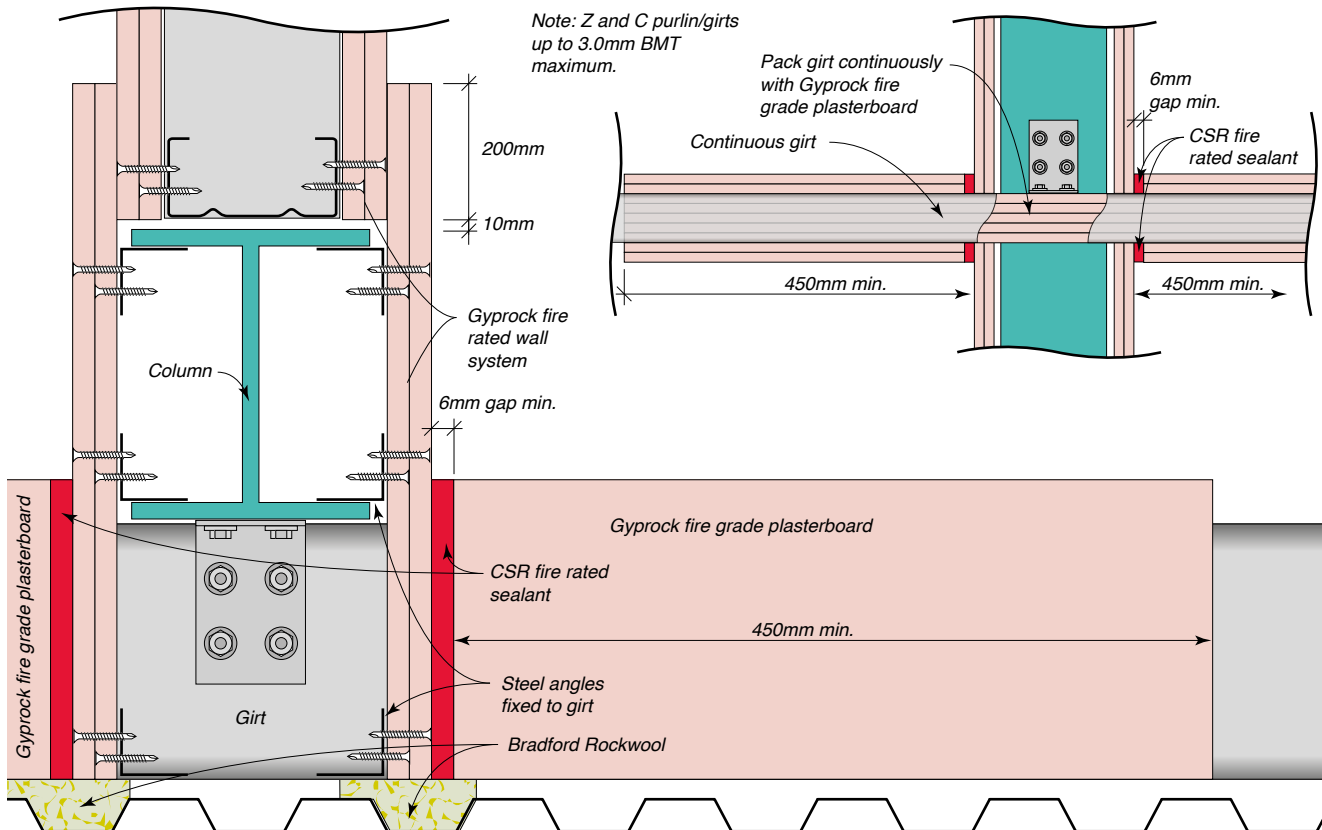
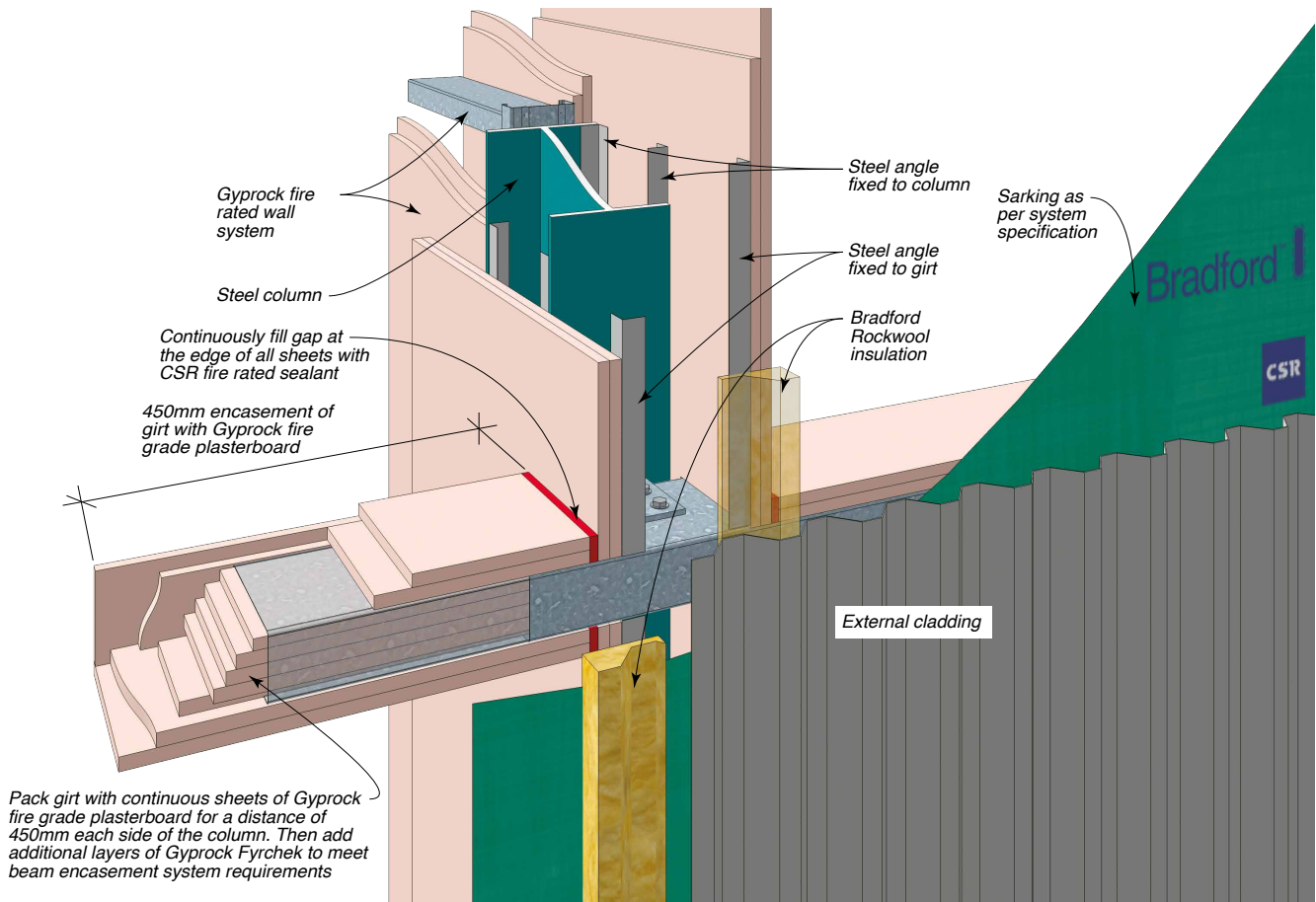
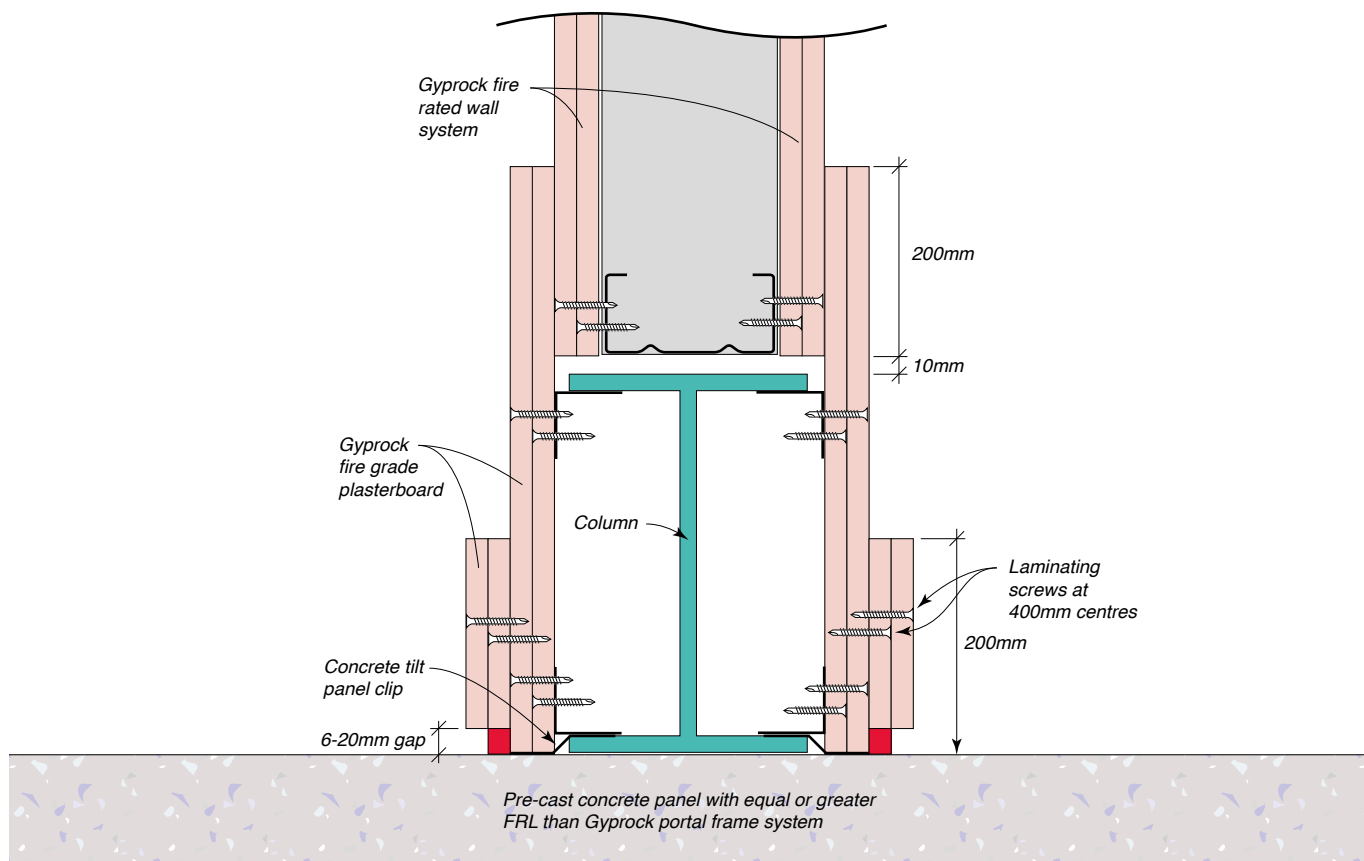
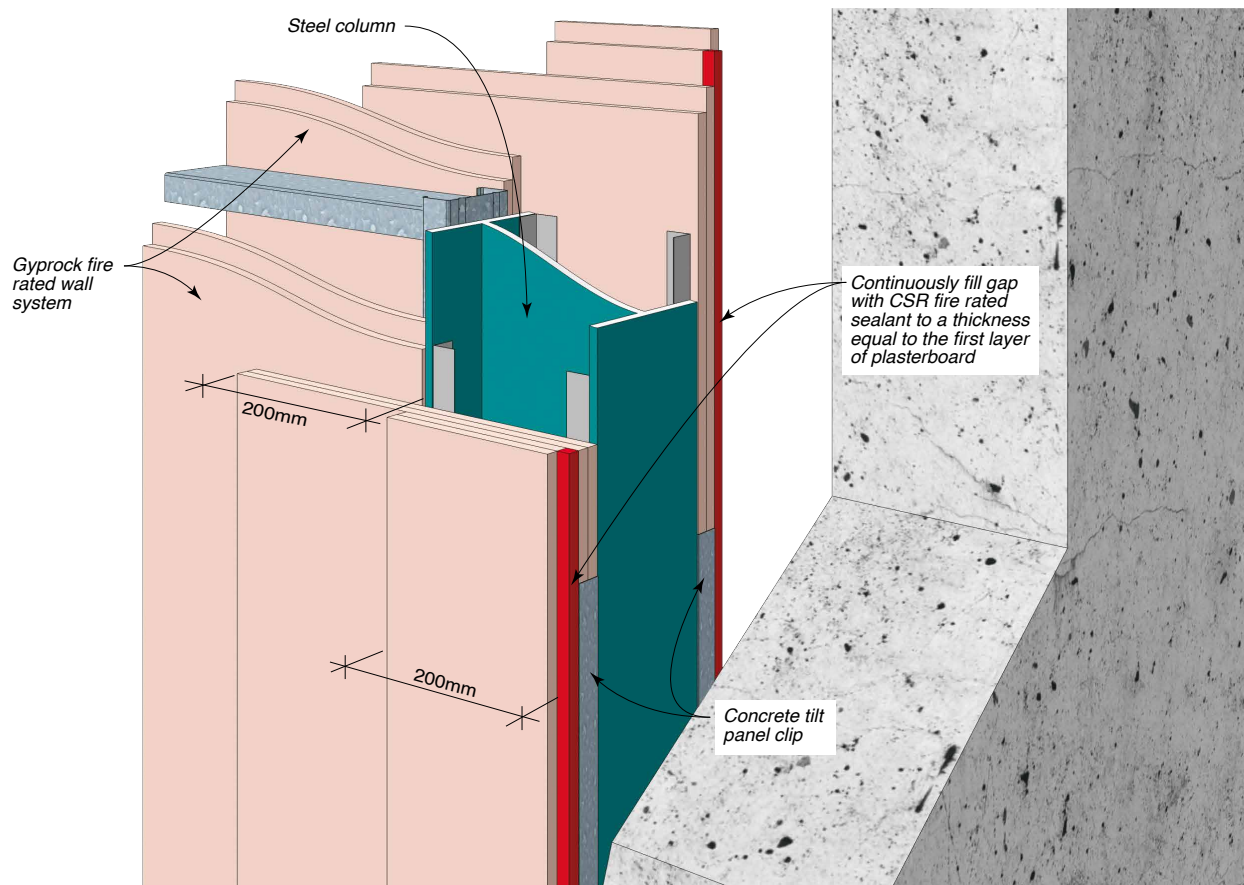
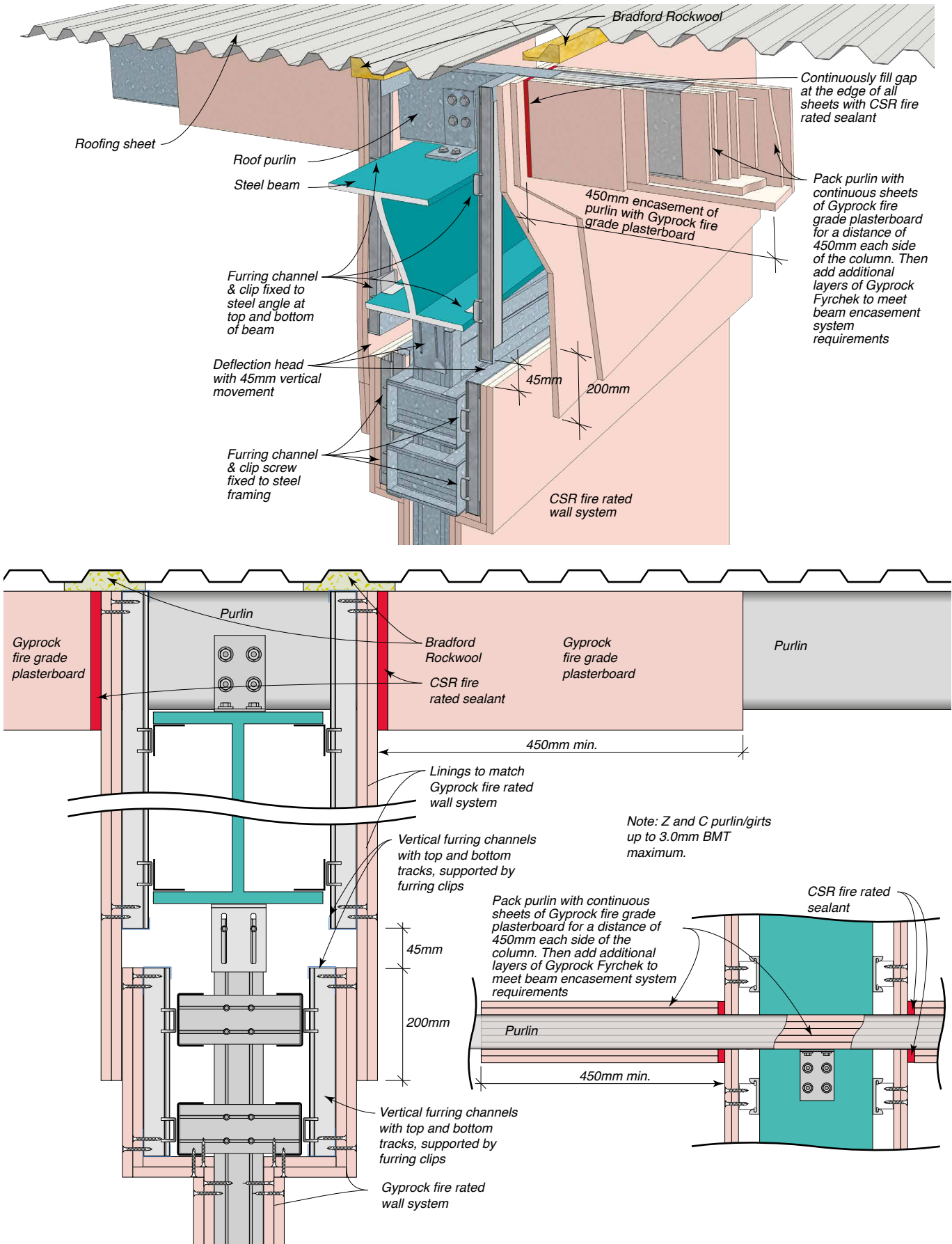


Figure 200: Portal Frame Concrete Abutment- Fire Rated  
Up to FRL 120/120/120.





**Figure 201: Portal Frame Beam – Fire Rated**  
Up to FRL 120/120/120.





# Wet Area Lining Systems

## Introduction

CSR Gyprock has developed waterproof systems for wet areas based on AS3740, the Australian waterproofing standard. The systems use a range of moisture resistant plasterboard including Gyprock Aquachek, Fyrchek MR, EC08 Impact MR, and EC08 Complete.

## Applications

The Building Code of Australia has deemed to satisfy provisions for wet areas in Class 2, 3 & 4 buildings that include compliance with Australian Standard AS3740 – Waterproofing of Domestic Wet Areas. A similar requirement applies for areas of Class 5, 6, 7, 8 and 9 buildings. Some states have additional requirements that are not included in this manual.

Wet areas are defined as areas within a building that are supplied with water. They include bathrooms, showers, laundries and toilets, and exclude kitchens, bars and other food preparation areas. The BCA specifies which walls, floors, junctions and penetrations are to be treated as waterproof or water resistant, and the Standard details the requirements for these treatments.

This manual considers the treatment of walls and wall/floor junctions in these areas.

## Description

The development of Gyprock Wet Area Lining Systems and the recommendations contained in this publication have evolved from years of extensive research conducted by CSR Building Materials Research Centre and the Building Research Centre of the University of New South Wales, and meet or exceed the requirements of AS3740.

### Protection For Wet Area Walls In Showers

- In an enclosed shower, the walls up to 1800mm high to be water resistant. Internal and external corners to 1800mm high, and wall to floor junctions within the enclosure, to be waterproof.
- In an unenclosed shower, as for an enclosed shower but extending to 1500mm (horizontal projection) from the shower rose.
- In a shower-over-bath situation, as for unenclosed shower except wall requirement may terminate at a suitable fixed shower screen. Horizontal surfaces supporting baths to be waterproof.

Refer to details in the following section.

### Protection For Wet Area Walls Outside Showers

- Wall to floor junctions to be waterproof.
- The wall 150mm above a bath and any fixed vessel such as a basin, sink, or tub if it is within 75mm of the wall, to be water resistant.

Refer to details in the following section.

For walls required to be waterproof or water resistant, tiles and a waterproof membrane are recommended over Gyprock water resistant plasterboard.

There are no requirements for treatment to ceilings of wet areas. Ceilings may be lined with Aquachek or other Gyprock plasterboard as for other areas of the building.

## Components

### Gyprock Moisture Resistant Plasterboard

CSR Gyprock manufactures a number of moisture resistant plasterboard products to cater for specific application requirements. Refer to detailed information in the Components section at the beginning of Wall Systems in this guide. Please contact your CSR Gyprock Sales Office in your region for details of stock sheet lengths, widths and thicknesses available.

Details in this section are based on the use of Gyprock Aquachek, and are suitable for use with all Gyprock moisture resistant plasterboard products.

Where Cemintel Wallboard is to be used, additional information is available in Cemintel Wet Area Systems installation guide.

### Fasteners

Tiled areas of non-fire rated walls and all fire rated walls must be all fastener fixed, adhesive and fastener fixing is not permitted.

Refer to details in the Components section at the beginning of the Wall Systems section in this guide.

### Jointing Materials

- Gyprock Wet Area Base Coat or Gyprock Ultra Base 60 MR.
- Gyprock Paper Tape.
- Gyprock finishing compounds (non-tiled areas only)

Gyprock Wet Area Base Coat or Gyprock Ultra Base 60 MR are recommended for all set sheet joints of walls required to be waterproof or water resistant. Refer to the Jointing & Finishing section of this guide for detailed information.

Where sheets are to be a substrate for tiling, set corners with paper tape and two coats of base coat. Cover all fastener heads with base coat.

Joints in non-tiled areas (that are not designated wet areas) may be finished with Gyprock finishing compounds.

### Flexible Sealant

Gyprock Wet Area Acrylic Sealant is used to seal the edge of the Gyprock plasterboard against other surfaces such as a preformed shower base or bath and around plumbing fixtures. Wet Area Acrylic Sealant may be painted if required after it is fully cured.

In fire rated systems where caulking is indicated, a fire-rated sealant such as Gyprock Fire Mastic or CSR FireSeal must be used. Where specified for joints designed for significant movement, CSR FireSeal may be used. Both products are also recommended for caulking acoustic systems.

### Waterproof Membrane

A proprietary impervious barrier assessed and classified in accordance with AS/NZS4858.

### Bond Breaker

Tape used at wall to floor junctions and movement joints and compatible with the proprietary membrane.

### Vertical Corner Flashing

- External Vertical Flashing Angle: Zinc coated steel or PVC angle 50 x 50mm. For use with external shower trays.
- Internal Vertical Flashing\*: A liquid applied membrane assessed and classified in accordance with AS/NZS4858, for use with internal shower trays.

## Perimeter Flashing

- Vertical Corner Flashing Angle: Zinc coated steel or PVC angle 50 x 50mm. For use in shower areas.
- Perimeter Flashing Angle: Zinc coated steel or PVC angle 75 x 50mm.
- Perimeter Flashing for Step-Down Slab: Such as Hypalon Flashing Strip\* 130mm width.
- Proprietary In situ Membranes\*: A proprietary impervious barrier assessed and classified in accordance with AS/NZS4858.

NOTE: \* Products supplied by others.

## Tiling

All tiling must be installed in accordance with the requirements of AS3958 part 1. Additional information on tiling may be obtained from the BRANZ publication Good Tiling Practice.

Where a waterproof membrane is used, ceramic tiles are recommended. A tile adhesive that is compatible with the membrane must be used and comply with AS4992 – ceramic tiles – grouts and adhesives.



## Framing Preparation

Ensure that all framing members to receive sheeting are plumb and true in accordance with the chosen Level of Finish, and studs are spaced at a maximum 600mm centres.

Provide noggings at 25mm above bath, purpose made shower base or sink/tub to support edges of plasterboard.

Provide suitable noggings to support the bath and other fixtures such as soap holders and towel rails.

For non-fire rated walls, framing around bath enclosures and shower bases may be checked-out to accommodate the bath or shower base flange, or alternatively, should be packed by furring to ensure that the face of the plasterboard will finish in front of the upturn on the receptacle.

When a perimeter angle flashing is used, the plasterboard sheet must not be fixed through the angle flashing to the bottom plate. An additional row of noggings must be placed 25mm above the flashing to allow the sheets to be fastened.

### Control Joints

Control joints must be installed to allow for structural movement. Allowance for movement must be made through the frame, lining and any tiles.

Refer to Control Joints in the appropriate non-fire rated or fire rated Wall Framing section for appropriate locations.

Refer to Junctions & Penetrations for appropriate details.

## Sheet Installation

Provide adequate ventilation in all structures to minimise air humidity. Excessive humidity may result in the plasterboard sagging.

**For additional installation information, refer to the appropriate non-fire rated and fire rated wall systems sections of this guide.**

### Non-Tiled Areas

Gyprock plasterboard sheets installed in non-tiled areas should be fixed and set in accordance with Level 4 or Level 5 Finish methods as detailed elsewhere in this publication.

### Tiled Areas

Where Gyprock plasterboard is applied as a substrate for tiles, the sheets must be fastened with screws only. **Adhesive/fastener fixing is not acceptable.** Installation should be to Level 3 Finish.

### Fire Rated Walls

Fire rated walls must be screw fixed. **Adhesive/fastener fixing is not acceptable.** Installation should be in accordance with wall installation details elsewhere in this guide and fire rated details later in this section.

## Construction Details – Non-Fire Rated

### Preformed Shower Base

A preformed shower base has the advantage of being easy to install over floors of timber, compressed fibre cement sheet and concrete slabs, as well as ensuring that the wall linings are kept clear of any free water likely to accumulate on the shower floor.

A number of treatments for the shower wall junctions are available depending on the class of membrane. Membranes are classified as Class 1, Class 2 or Class 3, with Class 3 having the greatest elongation capabilities.

- A preformed shower base must be installed before the wall linings. Install vertical flashing to internal corner, fixing to studs at 600mm centres where appropriate. Carry corner flashing down over the shower base lip, stopping 6mm above shower base or floor finish. Flashing is to extend a minimum height of 1800mm from the finished floor surface.
- Cut and fix the Gyprock plasterboard, leaving a 6mm gap between the bottom edge of the sheet and the shower base, and where detailed, between sheets forming an internal corner. Neatly cut holes for plumbing penetrations. Refer to wall system fixing details appropriate for the installation.
- Caulk around plumbing penetrations, and, where detailed, at sheet bases and internal corners with flexible sealant.
- Joint plasterboard with Gyprock Wet Area Base Coat and paper tape.
- An appropriate liquid membrane is applied to the face of the Gyprock plasterboard before tiling. Follow respective manufacturers' instructions. Apply membrane to the entire shower area to a minimum height of 1800mm from the finished floor surface. The membrane should extend 50mm minimum outside the shower area. Refer to appropriate illustrations.
- A compatible tile adhesive must be used to fix tiles to the membrane.

Figure 202: Preformed Shower Base Installation

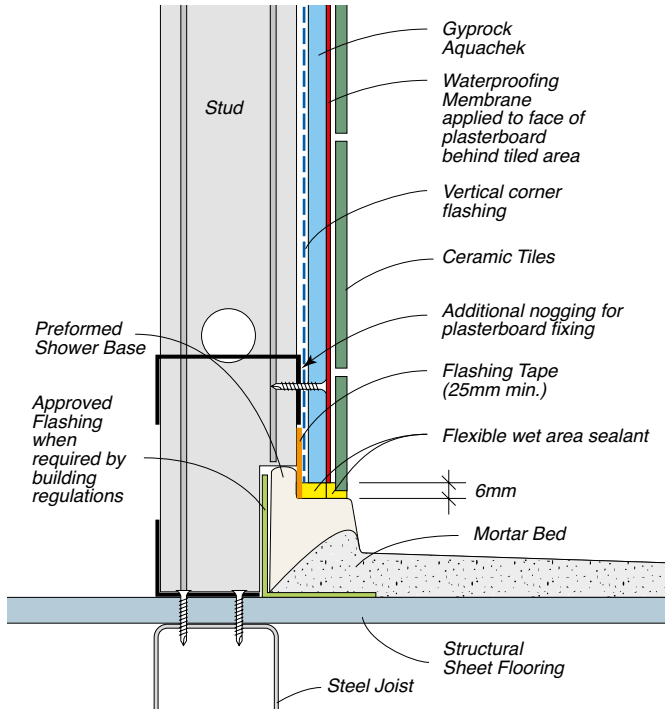


Figure 204: Preformed Shower Tray

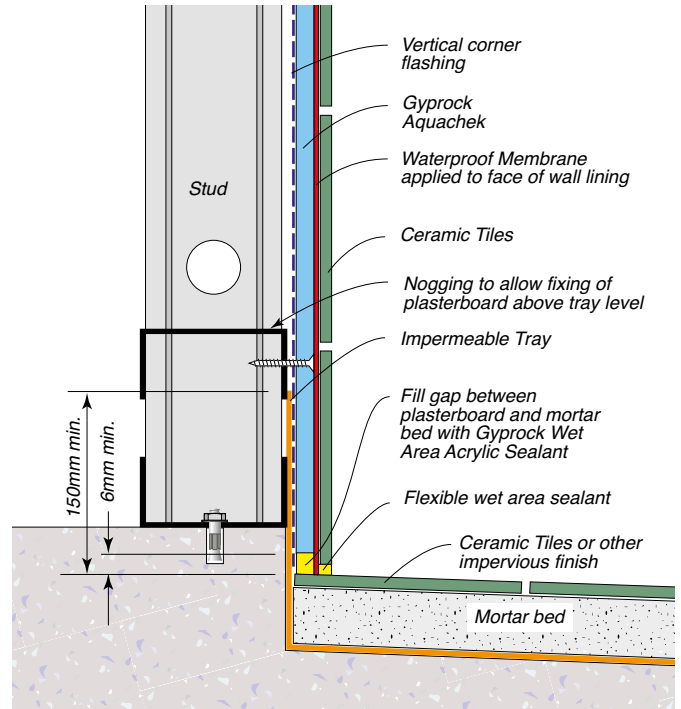


Figure 203: Typical Detail For Preformed Shower Base

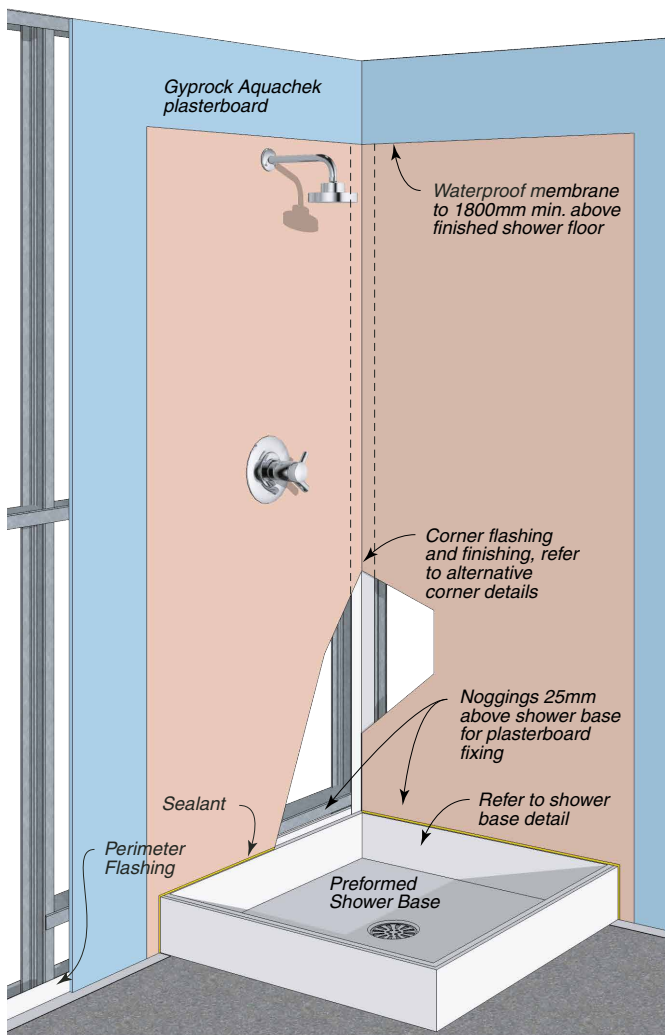
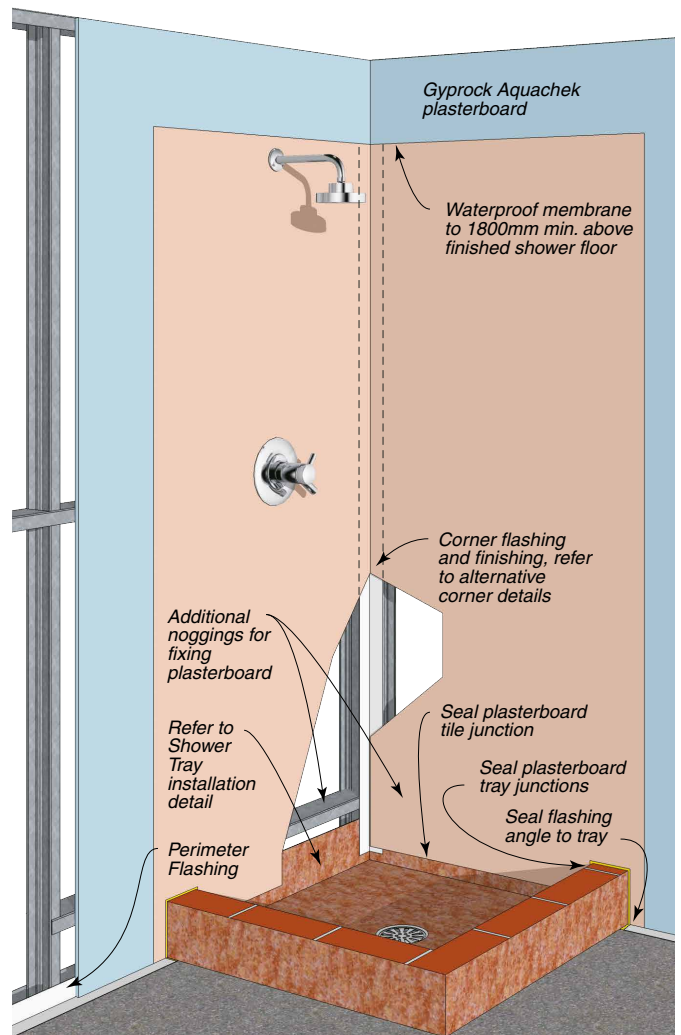


Figure 205: Typical Detail For Preformed Shower Tray





### In situ Formed Shower

Shower floors may be formed with a mortar bed and waterproof membrane. A number of treatments for the shower wall/floor are available depending on the class of membrane. Membranes are classified as Class 1, Class 2 or Class 3, with Class 3 having the greatest elongation capabilities.

- Cut and install flashing angle to the wall/floor junction if required by building regulations. Fix to floor only.
- Install flashing vertically to internal corners from 1800mm above floor level, stopping 6mm above floor level. Fix to studs at 600mm vertical centres where appropriate.
- Cut and fix the Gyprock plasterboard, leaving a 6mm gap between the bottom edge of the sheet and the shower floor, and where detailed, between sheets forming an internal corner. Neatly cut holes for plumbing penetrations. Refer to wall system fixing details appropriate for the installation
- Caulk around plumbing penetrations, and, where detailed, at sheet bases and internal corners with flexible sealant.
- Joint plasterboard with Gyprock Wet Area Base Coat and paper tape.
- An appropriate liquid membrane is applied to the face of the Gyprock plasterboard and floor to form an in situ tray. Follow respective manufacturers' instructions. Apply membrane to the entire shower area to a minimum height of 1800mm from the finished floor surface. The membrane should extend 50mm minimum outside the shower area. Refer to appropriate detail.
- A compatible tile adhesive must be used to fix tiles to the membrane.

Figure 206: In situ Formed Shower Recess – Class 1 Membrane

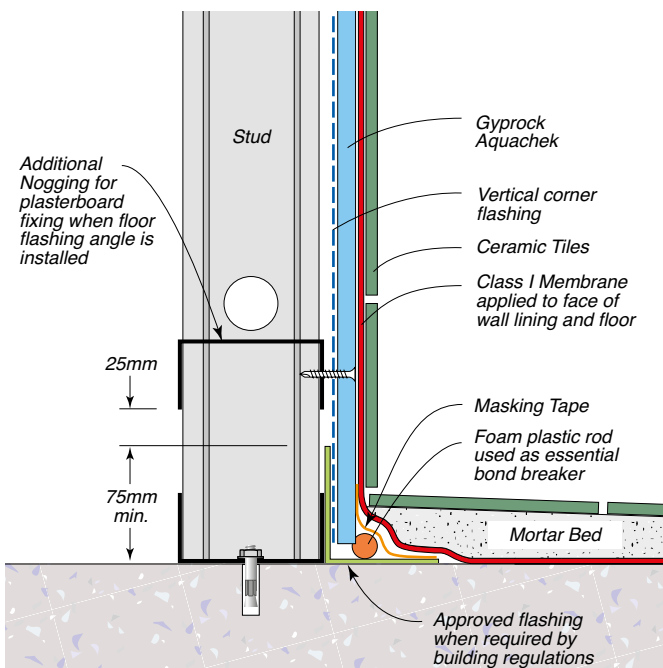


Figure 207: In situ Formed Shower Recess – Class 2 Membrane

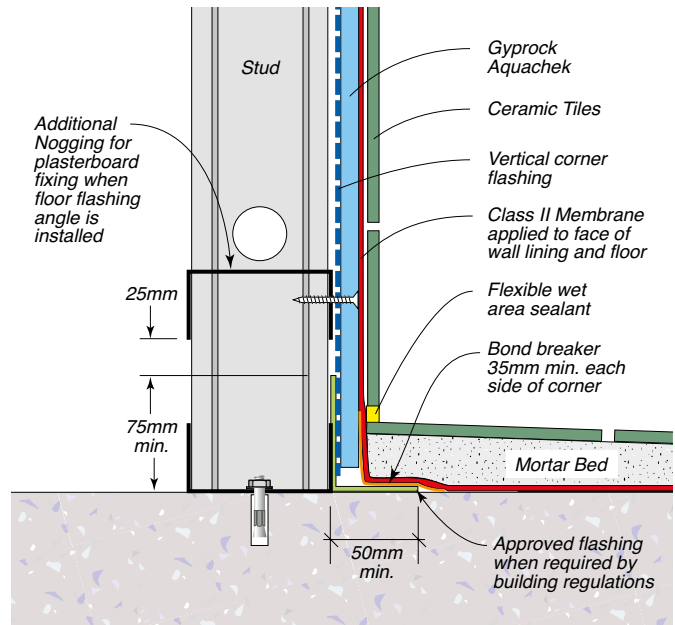


Figure 208: In situ Formed Shower Recess – Class 3 Membrane

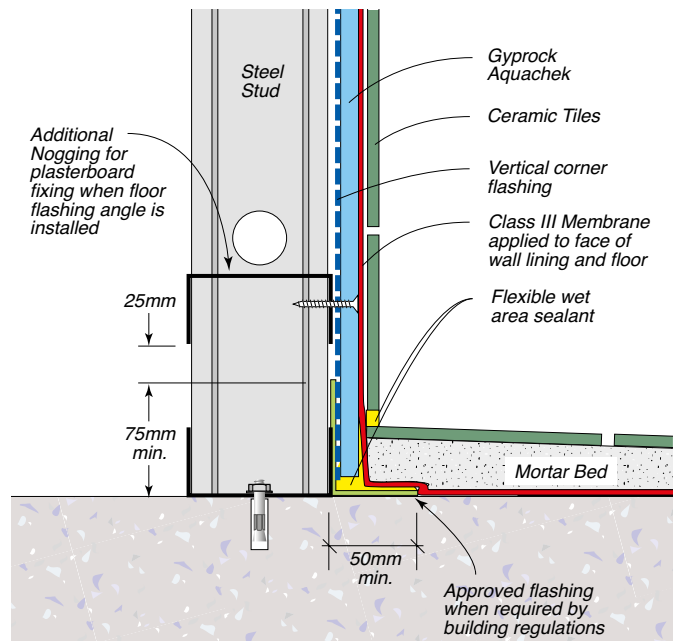




Figure 209: In situ Formed Shower Recess With Hob

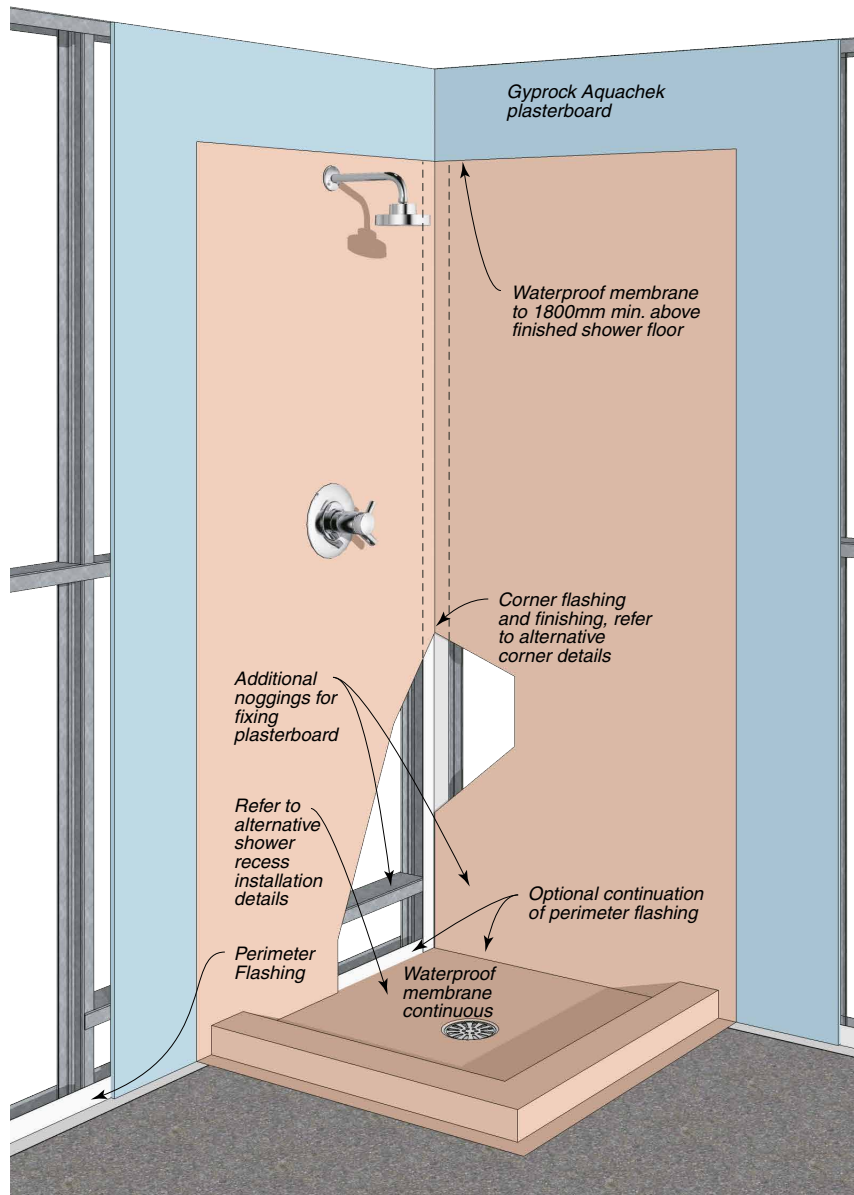
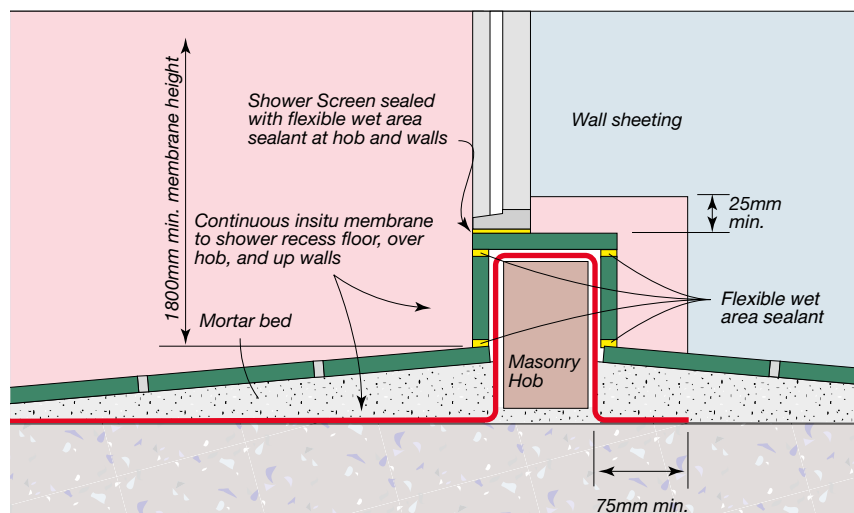


Figure 210: In situ Formed Shower Recess With Hob



## Shower Area – Masonry Walls

Install furring at maximum 600mm centres using appropriate masonry fixings.

Place noggings between furring, at finished floor level and 25mm above a bath, purpose-made shower base or sink/tub to support the edges of sheets.

Provide suitable noggings to support the bath and other fixtures such as soap holders and towel rails.

Fix Gyprock plasterboard to metal furring with Type S Needle Point Screws.

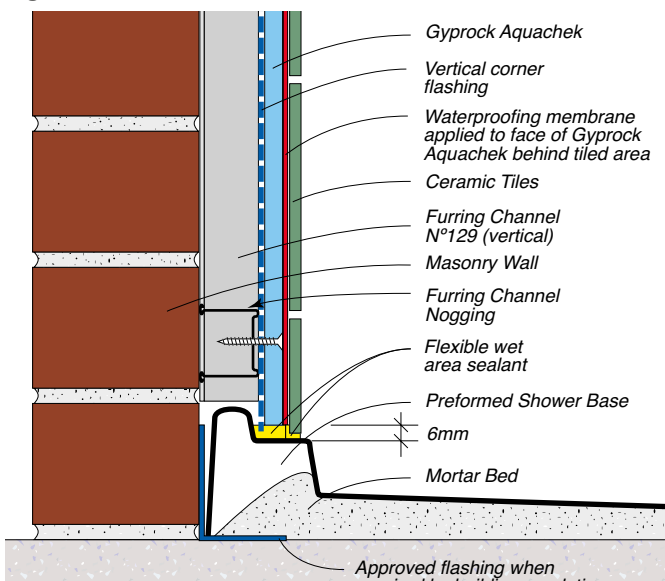
Fix to Part N° 333 with 20mm screws.

Fix to Part N°129 or 308 with 25mm screws.

## Preformed Shower Base

- Cut and install flashing angle to the wall/floor junction if required by building regulations. Fix to floor only.
- Install flashing vertically to internal corners from 1800mm above floor level, stopping 6mm above floor level. Fix to studs at 600mm vertical centres where appropriate.
- Cut and fix the Gyprock plasterboard, leaving a 6mm gap between the bottom edge of the sheet and the shower base, and where detailed, between sheets forming an internal corner. Neatly cut holes for plumbing penetrations. Refer to wall system fixing details appropriate for the installation
- Caulk around plumbing penetrations, and, where detailed, at sheet bases and internal corners with flexible sealant.
- Joint plasterboard with Gyprock Wet Area Base Coat and paper tape.
- Seal face of Gyprock moisture resistant plasterboard to 1800mm minimum above the floor with a waterproof membrane.
- Refer to appropriate junction details.

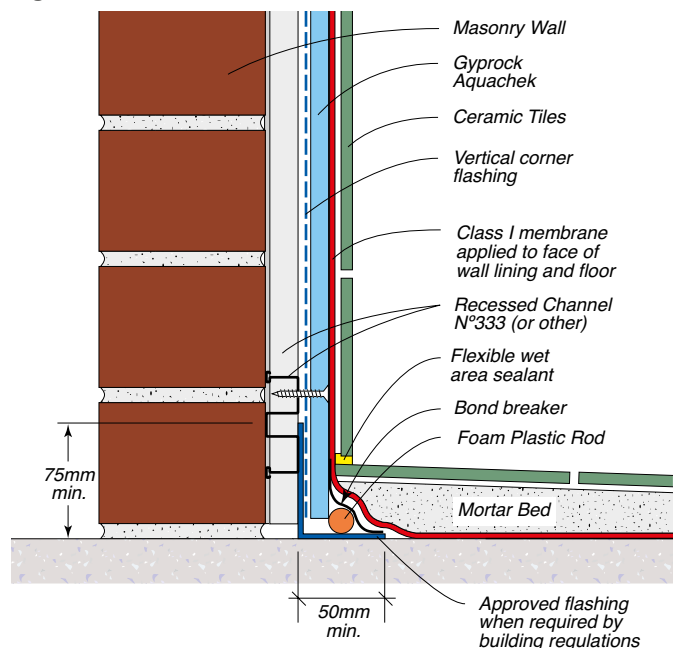
Figure 211: Preformed Shower Base



## In situ Formed Shower Recess – Ceramic Tiled

- Cut and install flashing angle to the wall/floor junction if required by building regulations. Fix to floor only.
- Install flashing vertically to internal corners from 1800mm above floor level, stopping 6mm above floor level. Fix to studs at 600mm vertical centres where appropriate.
- Cut and fix the Gyprock plasterboard, leaving a 6mm gap between the bottom edge of the sheet and the floor/flashing, and where detailed, between sheets forming an internal corner. Neatly cut holes for plumbing penetrations. Refer to wall system fixing details appropriate for the installation
- Caulk around plumbing penetrations, and, where detailed, at sheet bases and internal corners with flexible sealant.
- Joint plasterboard with Gyprock Wet Area Base Coat and paper tape.
- Proprietary waterproof membrane materials are to be applied to the face of the Gyprock moisture resistant plasterboard and floor to form an in situ tray. Seal face of plasterboard to 1800mm minimum above the floor with a waterproof membrane.
- Refer to appropriate junction details.

Figure 212: In situ Formed Shower Recess – Ceramic Tiled



## Shower Over Bath – Unenclosed or Partially Enclosed

- Cut and install flashing angle to the wall/floor junction if required by building regulations. Fix to floor only.
- Install flashing vertically to internal corners from 1800mm above floor level, stopping 6mm above floor level. Fix to studs at 600mm vertical centres where appropriate.
- Cut and fix the Gyprock plasterboard, leaving a 6mm gap between the sheet and the floor, the sheet and the bath, and where detailed, between sheets forming internal corner. Neatly cut holes for plumbing and bath penetrations. Refer to wall system fixing details appropriate for the installation
- Caulk around plumbing penetrations, and, where detailed, at sheet bases and internal corners with flexible sealant.
- Joint plasterboard with Gyprock Wet Area Base Coat and paper tape.
- Proprietary liquid membrane materials are applied to the face of the Gyprock Aquachek and the floor. Always follow respective manufacturers' instructions.
- A compatible tile adhesive must be used to fix tiles to the membrane.
- Extent of floor treatment is shown for fibre cement or concrete flooring only. For timber based flooring, waterproof entire floor.

Figure 213: Membrane Detail For An Unenclosed Shower Over Bath Or Shower Area

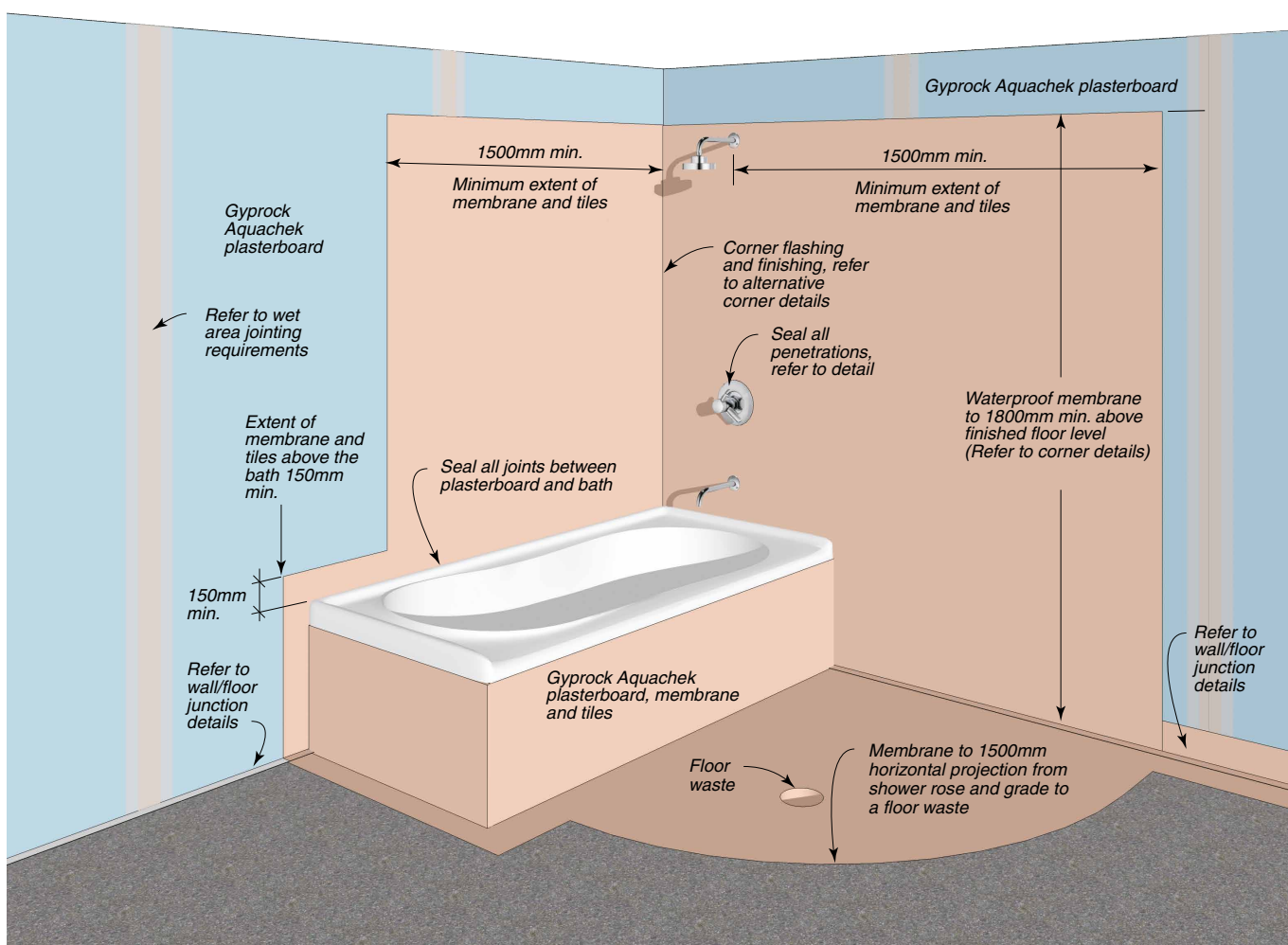


Figure 214: Membrane Detail For A Semi-Enclosed Shower Over Bath Or Shower Area

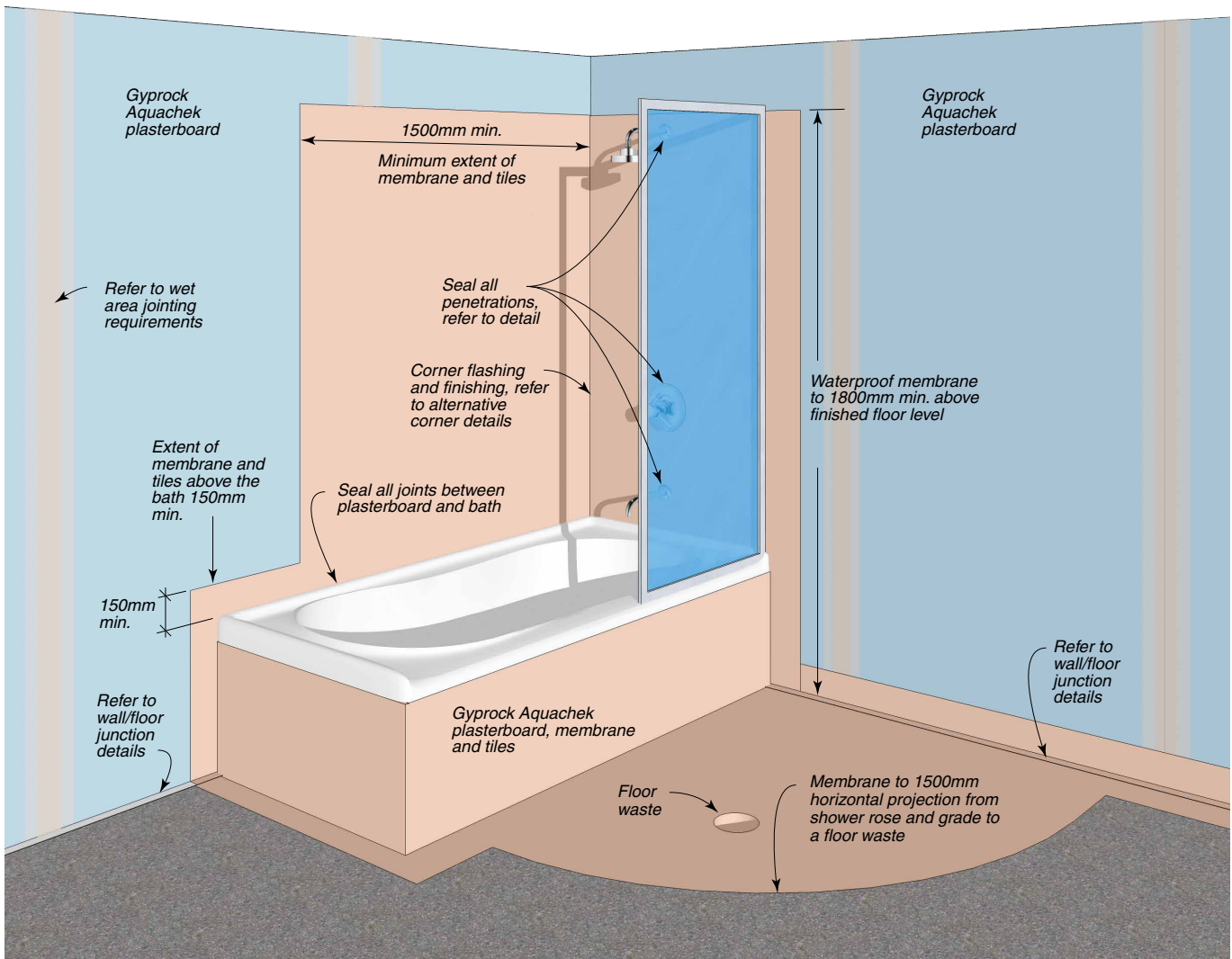


Figure 215: Internal Corner Detail – Class 1, 2 or 3 Membrane

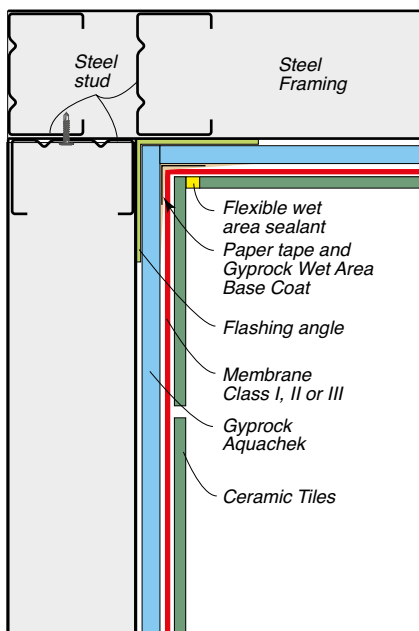


Figure 216: Internal Corner Detail – Class 2 Membrane

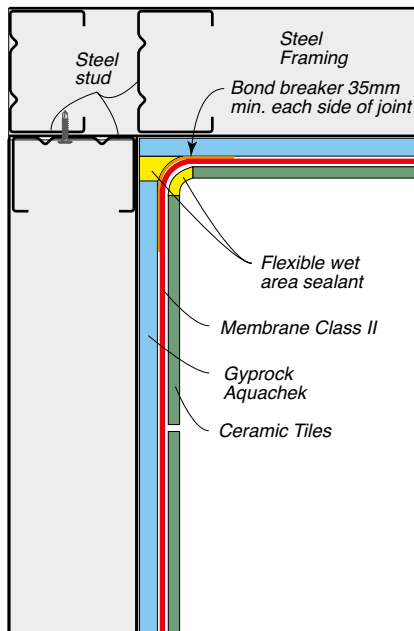
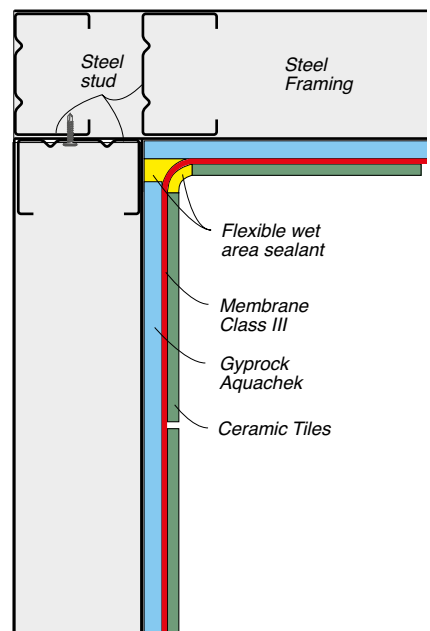


Figure 217: Internal Corner Detail – Class 3 Membrane



## Bath & Basin

Refer to previous construction methods detailed for Shower Over Bath installations and the following details.

Figure 218: Installation Layout For A Bath Without Shower

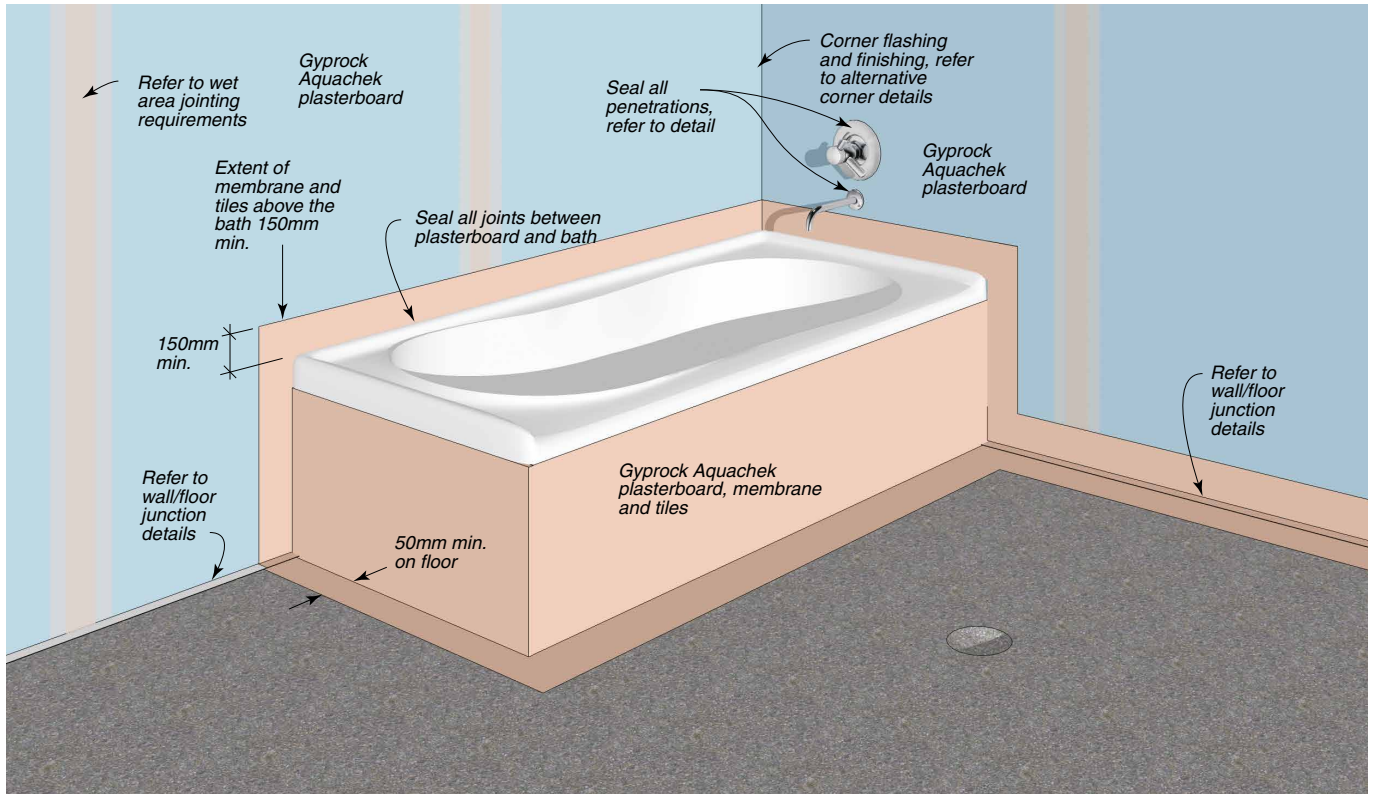


Figure 219: Bath Installation

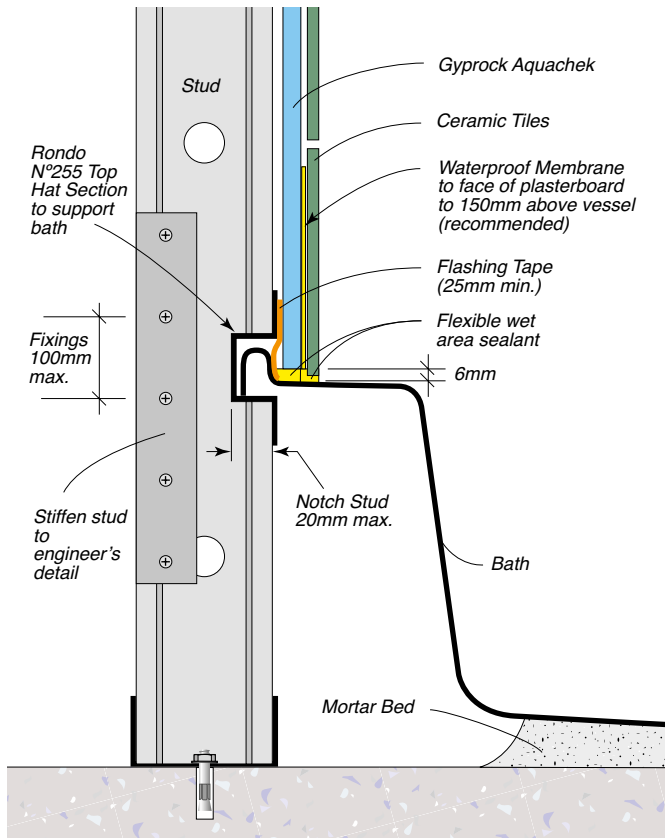


Figure 220: Bath Hob

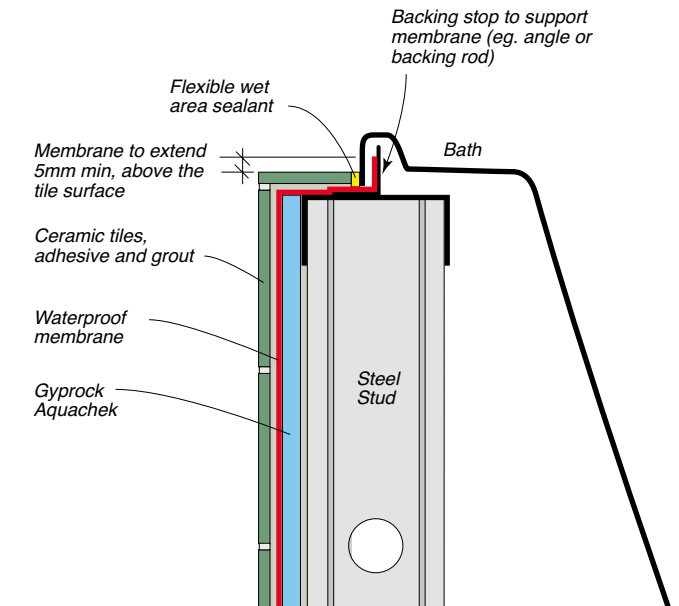




Figure 221: Typical Hand Basin – Membrane/Tiling Detail



Figure 222: Laundry Tub/Sink Installation

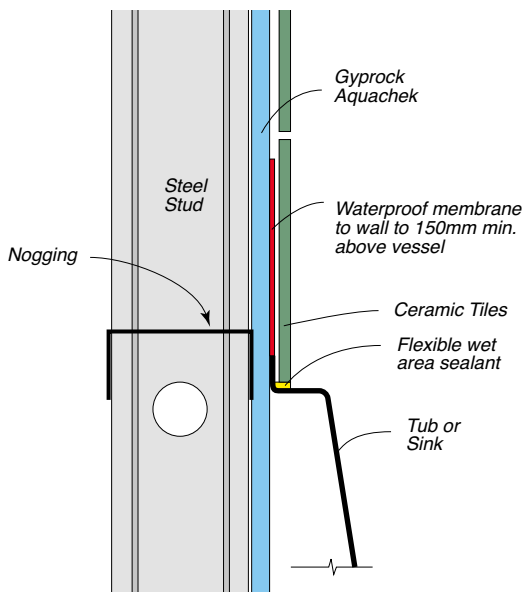
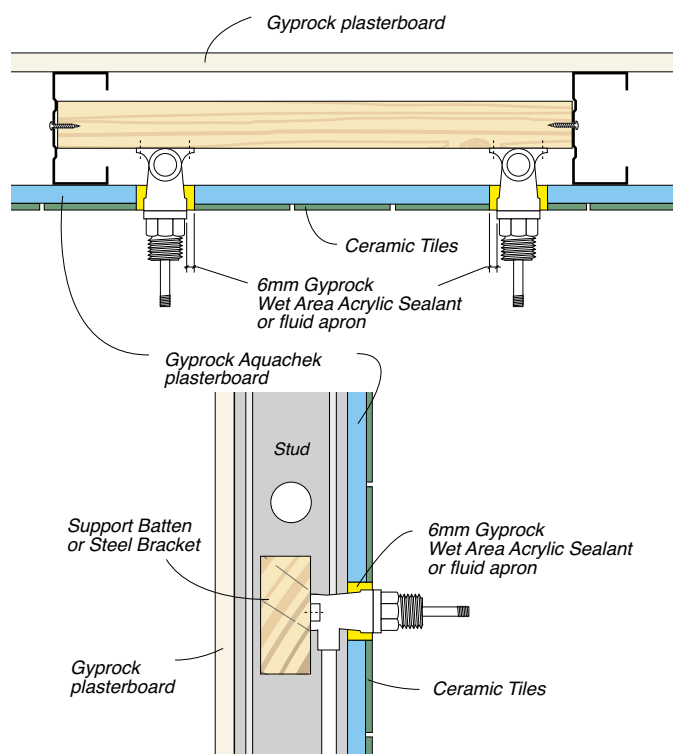


Figure 223: Plumbing Penetrations





General Wet Areas

Figure 224: Perimeter In situ Membrane

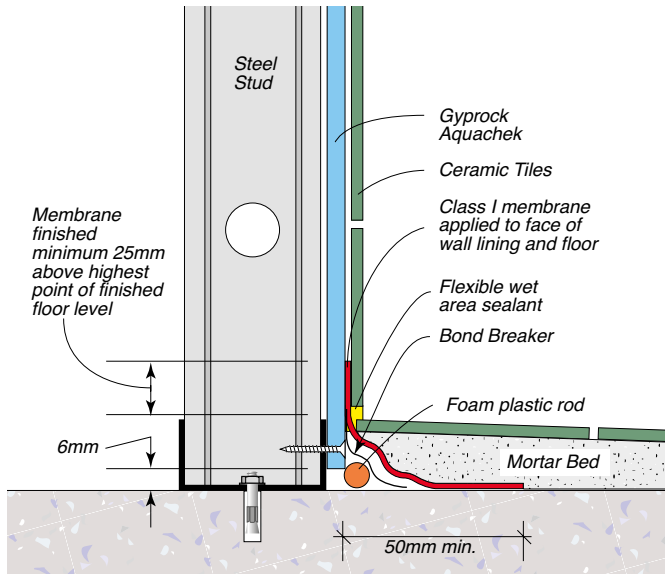


Figure 226: Perimeter Angle Flashing

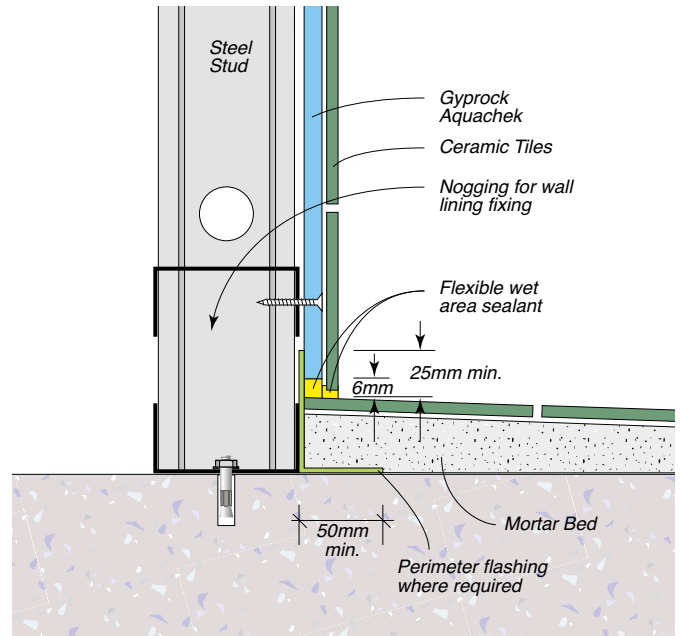


Figure 225: Hob Or Set-Down Slab And Perimeter Flashing

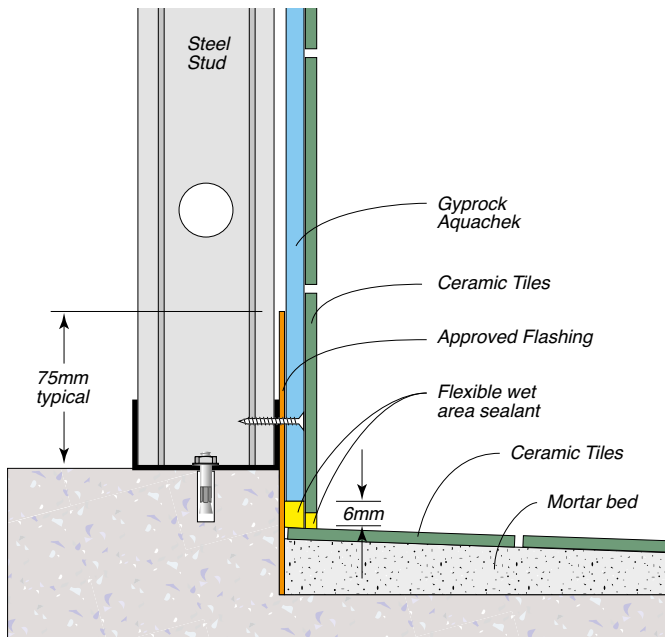
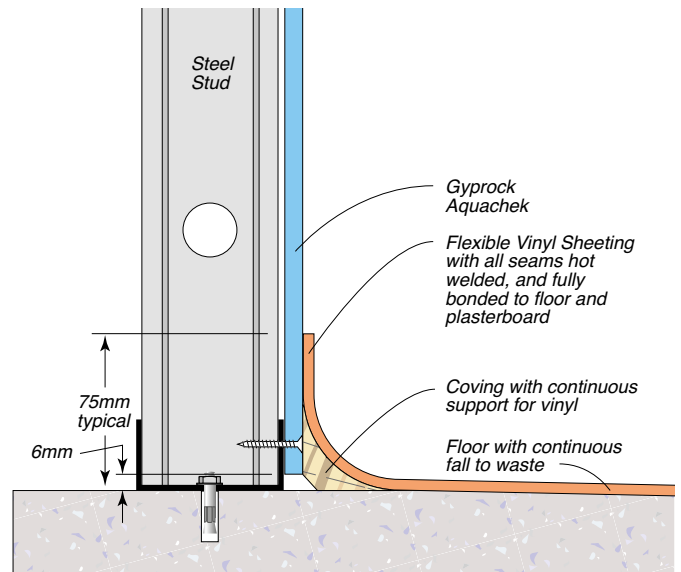


Figure 227: Perimeter Fully Bonded Vinyl Sheetting



# Construction Details – Fire Rated

Appraisal: FC 12946

**IMPORTANT:** Refer to the Components section for requirements on Wet Area Jointing. For details on the treatment of penetrations refer to “Junctions & Penetrations – Fire Rated” on page 78

Figure 228: In situ Formed Shower Recess Ceramic Tiled – Single Layer Gyprock Moisture Resistant Fire Grade Plasterboard

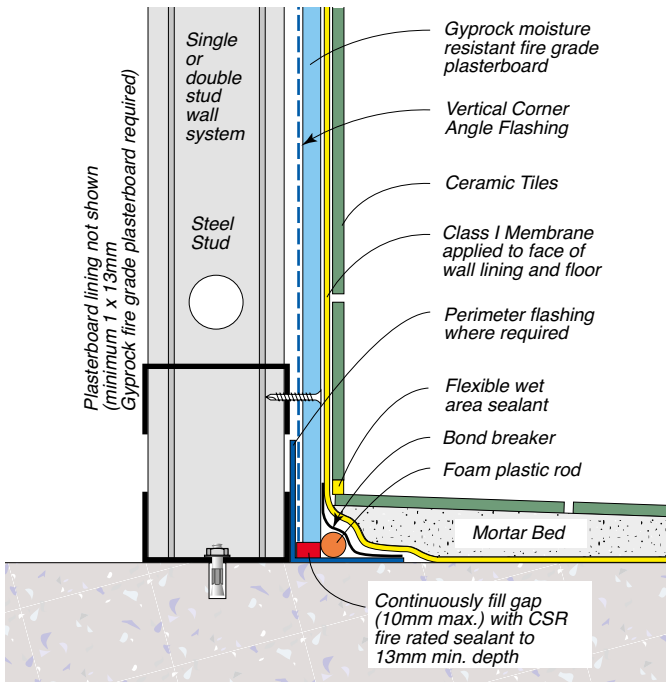


Figure 230: Preformed Shower Base

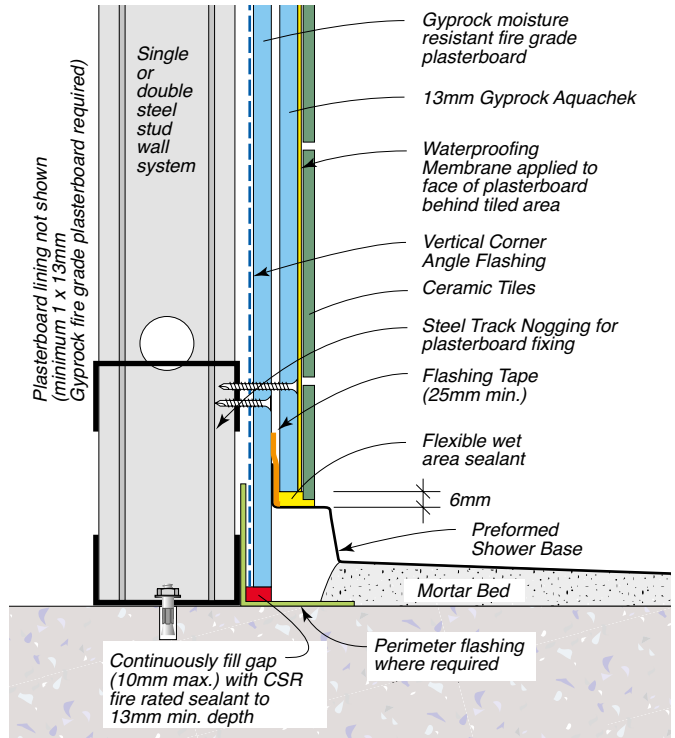


Figure 229: In situ Formed Shower Recess Ceramic Tiled – Double Layer Gyprock Moisture Resistant Fire Grade Plasterboard

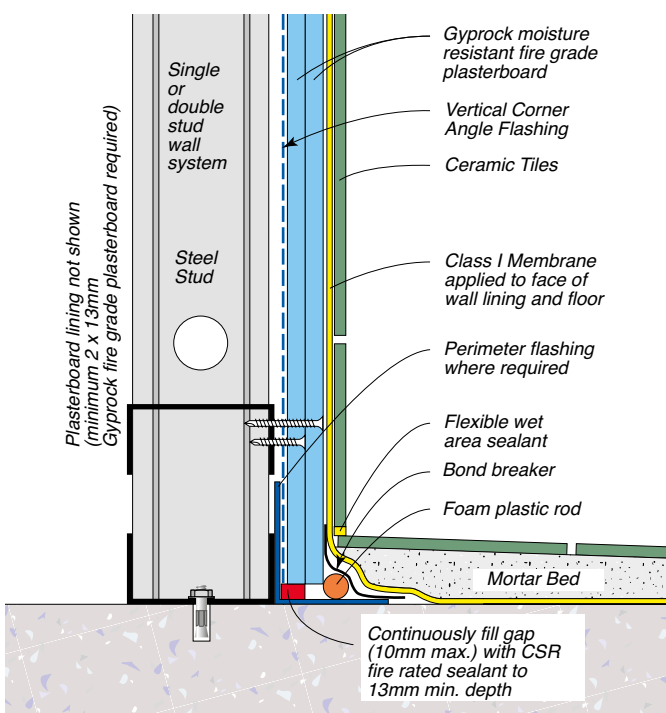


Figure 231: Bath Installation

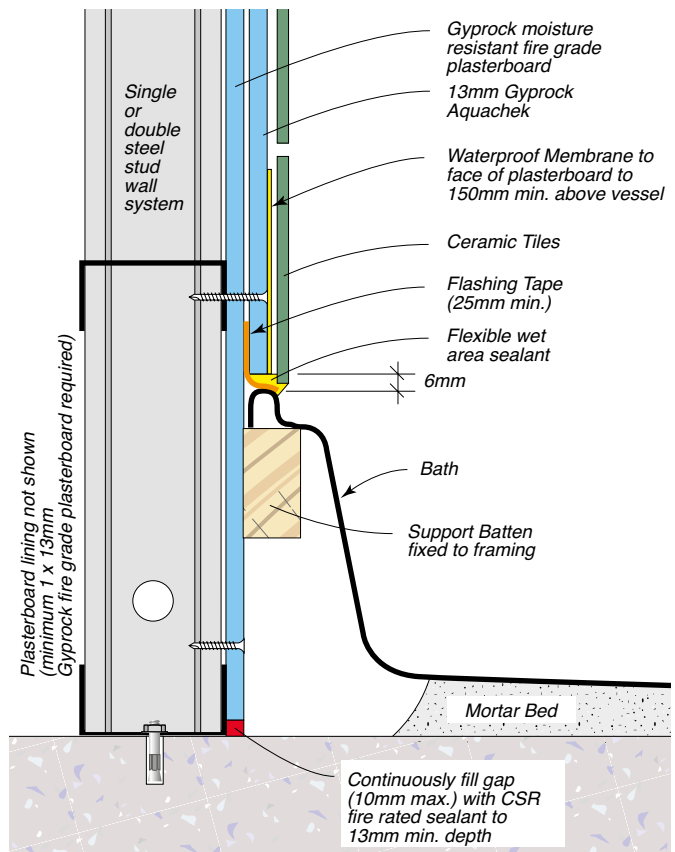


Figure 232: Internal Corner In Shower Recess – Class 1, 2 or 3 Membrane

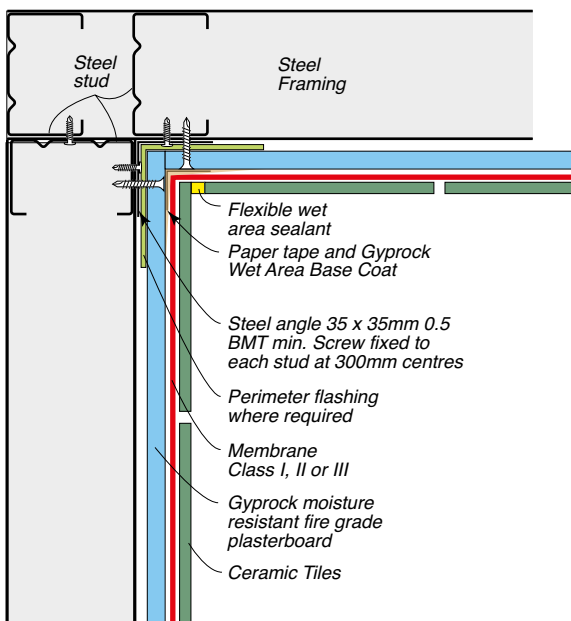
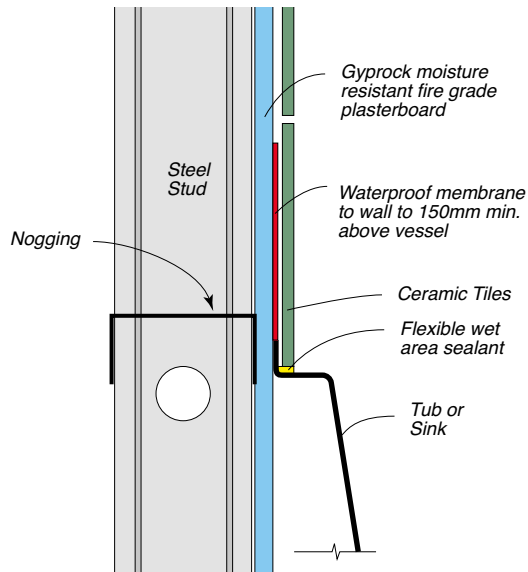


Figure 233: Laundry Tub/Sink Installation



General Wet Areas

Figure 234: Perimeter In situ Membrane

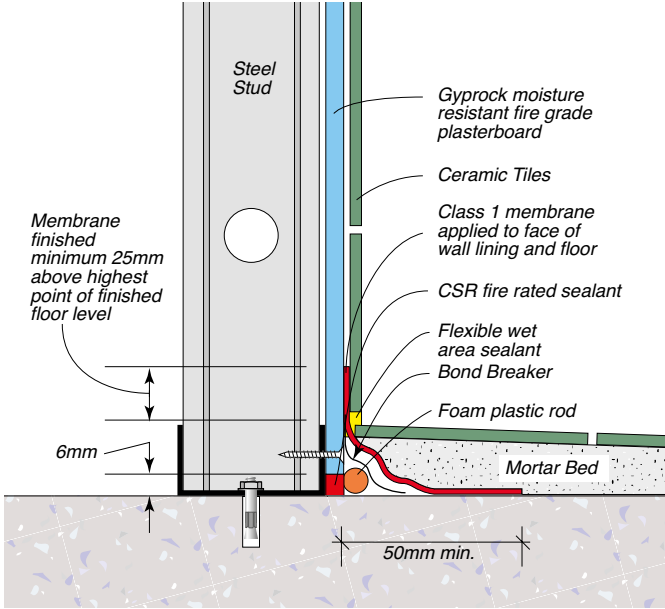


Figure 236: Perimeter Angle Flashing

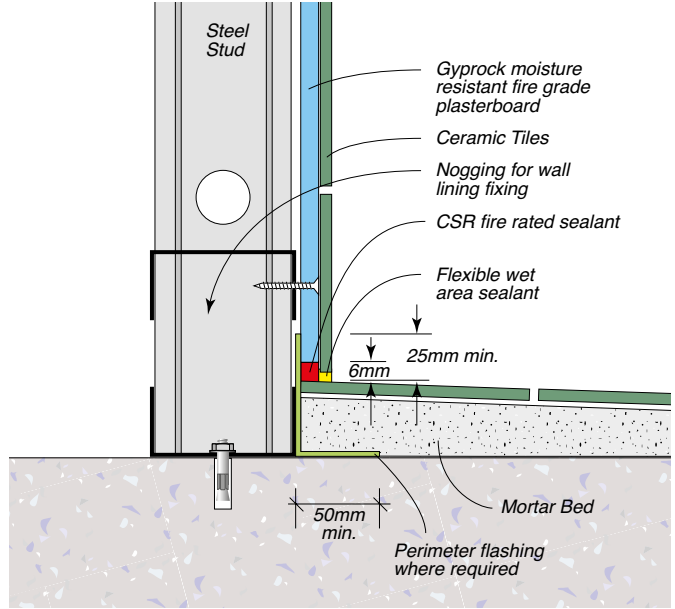


Figure 235: Hob Or Set-Down Slab And Perimeter Flashing

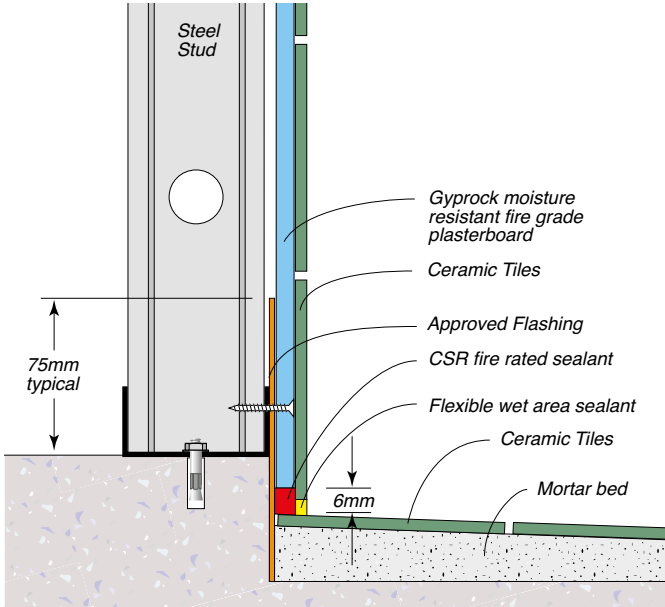
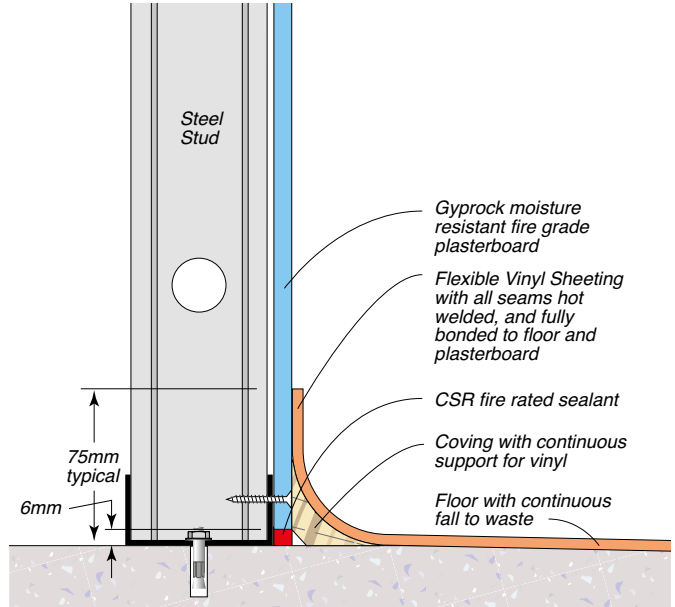


Figure 237: Perimeter Fully Bonded Vinyl Sheetting



# Flush Jointed Ceiling Systems



## Introduction

CSR Gyprock has developed a wide range of Flush Jointed Ceiling Systems for decorative applications, as well as a large selection of ceiling systems to meet specific fire and acoustic requirements.

Gyprock Flush Jointed Ceiling Systems utilise Gyprock plasterboard sheet which is fixed to appropriately prepared framing. Plasterboard joints are taped and set to form a smooth flush jointed continuous ceiling suitable for painting.

CSR also offers a large range of Tile Ceiling Systems for commercial applications. Please refer to the Tile Ceiling Systems section of this guide for additional information.

## Applications

Gyprock Flush Jointed Ceiling Systems are suitable for virtually all interior commercial ceiling applications and can be installed under roof or floor framing.

Where a Level of Finish is specified, refer to the Design & Installation section for additional framing and fixing requirements.

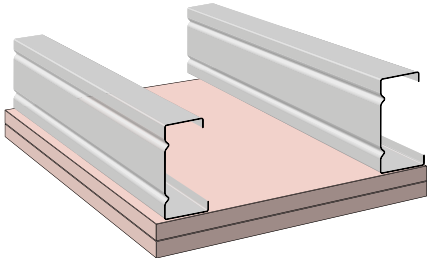
Specific ceiling systems are available for decorative, acoustic and/or fire rated applications.

## Advantages

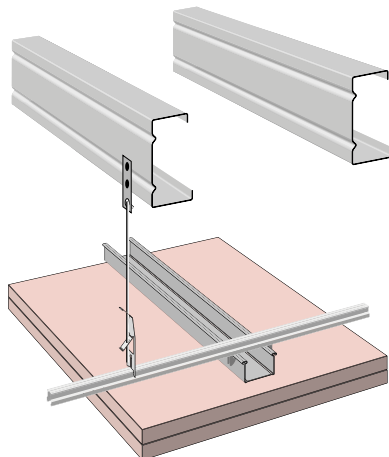
- Flush jointing gives a smooth, seamless, easily decorated finish.
- Systems available for decorative, acoustic rated and fire rated application.
- Suitable for use under a wide range of roof and floor structures.
- Permit flexible location of internal non-loadbearing walls.
- Surface or flush mounted light fittings can be used.
- Fire rated ceilings provide protection for services mounted above the ceiling, and can accommodate air conditioning ducts and dampers, bulkheads and access panels.

# Overview of Flush Jointed Ceiling Systems

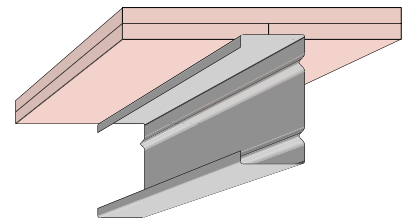
Gyprock Flush Jointed Ceiling Systems utilise various framing formats and plasterboard fixing techniques. Gyprock plasterboard which is fixed to the framing is jointed using tape and compounds to CSR Gyprock specifications to form smooth ceiling surfaces for decorative coating.



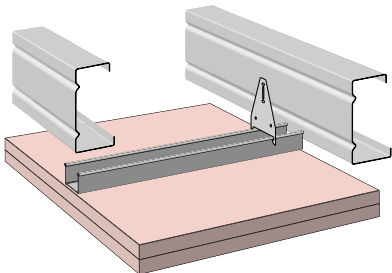
*Plasterboard adhesive and/or fastener fixed directly to steel floor/ceiling joists*



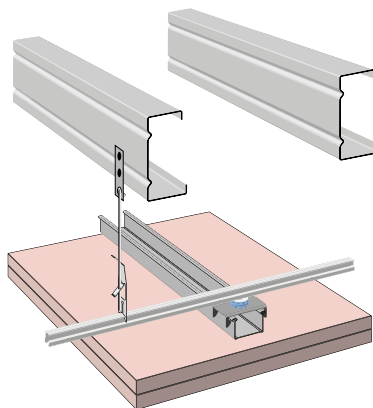
*Plasterboard screw fixed to suspended concealed metal grid (without resilient mounts) under masonry or steel floor/ceiling joists*



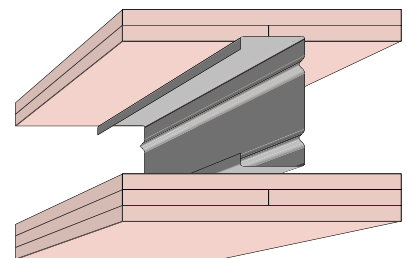
*Plasterboard screw fixed above Lipped Steel C-Stud*



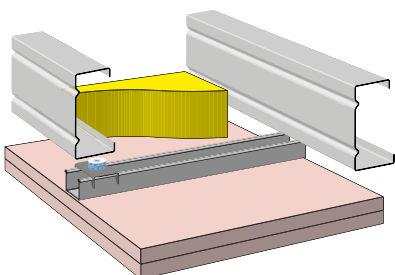
*Plasterboard screw fixed to steel furring channel attached with appropriate fixing clips to masonry or steel floor/ceiling joists*



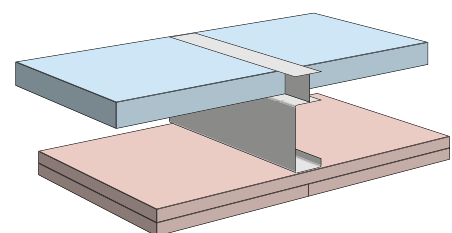
*Plasterboard screw fixed to suspended concealed metal grid (with resilient mounts) under masonry or steel floor/ceiling joists*



*Plasterboard screw fixed above and below Lipped Steel C-Stud*



*Plasterboard screw fixed to resilient mounted furring channel or resilient furring under masonry or steel floor/ceiling joists*



*Plasterboard screw fixed under C-H studs with Gyprock Shaft Liner Panel fitted to framing above*



## Design & Installation Considerations

CSR has developed a wide range of floor/ceiling and roof/ceiling systems to meet specific fire and acoustic requirements. The systems include ratings for sound transmission, sound impact and sound absorption, for fire resistance up to FRL 120/120/120, and for up to 60 minutes Resistance to Incipient Spread of Fire (RISF).

Generally, the fire resistance of floor and roof/ceiling systems is assessed from below, in accordance with the standard fire test of AS1530.4. This is the requirement of the BCA where lightweight construction is used for compartmentation and separation. Some elements such as fire-isolated passageways are required to have an FRL when tested from outside. A number of ceiling systems are available that offer fire resistance from above to meet this requirement.

### Structural

All floor, roof and ceiling framing must be designed for the applied loads. CSR recommends a minimum design pressure of 0.25kPa (downward) for the ceiling framing. Other wind pressures may be applicable; the designer should refer to AS/NZS1170.

Ceiling systems may also be required to resist seismic loads. Refer to the project engineer for details. Rondo has a range of solutions for seismic details that may be suitable.

Tall residential buildings often have exterior operable doors and windows, resulting in internal areas being subject to wind pressure. In these cases, ceilings must be designed for the appropriate loads.

Fixing details for ceiling linings are set out in the general installation diagrams at the back of this section. These details are suitable for the framing centres and pressures as set out in Table 7. The applicable design pressures must be confirmed by the project engineer.

Wind loads on external ceilings can be similar to those on adjacent walls. Pressures can be positive or negative and the lining, grid and structure should be designed to resist the loads. Internal suspension components, even with down struts, may not be suitable.

The maximum spacing of ceiling framing is 600mm. Spacing is dependent on wind pressures, and may be reduced for some lining materials or humidity conditions, and for some FRLs. Refer to Table 34 on page 145 and to Ceiling Systems in Book 1 Design Guide – Fire, Acoustics and Thermal.

Steel framing for direct fixing of linings shall have a maximum base metal thickness (BMT) 1.6mm. Framing may be trusses, top hats, C sections, furring channels, or similar members. In all cases they should be designed in accordance with AS/NZS4600.

For steel components in external environments, in heavy industrial areas or coastal areas, additional coatings may be required. Refer to AS/NZS2785 for guidance

### Direct-Fix Framing Systems

Ceiling linings may be fixed directly to primary timber or steel framing, or to secondary members such as furring channels and battens.

Timber members to which plasterboard will be fixed must comply with AS1684 Residential Timber-Framed Construction, or be designed in accordance with AS1720.1 Timber Structures: Design Methods.

Steel framing to which plasterboard will be fixed must comply with AS/NZS4600, Cold Formed Steel Structures.

### Suspended Ceiling Systems

Ceiling suspension systems must be designed to AS/NZS2785 Suspended Ceilings – Design and Installation. Ceilings in this manual are not trafficable. Trafficable systems shall be designed in accordance with AS1657 Fixed Platforms, Walkways, Stairways and Ladders.

### Ceilings Rated From Above

Ceiling systems with plasterboard linings on top of joists are not trafficable or intended to be used for storage. The joists should be designed for all imposed loads including construction loads where fixing of sheets is required from above. Appropriate barriers and signage should be installed to prevent access.

### Fire Performance

Gyprock fire rated ceiling systems have been designed with fire protection that protects the framing. This means that no consideration of steel or timber framing design need be given for the fire rating.

To protect structural beams that are entirely within the ceiling space, the structural adequacy component of the ceiling system FRL must be at least equivalent to that required by the structural member. For example, a ceiling system with FRL 90/90/90 provides FRL 90/-/- for a steel beam within the ceiling. Systems are available for beams that are not entirely enclosed.

### Framing And Lining

Plasterboard must be screw fixed only, adhesive is not permitted. Joints in the outer layer of all systems must be set with Gyprock paper tape. As a minimum, a single coat finish may be used.

### Caulking

To attain the specified fire rating, all perimeter gaps and penetrations must be carefully filled to the specified depth with appropriate caulking material. In fire rated systems, to attain

the stated fire rating, use Gyprock Fire Mastic, CSR FireSeal or other tested fire rated material of equivalent or better performance. Refer to Junctions & Penetration section for detailed installation information.

## Acoustic Performance

### Sound Transmission

Sound flanking, the effectiveness of workmanship and caulking, the presence and treatment of penetrations, and the inclusion of structural elements and bridging items, may affect the acoustic performance of ceiling systems. Refer to appropriate material for detailed information.

In non-fire rated systems, to attain the stated sound transmission performance, use Gyprock Wet Area Acrylic Sealant or other tested acoustic sealant. All penetrations should be treated to maintain the acoustic integrity of the system.

### Lights

Recessed lights must be installed so as to prevent damage from temperature rise and to prevent the risk of fire. Refer to AS/NZS 3000.

## Components

### Gyprock Plasterboard

Please refer to the full range of Gyprock plasterboard in the introduction section of this guide, Table 1 on page 5

### Gyprock Cornice

Gyprock Cornice is designed to provide an attractive finish at the junction of the wall and ceiling. It can be used on Gyprock plasterboard, fibrous plaster or cement rendered surfaces.

The cornice is composed of gypsum plaster encased in a strong linerboard.

It is recommended that cornice be attached with Gyprock Cornice Cement unless noted.

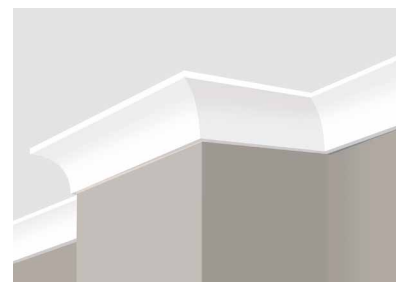
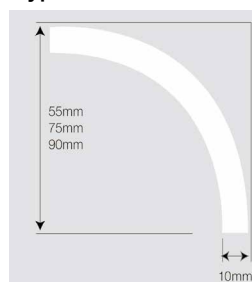
Gyprock cornice sections are available in various lengths. Call your local sales office for lengths stocked in your state.

Table 30: Gyprock Cornice Range

Gyprock Cornice	Applications – Ceiling Systems
	Features
<b>Cove</b>	<p><b>Standard</b></p> <ul style="list-style-type: none"> <li>Gyprock Cove has long been the standard cornice choice for Australian home builders. Its functional profile does not detract from common décor styles and it is available in three profile sizes (55, 75 &amp; 90mm) to suit different ceiling heights and applications.</li> </ul>
<b>Aria™ Duo Presto</b>	<p><b>Contemporary</b></p> <ul style="list-style-type: none"> <li>If the property style calls for something more modern and streamlined than Cove, the Gyprock Contemporary range offers minimalistic profiles that will add interest with simple, fresh appeal.</li> </ul>
<b>Alto™ Trio Tempo™ Concerto™ Symphony</b>	<p><b>Inspirations</b></p> <ul style="list-style-type: none"> <li>A Gyprock Inspirations cornice gives a new dimension of style and detail. Whether traditional or modern in style, each has a unique and distinctive look that can add quality and value to the project.</li> </ul>

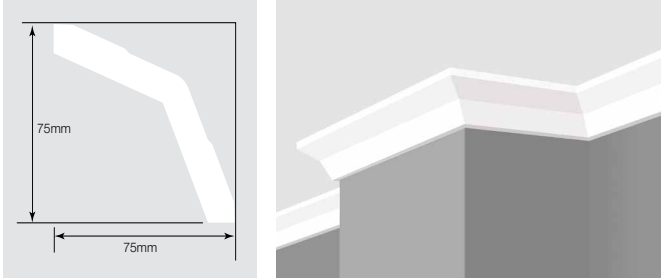
## Cove Range

### Gyprock Cove Cornice



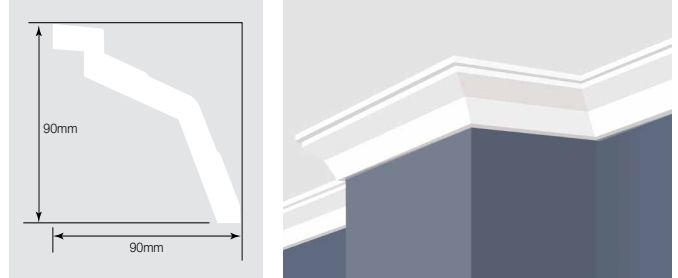
Contemporary Range

Gyprock Aria Cornice

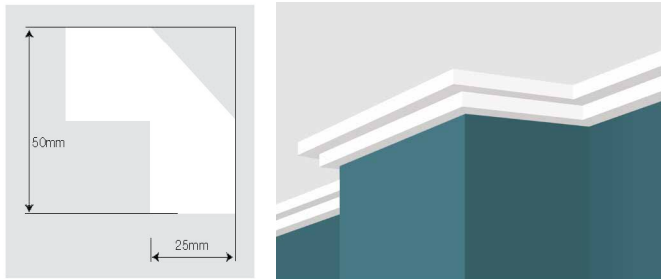


Inspirations Range

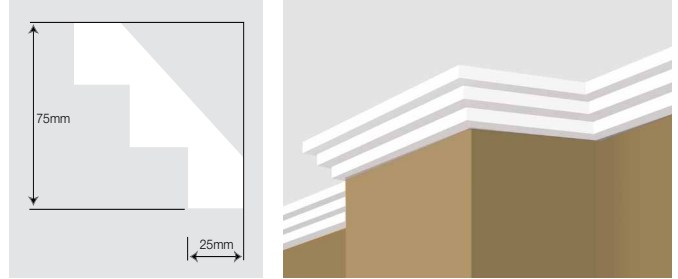
Gyprock Alto Cornice



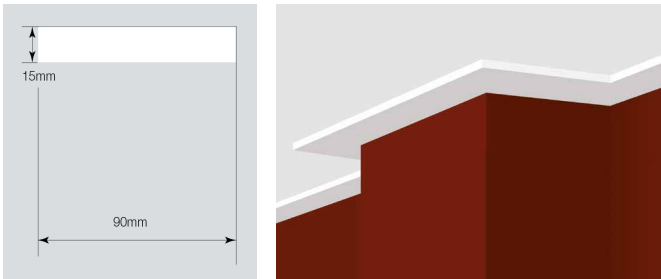
Gyprock Duo Cornice



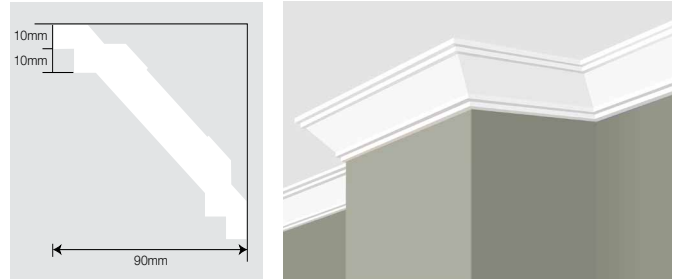
Gyprock Trio Cornice



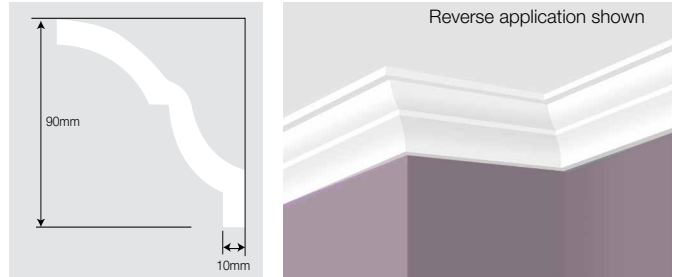
Gyprock Presto Cornice



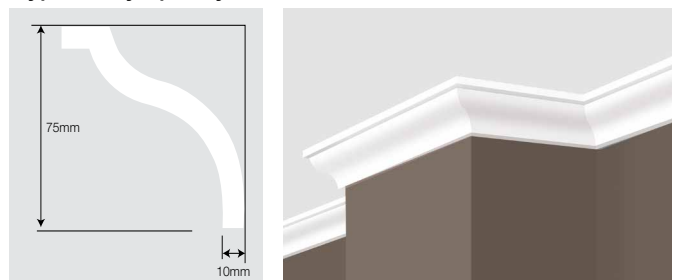
Gyprock Tempo Cornice



Gyprock Concerto Cornice



Gyprock Symphony Cornice



## Gyprock Cornice Cement



## Sheet Fasteners

CSR Gyprock distributes a comprehensive range of fasteners to accommodate most installation applications.

Screws for fixing Gyprock plasterboard to steel framing are detailed in the following tables.

For wet area and external applications, Class 3 fasteners must be used. To guarantee performance, only approved fasteners should be used in these systems.

## Additional Components

For information on steel components, adhesives and mastics, refer to Components in the Walls section of this guide and additional information in the following section.

# Framing Requirements

## Introduction

**Framing requirements detailed in this guide apply to both non-fire rated and fire rated installations.**

This manual details the minimum requirements for various steel framing systems, and recommended installation methods.

Framing must comply with the appropriate requirements detailed in this guide and additional requirements detailed in CSR Gyprock or Rondo Building Services literature current at the time of installation.

It is recommended that the supporting structure be designed for maximum deflection of SPAN/240 under serviceability criteria.

## Steel Framing

Steel framing to which plasterboard will be fixed must:

- comply with AS/NZS4600, Cold Formed Steel Structures.
- be spaced at no more than 600mm centres.
- have a minimum fixing face width of 32mm.
- be no greater than 1.6mm BMT (base metal thickness).
- comply with the following maximum span tables.

## Ceiling Suspension Systems

Gyprock Ceiling Suspension Systems are designed to AS2785 Suspended Ceilings – Design and Installation.

They are not trafficable unless stated, and are designed to carry the weight of the ceiling only.

Where a trafficable ceiling is required, install a proprietary trafficable ceiling system such as Rondo Walkabout.

Table 31: Screw For Fixing Plasterboard To Steel 0.5 – 0.8mm BMT

Plasterboard Thickness	1st Layer	2nd Layer	3rd Layer
6.5mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 25mm NP Screw	
10mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 40mm NP Screw	
13mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 40mm NP Screw	Type S #8-15 x 65mm NP Screw and #10x40mm Laminating Screw
16mm Plasterboard	Type S #6-18 x 30mm NP Screw	Type S #6-18 x 45mm NP Screw	Type S #8-15 x 65mm NP Screw and #10x40mm Laminating Screw
13mm + 16mm Plasterboard	Type S #6-18 x 25mm NP Screw	Type S #6-18 x 45mm NP Screw	

Table 32: Screw For Fixing Plasterboard To Steel 0.8 – 1.6mm BMT

Plasterboard Thickness	1st Layer	2nd Layer	3rd Layer
6.5mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 25mm DP Screw	
10mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 40mm DP Screw	
13mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 40mm DP Screw	*Type S #8-15 x 65mm NP Screw and #10x40mm Laminating Screw
16mm Plasterboard	Type S #6-18 x 30mm DP Screw	Type S #6-18 x 45mm DP Screw	*Type S #8-15 x 65mm NP Screw and #10x40mm Laminating Screw
13mm + 16mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 45mm DP Screw	

NOTE: \* Pilot hole may be required for NP screws.

Strengthen suspension systems to support light fittings and access panels as detailed in the appropriate illustrations in this guide and/or other relevant CSR Gyprock or Rondo technical literature.

Any additional loads are not to be placed upon, or carried by the suspension system.

### Corrosion Protection

For steel components in external environments, in heavy industrial areas or within 1km of the coast, additional coatings may be required. Refer to AS2785 for guidance.

### Control Joints

The continuity of lining sheets and support framework should be broken at control joints.

Control joints may be positioned to intersect light fixtures, heating vents and air diffusers.

Control joints are to be installed in both fire rated and non-fire rated ceilings:

- To coincide with control joints in the supporting frame.
- At changes of framing type or framing direction.
- In continuous interior ceiling areas lined with plasterboard, spaced at no more than 12m centres in both directions.

Refer to Junctions & Penetrations for appropriate details.

Table 33: Maximum Spans For Metal Batten/Furring Channel Used In Ceilings

Gyprock Plasterboard Layers x Thickness	N°581* Resilient Furring		N°308* Furring Channel		N°129* Furring Channel	
	Spacing of Furring		Spacing of Furring		Spacing of Furring	
	450	600	450	600	450	600
	Maximum Permissible Spans for Metal Batten/Furring					
1 x 10mm all products except Plus and Soundchek	600	600	1000	900	1550	1400
1 x 10mm Gyprock Plus Plasterboard	600	–	1000	–	1550	–
1 x 10mm Soundchek 1 x 13mm all products	600	600	1100	1000	1550	1400
1 x 16mm Gyprock plasterboard – all types	600	600	1100	1050	1550	1400
2 x 13/16mm Gyprock plasterboard – all types	600	600	1100	900	1400	1300
3 x 16 Gyprock plasterboard – all types	–	–	900	800	1300	1200

NOTE: Furring to be continuous over 2 or more spans. Dead load deflection Span÷360. \* Includes Internal UDL of 0.25kPa.

Table 34: Maximum Framing Centres For Plasterboard Linings On Ceilings – Based On Wind Loads

Linings	Room Conditions	Wind Load (kPa) Ult.			
		0.25	0.50	0.75	1.00
		Max. Framing Centres (mm)			
10mm Gyprock Plus	Low humidity	450	450	450	450
	High humidity	450	450	300	N/A
Other 10mm Gyprock plasterboard	Low humidity	600	600	600	450
	High humidity	450	450	450	450
13mm Gyprock plasterboard	Low humidity	600	600	600	450
	High humidity	600	450	450	450
16mm Gyprock plasterboard	Low humidity	600	600	600	600
	High humidity	600	600	600	600

- Includes an allowance for up to 5kg/m<sup>2</sup> insulation
- Low humidity includes air conditioned spaces
- High humidity includes non-air conditioned spaces

### Steel Furring Channel Direct Fixed to Framing

Gyprock plasterboard may be fixed directly to steel furring which is held by appropriate direct fixing clips attached to a structural support as shown in adjoining details.

Direct fixing clips provide some vertical adjustment to enable accurate levelling of the furring. After levelling, the brackets should be permanently fixed in place by two nails/screws.

Furring channels then snap fit into the clips.

The ceiling drop should be limited to 200mm maximum with these attachment systems.

Install brackets to ensure there is a clearance between joist and furring of 10mm minimum.

A system comprising N°129 furring channel spaced at 600mm centres and with fixing clips at 1200mm maximum centres can support a maximum of 3 layers x 16mm Gyprock fire grade plasterboard and lightweight insulation.

Refer to span tables in this guide and Rondo Building Services specifications for alternative grid span and spacing information.

Figure 238: Steel Furring Channel Direct Fixing Methods

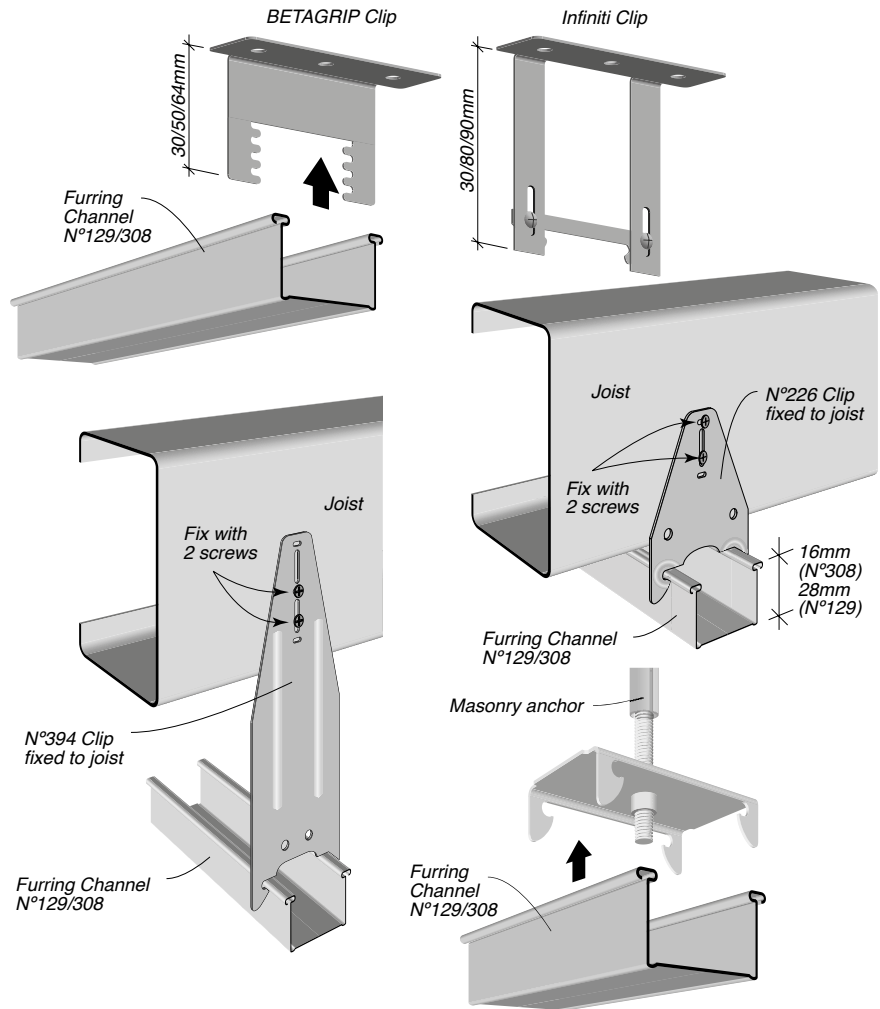
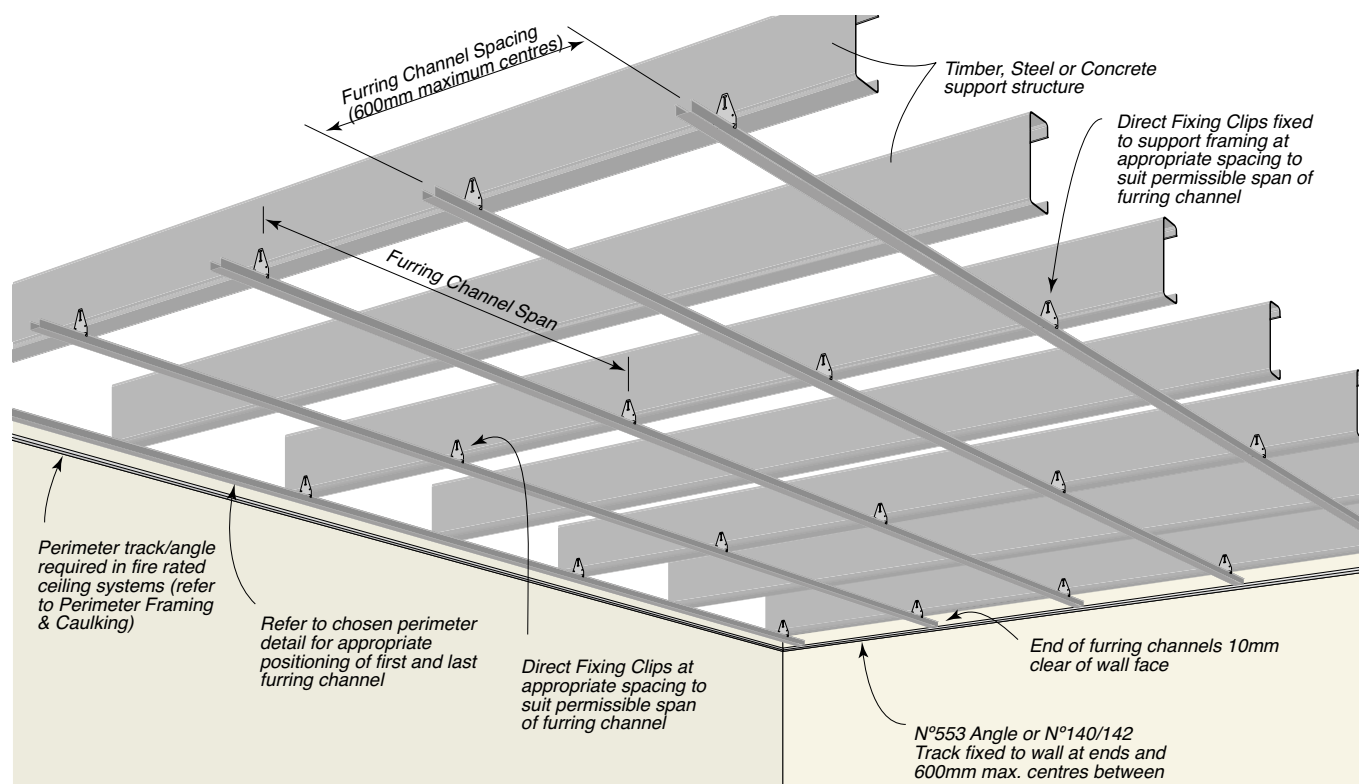


Figure 239: Steel Furring Channel Direct Fixed To Framing





## Steel Furring Channel on Resilient Mounts

The Gyprock Resilient Mount may be screw fixed directly to the underside of joists or trusses using (50mm x N°8 screws for timber) or (30mm x N°8 screws for steel).

Should the joists or trusses be uneven, the adjustable direct-fix bracket (N°CSR4) should be fixed to the side of the framing as detailed in Figure 240. This will provide up to 20mm height adjustment for levelling purposes. After levelling, the bracket should be permanently fixed in place with two nails/screws.

The resilient mount may then be screw fixed to the adjustable bracket (N°CSR4) using a 40mm x N°6 screw.

The furring channels then snap fit into the anchor clips.

The Gyprock Resilient Mount is designed to support a maximum ceiling load of 27kg per mount, and must be installed at appropriate centres to suit the chosen ceiling system and total ceiling mass.

A system comprising N°129 furring channel spaced at 600mm centres fitted with Gyprock Resilient Mounts at 1200mm centres maximum along the furring channel, can support a maximum of 3 layers x 16mm Gyprock fire grade plasterboard and lightweight insulation.

Refer to span tables in this guide and Rondo Building Services specifications for alternative grid span and spacing information.

Figure 240: Gyprock Resilient Mount Fixing

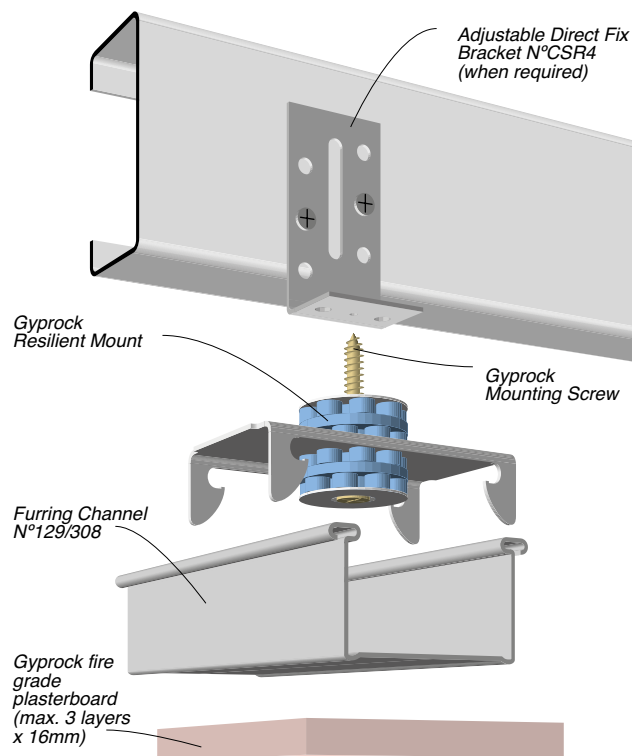
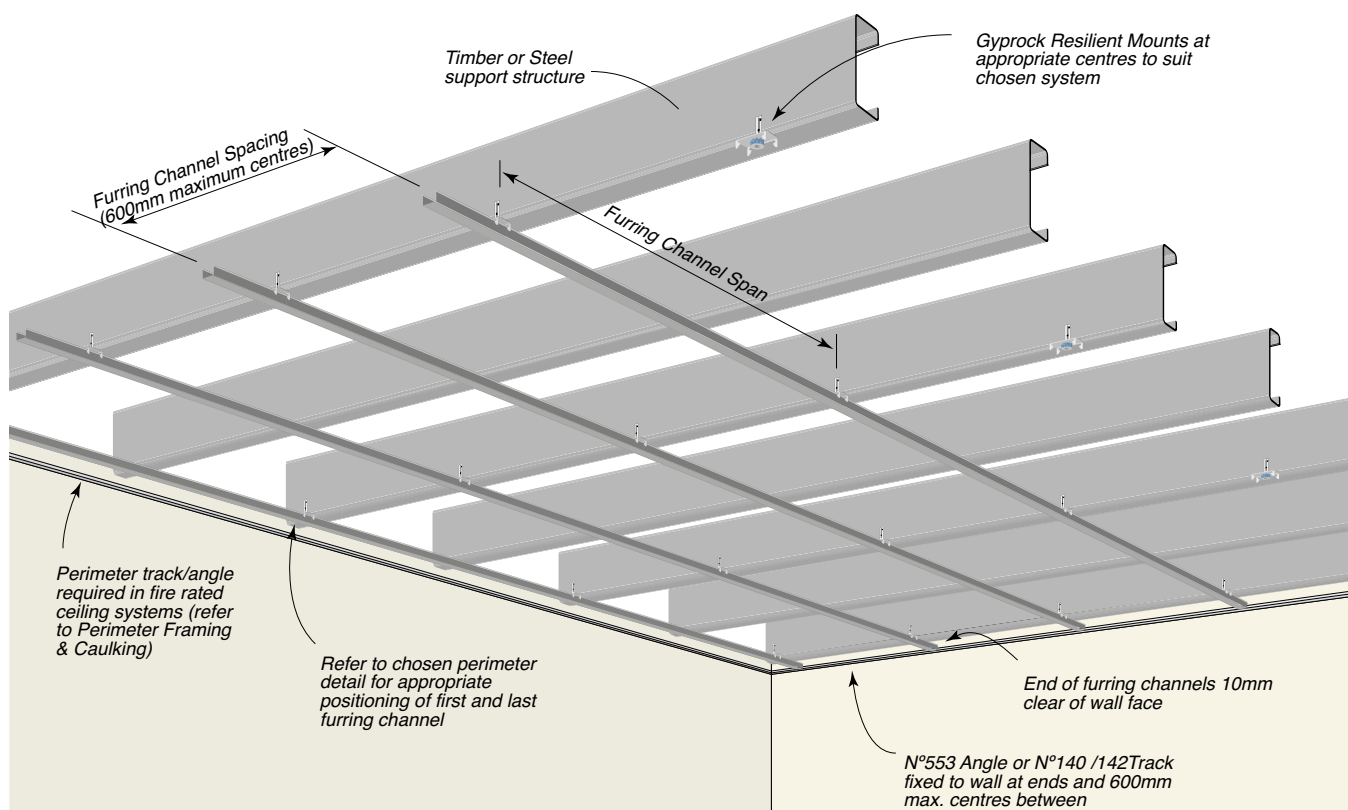


Figure 241: Steel Furring Channel Fixed With Resilient Mounts To Framing



## Concealed Grid Suspended Ceiling

Gyprock plasterboard may be fixed directly to steel furring which is part of a concealed grid suspended ceiling frame as detailed in the following illustration.

These systems are NON-TRAFFICABLE and are not designed to resist the weight of foot traffic. Where access to the ceiling area is required, install a Rondo Walkabout Ceiling System.

Gyprock Suspended Ceiling Systems comprise suspension brackets fixed to the supporting structure, suspension rods, suspension clips, top cross rails, and a locking key or Gyprock Resilient Mount for coupling to the furring channel. Refer to Suspended Ceiling Components.

Where Top Cross Rails are not continuous, they must be joined as shown in the suspended ceiling components details. Joins must be aligned with hanging points.

Where Furring Channels are not continuous, they must be joined as shown in the suspended ceiling components details.

Where the Gyprock Resilient Mount is used, it is designed to support a maximum ceiling load of 27kg per mount, and must be installed at appropriate spacing to suit the chosen ceiling system and total ceiling mass.

A system comprising N°128 Top Cross Rails at 1200mm maximum spacings, suspension points at 1200mm maximum centres, N°129 furring channel at 600mm maximum spacings (with or without Gyprock Resilient Mounts) can support up to 3 layers of 16mm Gyprock fire grade plasterboard and lightweight insulation.

No provision has been made for the support of services or lighting systems. Adequate independent or additional support must be provided for services and lighting systems. Refer to Grid Installation in this guide and Rondo Building Services specifications.

Refer to span tables in this guide and Rondo Building Services specifications for alternative grid span and spacing information.

Figure 242: Concealed Grid Suspended Ceiling

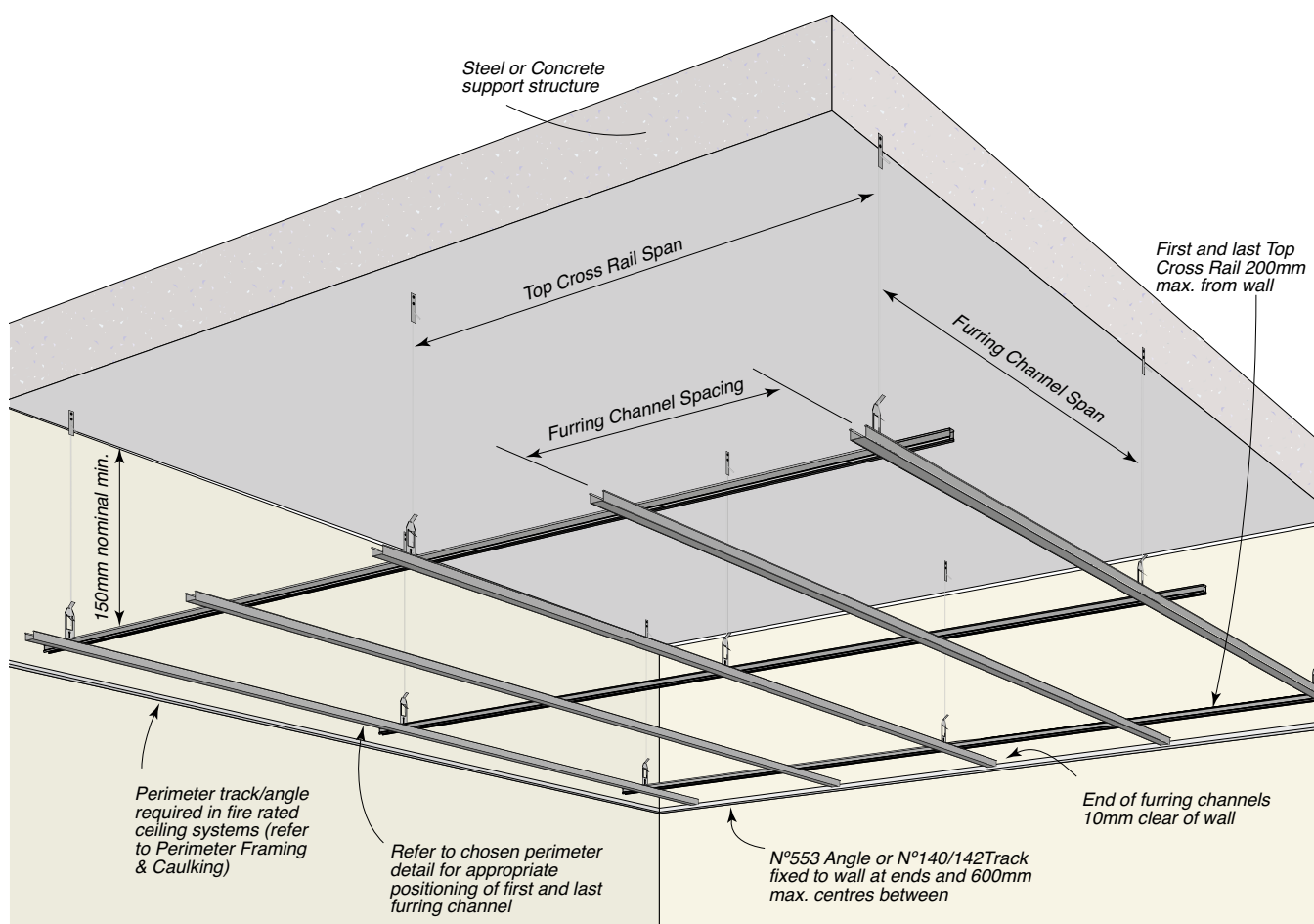
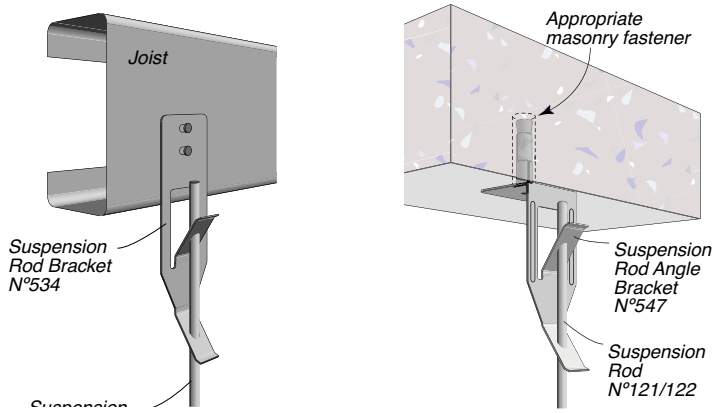
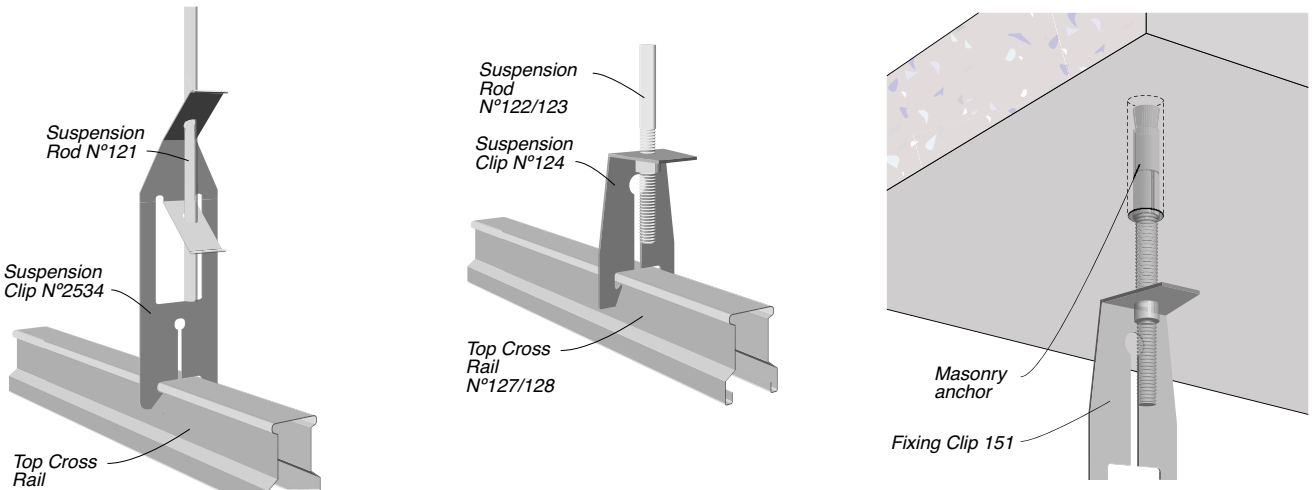


Figure 243: Key-Lock Concealed Grid Suspended Ceiling Components  
(Refer to Rondo Building Services literature for additional information)

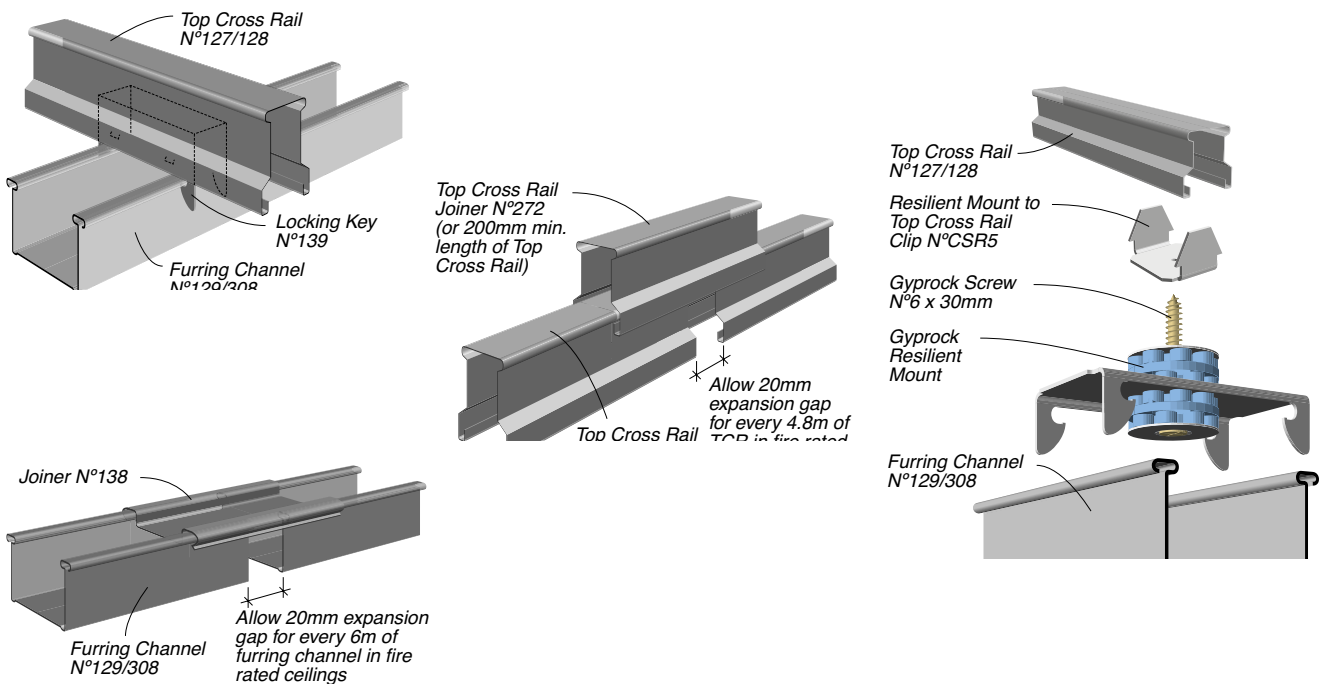
Suspension Brackets



Suspension Clips



Joiners



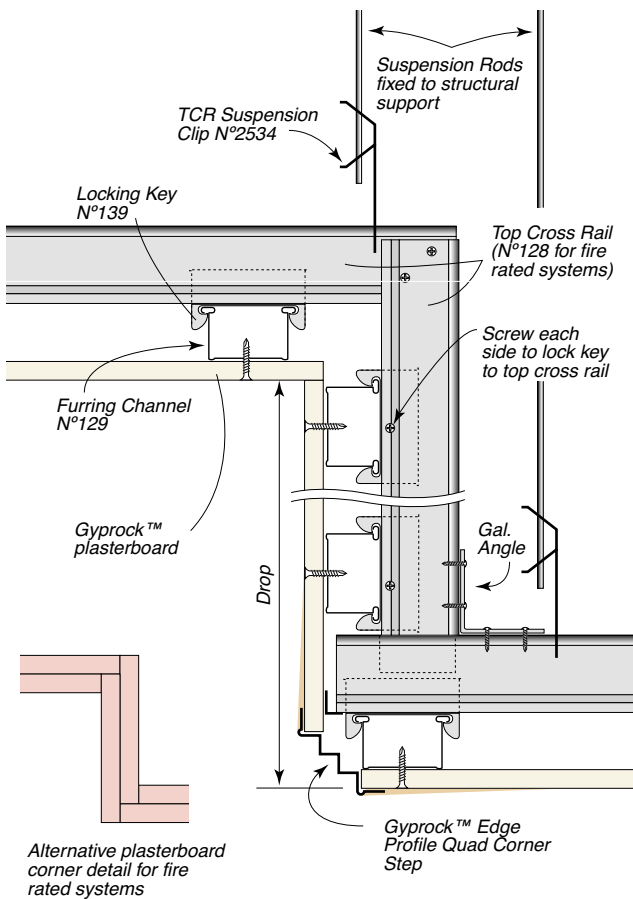
### Bulkheads

Bulkheads require independent support to carry the additional plasterboard and framing members. Depending on the drop and plasterboard mass to be installed, this may be achieved with additional suspension hangers as detailed in Figure 245 and Figure 246, or by fixing framing members directly to the structural supports as detail in Figure 244.

All bulkheads require bracing to provide lateral stability to the framework during incidental loading. This may be achieved by providing stud bracing, fixed diagonally between the bulkhead framework and the structural soffit at regular intervals as shown in Figure 244 or alternatively, by rigidly coupling the ceiling to the bulkhead. If rigid coupling is used, the ceiling must be checked for horizontal loading. Refer to Rondo Building Services for assistance.

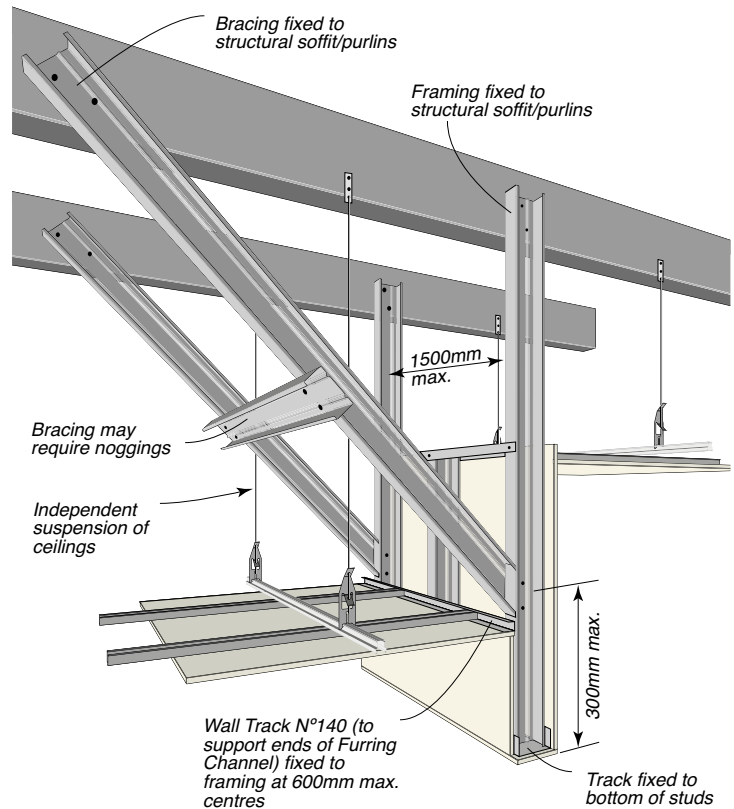
**Figure 245: Suspended Bulkheads**

Drops up to 450mm – up to 3 layers x 16mm Gyprock Plasterboard  
 Drops 450mm to 1200mm – up to 1 layer Gyprock Plasterboard (8.5kg/m<sup>2</sup> maximum).



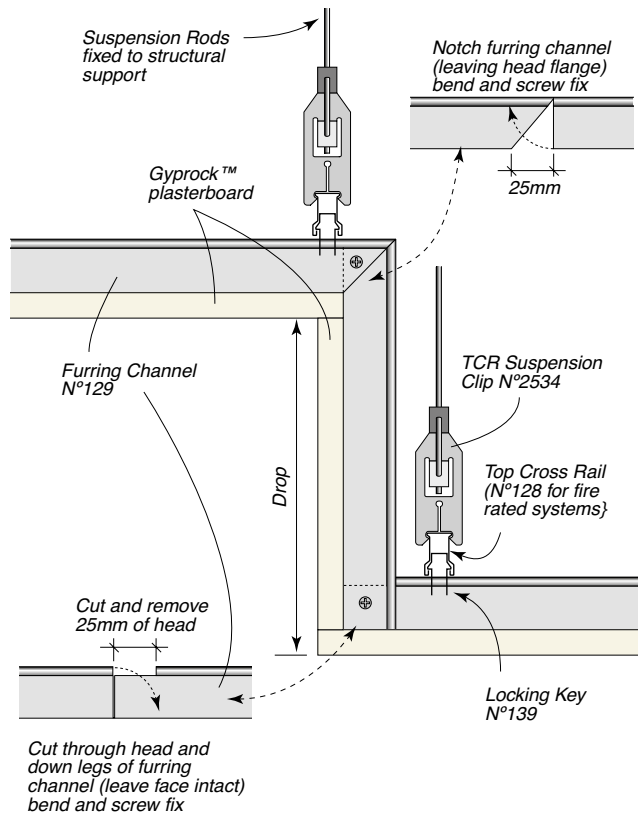
**Figure 244: Bulkhead Detail**

Drops greater than 450mm – up to 3 layers x 16mm Gyprock Plasterboard



**Figure 246: Suspended Bulkheads**

Drops up to 450mm – up to 3 layers x 16mm Gyprock Plasterboard  
 Drops 450mm to 1200mm – up to 1 layer Gyprock Plasterboard (8.5kg/m<sup>2</sup> maximum).



## Curved Ceilings

Gyprock plasterboard may be used on curved installations in accordance with Table 35 and Table 36.

For Gyptone Flexible Plasterboard, refer to the section titled “Gyptone Perforated Ceiling System For Curved Installations”.

Fire rated boards MUST NOT be curved to a radius of less than 3000mm.

Where a radius tighter than 900mm is to be used, the framing should be sheathed with Gyprock Flexible Plasterboard.

**Table 35: Curving Radii And Maximum Frame Spacing For 6.5, 10, 13 And 16mm Gyprock Plasterboard**

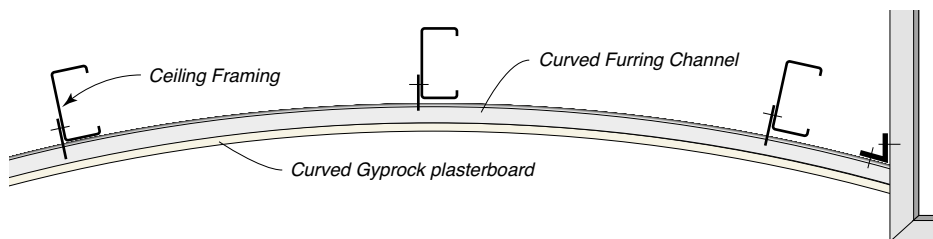
Plasterboard Thickness (mm)	Gyprock Flexible Plasterboard	Gyprock Plus, Standard and Flexible Plasterboard ONLY				All Gyprock Plasterboard (excluding Soundchek and perforated products)	
	Curve Radius (mm)						
	<900	900 – 2000	2001 – 2500	2501 – 3000	3001 – 4000	>4000	
Maximum Framing Spacing (mm)							
6.5	Refer to Table 36	150	300	350	450	550	
10	–	150	300	350	400	500	
13	–	–	250	300	400	500	
16	–	–	–	–	250	350	

**Table 36: Minimum Curving Radii And Maximum Frame Spacing For Gyprock Flexible Plasterboard**

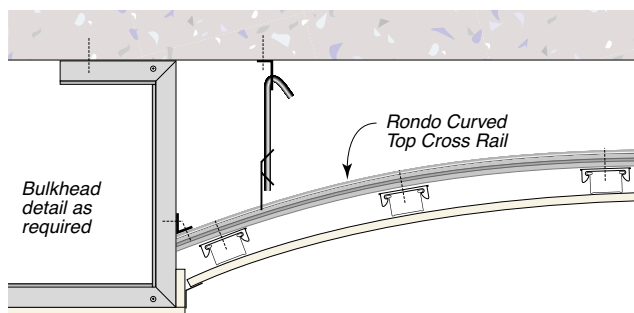
Applications	Sheets Installed Lengthways		Sheets Installed Widthways	
	Minimum Radius	Max. Stud Spacing	Minimum Radius	Max stud Spacing
Concave	450mm	150mm	650mm	200mm
Convex	250mm	125mm	450mm	200mm

Notes – Low temperature and humidity will reduce board flexibility.  
 Curved Lengthways = where recessed edges are NOT curved.  
 Curved Widthways = where recessed edges are curved.

**Figure 247: Curved Ceiling Framing**

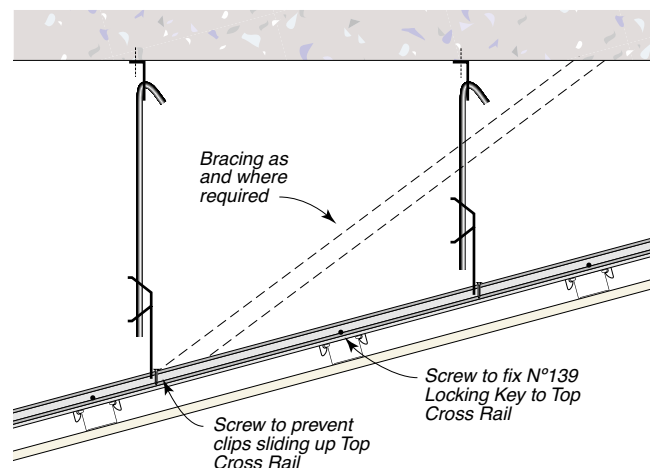


**Figure 248: Curved Ceiling Framing**



## Raked Suspended Ceilings

**Figure 249: Raked Suspended Flush Jointed Ceiling**



# Steel Joist Framed Ceiling Systems

## Introduction

CSR Gyprock has developed a wide range of tested fire and/or acoustic ceiling systems utilising steel framing and plasterboard fixed to one or both sides.

These systems are most commonly specified above stairwells and corridors, and under concrete floors where personnel access is not required.

This section also details methods for constructing isolated bulkheads utilising steel furring channel framing.

## Frame Requirements

Refer to the Framing section for the general requirements on steel frame construction.

**All systems detailed in this section are non-trafficable, and are designed to carry the weight of the ceiling only. The ceiling framing must be strengthened to support light fittings and services.**

## Ceilings Lined One Side

### Joist Selection

Steel joists for ceilings lined one side can be selected based on Table 37, which provides span information for Rondo Lipped Steel Stud sections when used as ceiling joists.

### Joist End Support

Refer to following pages for alternative ceiling joist end support configurations and recommended construction methods.

### Nogging/Bridging

Nogging/bridging is required where joist span exceeds 2.0m.

Refer to Table 38.

### Control Joints

Control joints are to be installed in both fire rated and non-fire rated continuous interior ceiling areas, spaced at no more than 12m centres in both directions.

Refer to Junctions & Penetrations for appropriate details.

### Plasterboard Fixing

Gyprock plasterboard can be installed in any of the methods detailed in this guide which are appropriate for the type of ceiling being constructed. Refer to Plasterboard Fixing details.

### Perimeters & Caulking

Refer to Junctions & Penetrations for appropriate details.

Figure 250: General Layout Of Ceiling Framing For Single Span

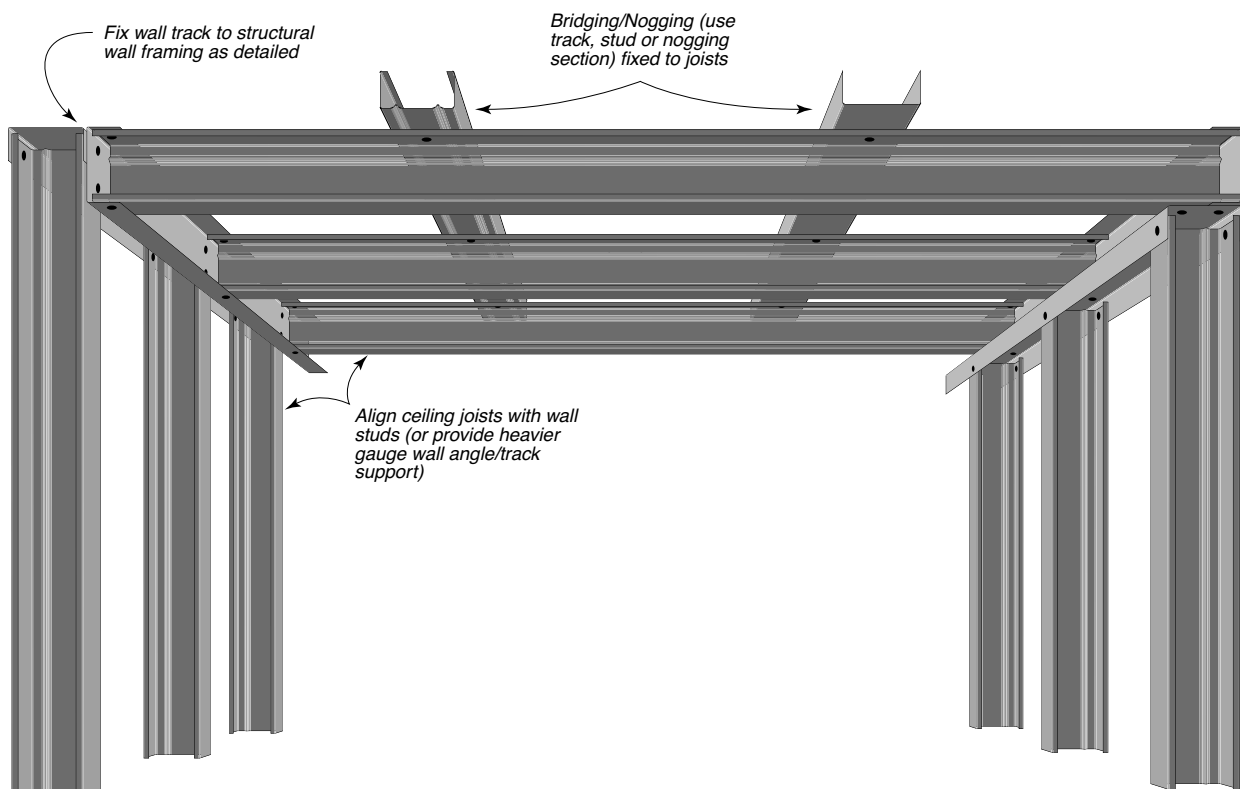




Table 37: Maximum Span Of Joists For Internal Ceilings Single Span – Rondo Lipped Steel Stud Lined One Side – Uniform Distributed Load (UDL) = 0.25kPa.

C-Stud Depth mm	51		64			76			92			150	
Stud Gauge BMT (mm)	0.50	0.75	0.50	0.75	1.15	0.55	0.75	1.15	0.55	0.75	1.15	0.75	1.15
Plasterboard (Layers x mm)	Maximum Span of Joist (mm) – Joist Spacing 600mm												
1 x 10 or 1 x 13	1800	2020	2100	2460	2775	2535	2820	3125	2870	3255	3615	4660	5285
1 x 16	1740	1960	2095	2470	2705	2500	2945	3025	2780	3195	3495	4510	5120
2 x 13	1665	1880	1945	2335	2575	2365	2770	2900	2660	3030	3355	4325	4915
2 x 16 or 16 + 13	1580	1780	1860	2235	2450	2235	2650	2760	2525	2875	3190	4115	4675
3 x 16	1470	1655	1620	2060	2265	2045	2440	2545	2350	2650	2965	3715	4300
	Maximum Span of Joist (mm) – Joist Spacing 450mm												
1 x 10	2010	2260	2350	2695	3035	2780	3090	3480	3210	3565	4020	5190	5860
1 x 13	1975	2220	2305	2760	3045	2845	3265	3415	3165	3605	3975	5095	5760
1 x 16	1910	2150	2305	2690	2960	2760	3200	3310	3050	3505	3845	4935	5585
2 x 13	1830	2060	2140	2550	2820	2615	3015	3175	2920	3330	3680	4740	5370
2 x 16 or 16 + 13	1735	1950	2080	2440	2690	2480	2895	3020	2775	3170	3495	4505	5115
3 x 16	1605	1810	1760	2260	2490	2280	2670	2780	2580	2930	3250	4150	4700
	Maximum Span of Joist (mm) – Joist Spacing 300mm												
1 x 10	2290	2570	2675	3060	3430	3160	3505	3930	3650	4040	4535	5865	6580
1 x 13	2250	2520	2625	3105	3430	3145	3585	3745	3520	3970	4370	5585	6285
1 x 16	2175	2440	2620	3030	3340	3145	3585	3745	3520	3970	4370	5585	6285
2 x 13	2085	2340	2435	2880	3190	2980	3390	3600	3355	3780	4185	5370	6055
2 x 16 or 16 + 13	1980	2230	2375	2755	3045	2845	3255	3430	3175	3605	3985	5115	5775
3 x 16	1830	2055	2200	2560	2830	2625	3020	3150	2940	3345	3700	4700	5285

NOTES:

1. Maximum deflection = Span÷360 or 12mm.
2. Nogging/bridging required for wall over 2m height (equally spaced) – Refer to Table 38.
3. For alternative spans using boxed studs or multispan configurations, refer to Rondo Building Services.
4. Strength check  $1.2G + W_u$ , using  $W_u = 0.375kPa$ .
5. Serviceability check  $G + W_s$  Limit  $L/360$  or 12mm,  $G$  Limit  $L/600$ .
6. Support and Connections to be independently checked.
7. The live load in accordance with AS/NZS 1170.1 2002 clause 3.5.2 has not been applied to the ceiling joists. Accordingly, personnel are not permitted to traffic the ceiling joists.
8. Maximum span tables assume noggings are equally spaced along joists.

Table 38: Minimum Number Of Bridging/Nogging Rows

Lining Configuration	Joist Span (m)	Number of Noggings/Bridging equally spaced
Lined One Side	0.0 - 2.0	0
	2.0 - 4.0	1
	4.0 - 6.0	2
	6.0 - 7.0	3

## Framing Installation

Refer to the following details for alternative frame assembly methods.

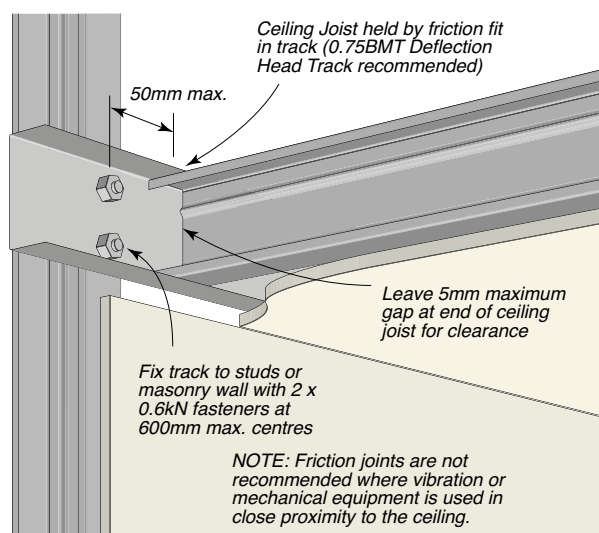
- Install steel track with the lower flange aligned at the required ceiling height and fix at ends and at 600mm max. cts. For masonry, use power driven fasteners, expansion anchors, or easy drive masonry anchors. For steel stud framing, use Gyprock type S Screws, toggle bolts or expandable fasteners. For timber framing, use Gyprock Clouts or Gyprock type W Screws.
- Cut and install ceiling joists (lipped steel stud) into tracks, leaving a 5-10mm gap at each end, (8-15mm for fire rated ceilings). Fix as indicated for the appropriate installation method.

NOTE: For alternative frame construction methods or for multi-span applications, refer to Rondo literature.

Figure 251: Joist End Support – Friction Joint

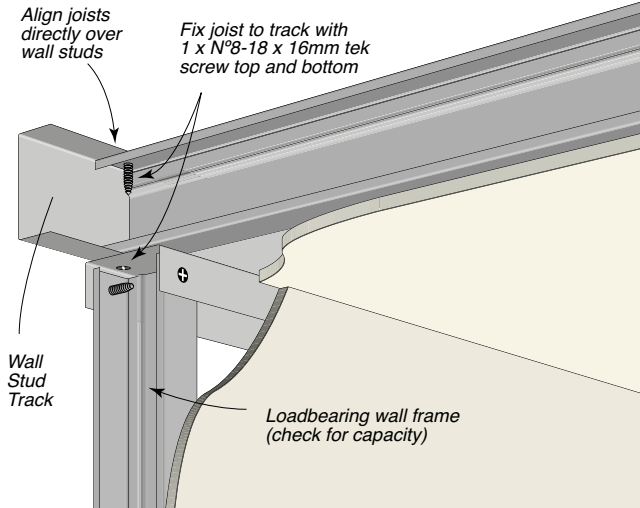
Maximum Joist Span: 2.0m (single span).

Maximum Joist Span: 2.8m (continuous over 2 or 3 spans).



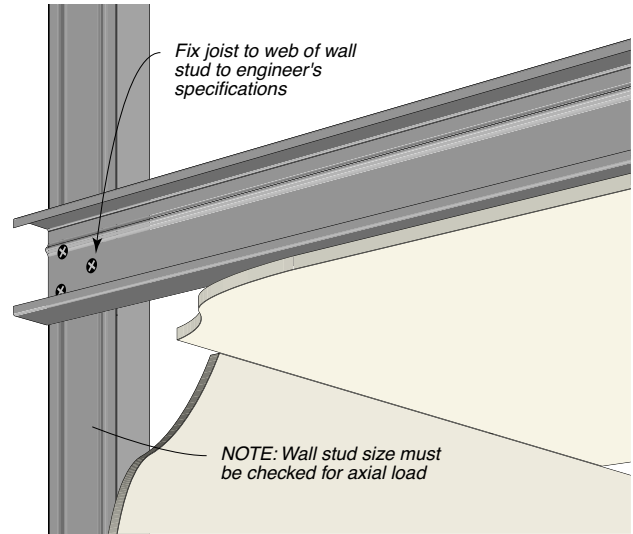
**Figure 252: Joist End Support – Mechanical Joint**

Maximum Joist Span: 3.0m (single span).  
Maximum Joist Span: 4.0m (continuous over 2 or 3 spans).



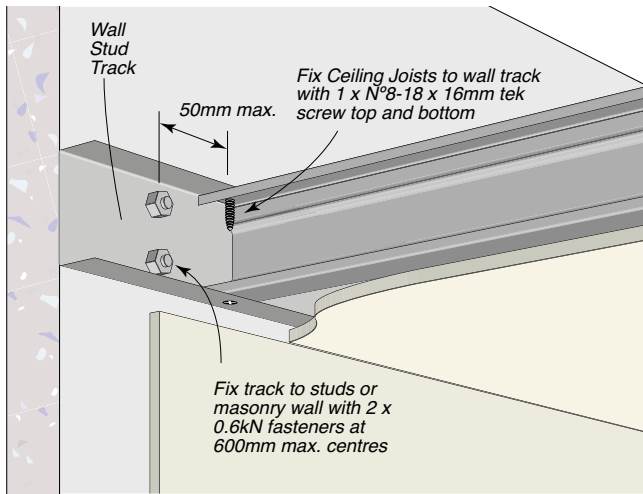
**Figure 255: Joist End Support – Mechanical Joint**

Maximum Joist Span: 6.0m (single span).



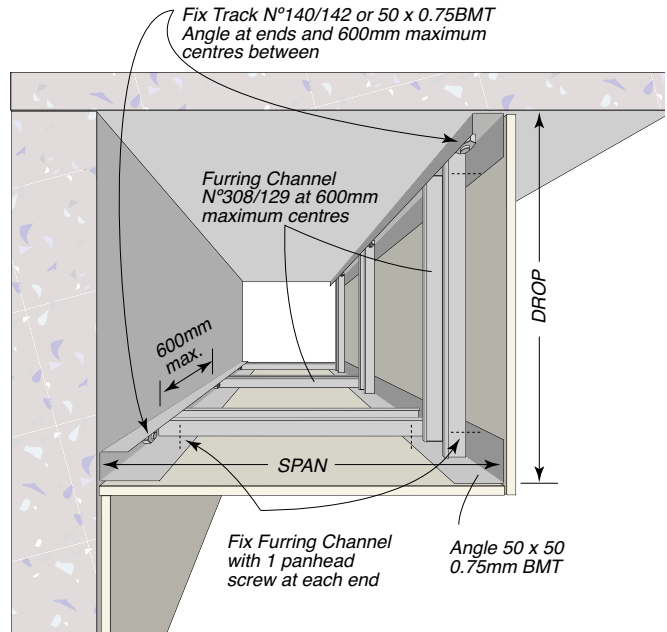
**Figure 253: Joist End Support – Mechanical Joint**

Maximum Joist Span: 3.0m (single span).  
Maximum Joist Span: 4.0m (continuous over 2 or 3 spans).



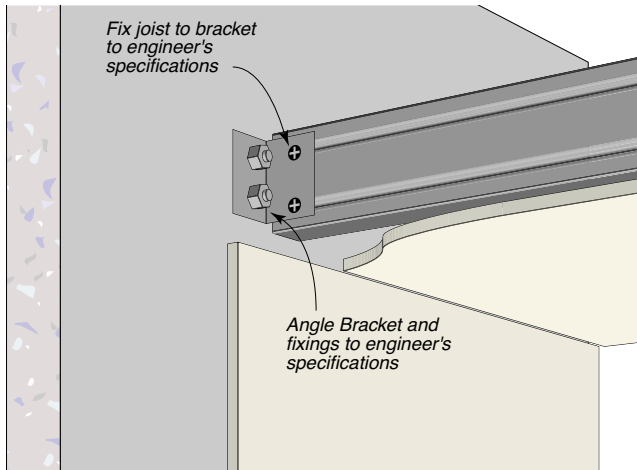
**Figure 256: Bulkhead Construction**

For Maximum SPAN and DROP data, refer to following table.



**Figure 254: Joist End Support – Mechanical Joint**

Maximum Joist Span: 6.0m (single span).



**Table 39: Bulkhead Drop & Span**

Plasterboard Lining	Maximum Drop & Span (mm)	
	Furring N°308	Furring N°129
1 x 10mm	680	1040
1 x 13mm	770	1080
2 x 16mm	710	1000
3 x 16mm	650	890

# Ceilings Lined Two Sides

## Joist Selection

Maximum permissible spans for Rondo Lipped Steel Stud (150mm x 0.75BMT) lined on two sides are detailed in Table 40.

Maximum permissible spans for Rondo C-H Stud profiles lined on two sides are detailed in Table 41.

Alternative steel framing methods are permitted and must be designed by the project engineer. Framing must be at 600mm maximum centres, with a maximum material thickness of 1.6mm BMT.

## Joist End Support

Refer to the following details for alternative ceiling joist end support configurations and recommended construction methods.

Note the specific requirements for the end support construction detailed where the longer spans are chosen.

1.15mm BMT track and 1.5mm angle are non-standard and may require fabrication.

## Nogging

One row of nogging is required mid-span where single lipped C-stud sections are used. Nogging is not required where boxed

lipped C-stud sections are used.

Nogging must also be included at all joints in Gyprock Shaft Liner Panel. Refer to Figure 258.

## Control Joints

Control joints are to be installed in fire rated continuous interior ceiling areas, spaced at no more than 12m centres in both directions, and as detailed in the Framing section earlier in this guide. Refer to Junctions & Penetrations for details.

## Plasterboard Installation

Gyprock plasterboard must be installed and fixed in accordance with appropriate fire rated system details in this guide. Layers applied to the top of the joists must be fixed to fire rated 2 layer system specifications.

Gyprock Shaft Liner Panel should be installed into the C-H Stud profile during frame assembly. Cut the panels 15mm short, install and push hard-up one end. Install 22mm IBS Rod at the other end to seal the gap and allow for expansion. Refer to Figure 258.

## Caulking

Fire rated ceilings lined two sides must have perimeter gaps fully caulked as detailed in Figure 257 or Figure 258.

Figure 257: General Layout Of Lipped C-Stud Ceiling Framing Lined Two Sides

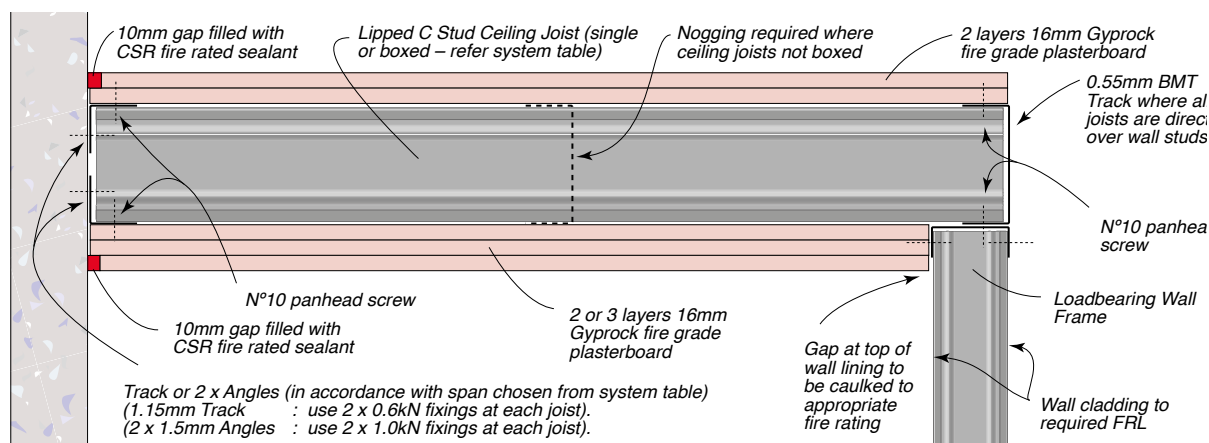


Figure 258: General Layout Of C-H Stud Ceiling Framing Lined Two Sides

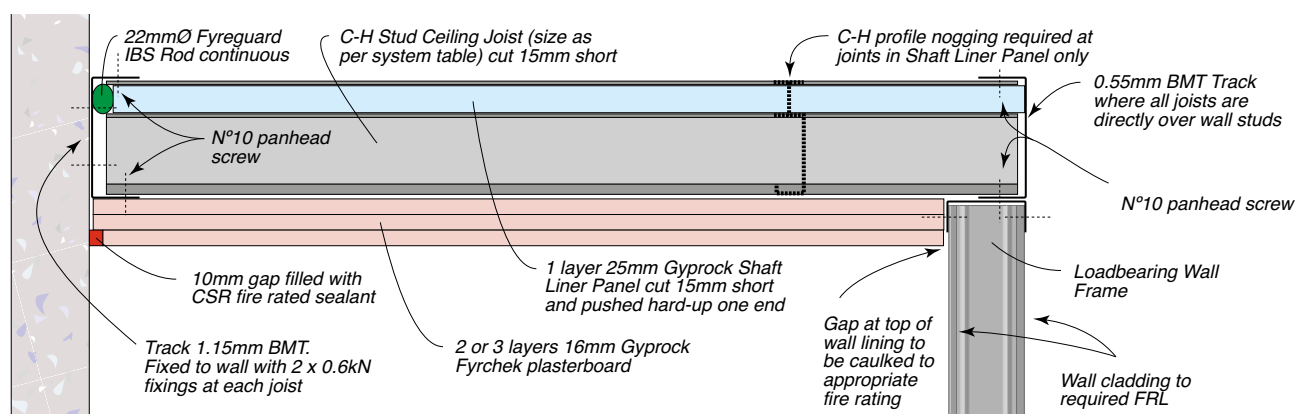


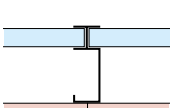
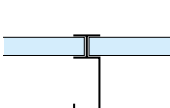
Table 40: Maximum Span Of Ceiling Joists – Rondo Lipped C-Stud (150 X 0.75mm BMT) – Lined Two Sides

System Type	Plasterboard Linings	Ceiling Joist – Single Lipped C-Stud with 1 Row Nogging			
		Ceiling Joist Spacing (mm)	Allowable Span of Joist (mm)		
	Above: 2 x 16mm Gyprock fire grade plasterboard Below: 2 x 16mm Gyprock fire grade plasterboard		600	End Support (Figure 259) 1.15mm BMT Track	End Support (Figure 260) 2 x 1.5mm BMT Angle
		400		2000	3650
		300		2600	4050
System Type	Plasterboard Linings	Ceiling Joist – Boxed Lipped C-Studs with No Nogging			
		Ceiling Joist Spacing (mm)	Allowable Span of Joist (mm)		
	Above: 2 x 16mm Gyprock fire grade plasterboard Below: 2 x 16mm Gyprock fire grade plasterboard		600	End Support (Figure 259) 1.15mm BMT Track	End Support (Figure 260) 2 x 1.5mm BMT Angle
		400		2000	4350
		300		2600	4750
System Type	Plasterboard Linings	Ceiling Joist – Single Lipped C-Stud with 1 Row Nogging			
		Ceiling Joist Spacing (mm)	Allowable Span of Joist (mm)		
	Above: 2 x 16mm Gyprock fire grade plasterboard Below: 3 x 16mm Gyprock fire grade plasterboard		600	End Support (Figure 259) 1.15mm BMT Track	End Support (Figure 260) 2 x 1.5mm BMT Angle
		400		1800	3500
		300		2300	3900
System Type	Plasterboard Linings	Ceiling Joist – Boxed Lipped C-Studs with No Nogging			
		Ceiling Joist Spacing (mm)	Allowable Span of Joist (mm)		
	Above: 2 x 16mm Gyprock fire grade plasterboard Below: 3 x 16mm Gyprock fire grade plasterboard		600	End Support (Figure 259) 1.15mm BMT Track	End Support (Figure 260) 2 x 1.5mm BMT Angle
		400		1800	4150
		300		2300	4600
		300	2700	4900	

NOTES

Uniform Distributed Load = 0.25kPa. Maximum Deflection = Span÷360 or 10mm.  
Single C-stud joist members should be propped prior to fixing of top layers.

Table 41: Maximum Span Of Ceiling Joists. Rondo C-H Stud Profile – Lined Two Sides

System Type	Plasterboard Linings	Ceiling Joist – C-H Profile					
		Ceiling Joist Spacing (mm)	Allowable Span of Joist (mm)				
	Above: 1 x 25mm Gyprock Shaft Liner Below: 2 x 16mm Gyprock fire grade plasterboard		600	C-H Profile Description			
		300		64CH55	64CH90	102CH55	102CH90
				1550	2400	1550	3160
		300	3040	3530	3040	4300	
System Type	Plasterboard Linings	Ceiling Joist – C-H Profile					
		Ceiling Joist Spacing (mm)	Allowable Span of Joist (mm)				
	Above: 1 x 25mm Gyprock Shaft Liner Below: 3 x 16mm Gyprock fire grade plasterboard		600	C-H Profile Description			
		300		64CH55	64CH90	102CH55	102CH90
				1330	2120	1330	2820
		300	2620	3270	2620	4000	

NOTES

Uniform Distributed Load = 0.25kPa. Maximum Deflection = Span÷360 or 10mm.  
Where C-H profile joists are used, a C-H PROFILE joiner is required at joints in Gyprock Shaft Liner.

Figure 259: C-Stud Joist End Support Side Fix Using 1.15mm BMT Track

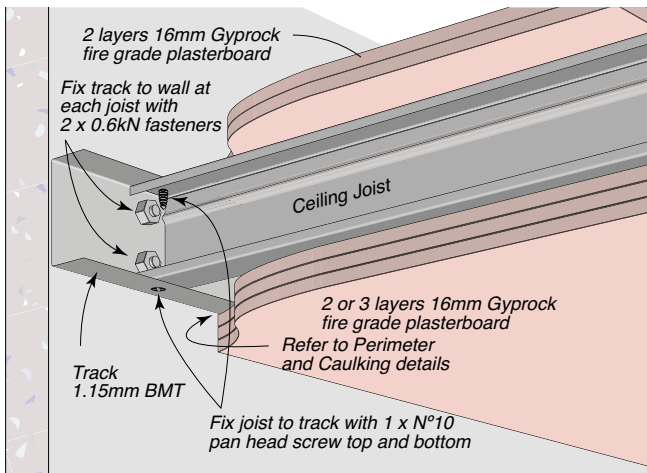


Figure 260: C-Stud Joist End Support Side Fix Using 1.50mm BMT Angle

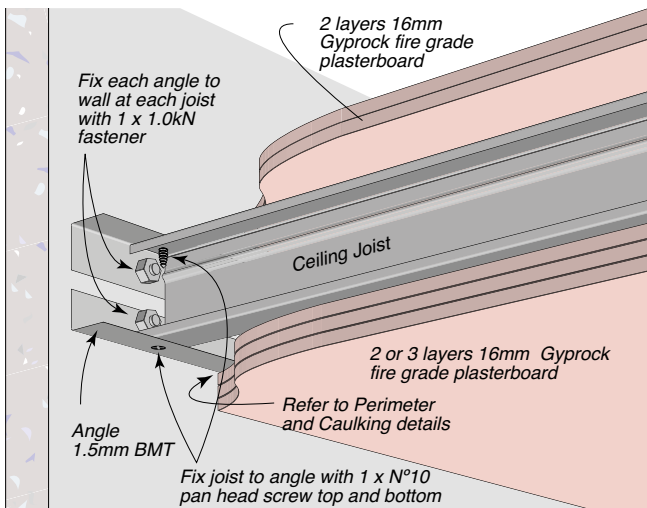


Figure 261: C-Stud Joist End Support Top Fix Using 0.55mm BMT Track  
Suitable for all joist spans

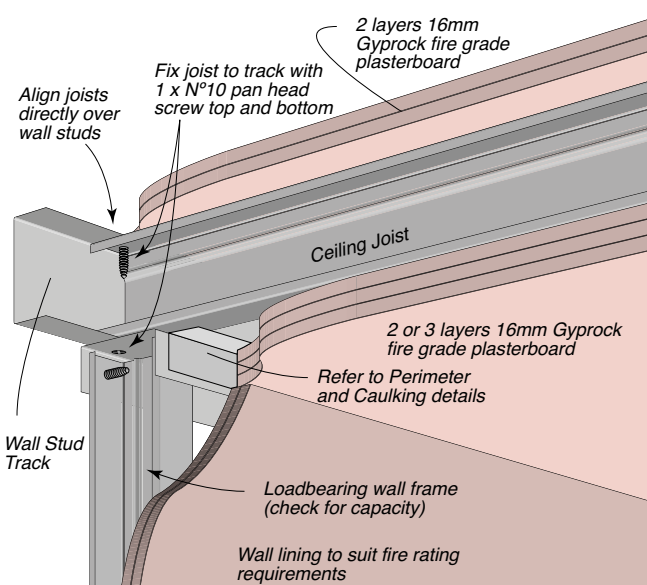


Figure 262: Rondo C-H Stud

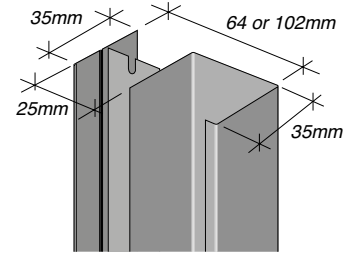


Figure 263: Rondo J-Track

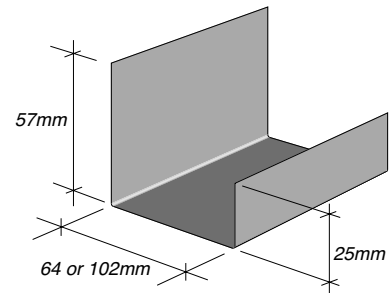


Figure 264: C-H Profile Joist End Support Side Fix Using 1.15mm BMT Track

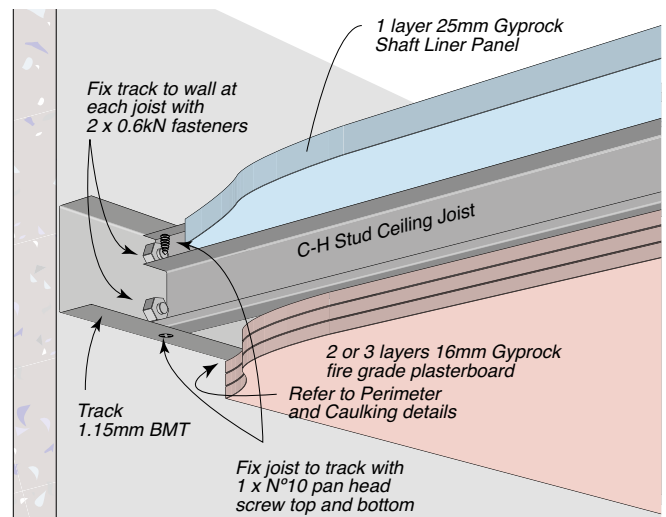
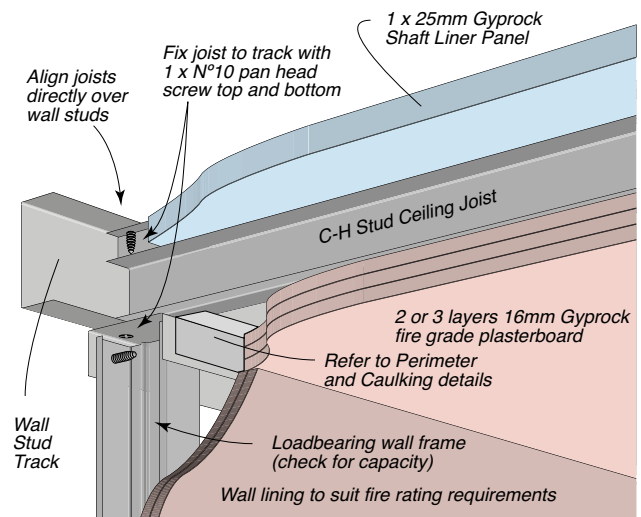


Figure 265: C-H Profile Joist End Support Top Fix Using 0.55mm BMT Track



# Sheet Installation – Non-Fire Rated

## Sheet Layout

Sheets should be installed with the long edge at right angles to the direction of the framing to which they are fixed.

## Curved Ceilings

For plasterboard fixing to curved ceilings, refer to the Curved Walls section in this guide.

## Control Joints

The continuity of lining sheets and support framework should be broken at control joints.

Control joints may be positioned to intersect light fixtures, heating vents and air diffusers.

Control joints are to be installed in fire rated ceilings:

- To coincide with control joints in the supporting frame.
- At changes of framing type or framing direction.
- In continuous interior ceiling areas lined with plasterboard, spaced at no more than 12m centres in both directions.

In 2 layer ceiling systems, Gyprock Laminating Screws (40mm x N°10) may be used to laminate layers of plasterboard together at control joints formed between framing.

Refer to the Framing section earlier in this guide. Also refer to Junctions & Penetrations for appropriate details.

## Caulking

To attain the stated acoustic rating, fill all gaps and around penetrations with Gyprock Wet Area Acrylic Sealant or Gyprock Fire Mastic or CSR FireSeal. Refer to Junctions & Penetrations for appropriate details.

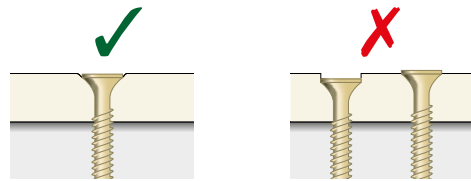
## Plasterboard Jointing & Finishing

Refer to detailed Jointing & Finishing information later in this guide.

## Sheet Fixing Procedure

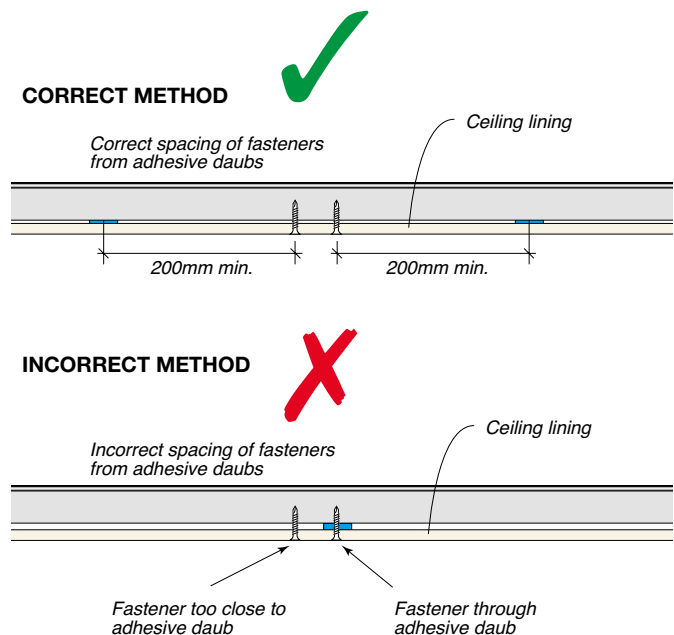
- Plasterboard must not be fixed directly to steel thicknesses greater than 1.6mm BMT.
- Fasteners are to be installed at 10 - 16mm from sheet edges.
- Sheets are to be held firmly against frame while fasteners are positioned. Wherever possible commence fastening from the centre portion of the sheet, proceeding to the ends and edges. Alternatively, start at one edge and work across the sheet to the other edge.
- Fasteners are to be driven home with the head slightly below the surface of the sheet, but not punched through the face linerboard. Care should be taken to avoid damaging the face or core of the plasterboard. Refer to the following detail.

Figure 266: Fastener Driving – Plasterboard



- Adhesive does not constitute a fixing system by itself and must be used in conjunction with screws.
- When directly fixing a single layer system, the sheets may be either all fastener fixed or fastener/adhesive fixed.
- When fixing a two layer system, the first layer must be all fastener fixed. The second layer may be all fastener fixed or adhesive/fastener fixed.
- For pre-painted metal framing, use 1/3 spacing method or full screw fixing.
- Perforated plasterboard must be fixed with screws. Adhesive is not permitted.
- Adhesive daubs must be kept 200mm minimum from fastening points. Refer to the following detail.

Figure 267: Adhesive/Fastener Placement



For additional sheet fixing information, refer to specific systems detailed later in this section.



## Plasterboard Joints on Ceilings

Wherever possible, butt jointing of sheets on ceilings should be avoided.

In single layer systems, where butt joints on ceilings are positioned between framing members, the sheet ends must be reinforced (back-blocked), and depressed, forming a recess to enable jointing.

For detailed information, refer to Butt Joints Off Framing, in this section.

In multi-layer systems, butt joints in hidden layers are to be formed on framing members and offset by 450mm minimum in consecutive layers. Butt joints in the final layer are to be formed within 50mm of the centreline between members, offset by a minimum of 450mm from previous layers and in adjoining sheets, and fixed with laminating screws at 200mm maximum centres.

In multi-layer systems recessed joints in consecutive layers must be offset by a minimum of 300mm.

In single layer systems, recessed joints must be back-blocked in some cases. Refer to the following topic for details.

In 2 layer ceiling systems, Gyprock Laminating Screws (40mm x N°10) may be used to laminate layers of plasterboard together at butt joints formed between framing.

## Back-Blocking of Recessed Joints

Back-blocking recessed joints is required in Level 4 Finishes where three or more recessed joints occur in a continuous ceiling area, and in all Level 5 Finish applications. Refer to the Table 6 "Levels of Finish" and Figure 268. The plaster used for back blocking may be a base coat, cornice cement or Back Blocking Cement.

- Cut back-blocks of at least 200mm width and long enough to fit loosely between the framing members.
- Apply plaster to the back-blocks with a notched spreader to form 6mm x 6mm beads at approximately 20mm centres at right angles to the joint, over the entire face of the back-block.
- Apply Gyprock sheets with the long edges at right angles to joists or battens. Place back-blocks along the full length of the sheet edge. As soon as all the blocks are in position, install the adjoining sheet.
- Back-blocks must be adhered in position before the joints are finished. Back-blocks may also be applied by working above the ceiling after the sheets have been fixed.

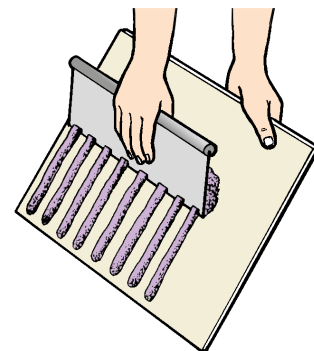
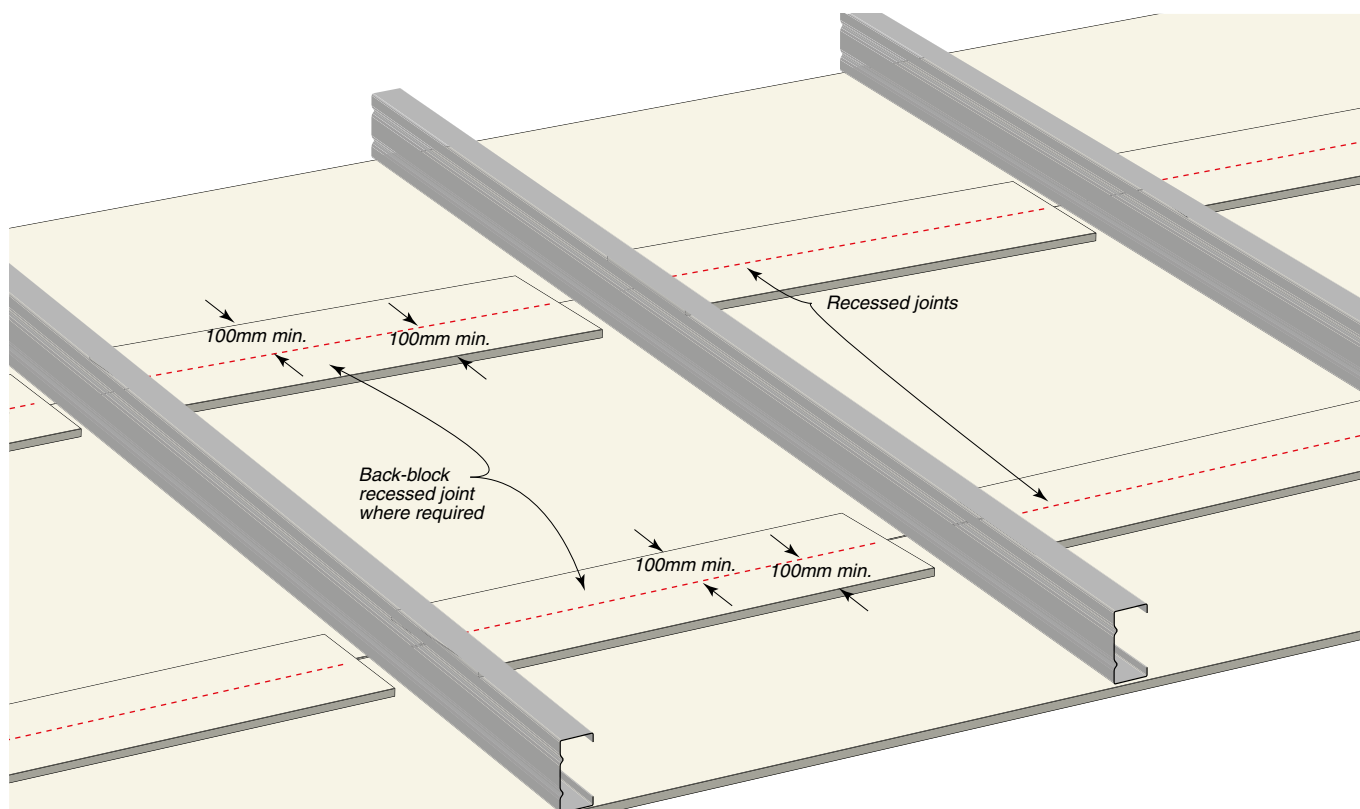


Figure 268: Back-Blocking Of Recessed Joints On Ceilings



### Butt Joints Off Framing

Butt joints in single layer plasterboard systems formed off framing must be formed with a depression to allow smooth jointing.

One method is back-blocking which uses temporary battens screwed to framing across the front of the joint together with pieces of Gyprock plasterboard adhesive laminated to the back of the joints. Refer to Figure 269.

A second method uses Rondo B005 battens to form the depressed joint, along with pieces of Gyprock plasterboard adhesive laminated to the back of the joint. Refer to Figure 270.

A third method using B005 battens alone. This method may be used in specific cases only. Refer to Figure 271.

**One of these methods is to be used on all butt joints formed between framing members. See requirements in the Levels of Finish table.**

Where mid-span butt or end joints are not required but are used to minimise plasterboard wastage, these joints must also be back-blocked.

- Sheet ends should be neatly cut and butted together within 50mm of the centre line between the studs.

- Fix back-blocks with Gyprock Back-Blocking Cement, Base Coat or Cornice Cement applied with a notched spreader to form beads 6mm x 6mm at approximately 20mm centres over the entire face of the back-block.
- Bend sheet ends upwards using temporary battens and packing (such as screws) installed at 300mm maximum centres along the butt joint to form a 2mm deep depression (as illustrated).
- Reinforce the butt joint by back-blocking with Gyprock plasterboard placed between the framing. Back-block along the full length of the butt joint and overlapping the recessed joints by a minimum 100mm.
- Fix back-blocks with Gyprock Back-Blocking Cement, Base Coat or Cornice Cement as described earlier.
- Allow the adhesive to set for a minimum of 24 hours before removing the temporary battens. A hollow formation suitable for jointing remains.

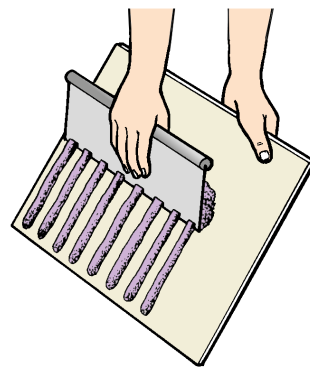


Figure 269: Back-Blocking Of Butt Joints Located Off Framing

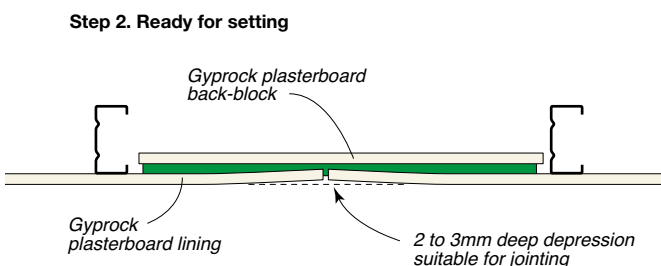
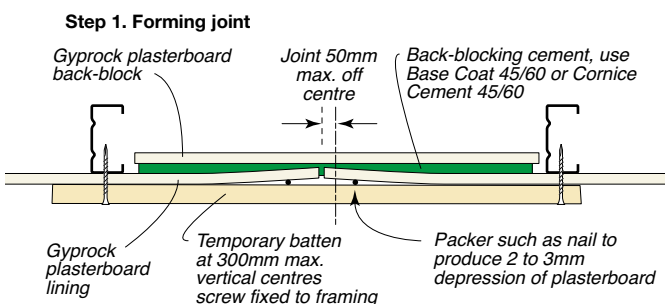
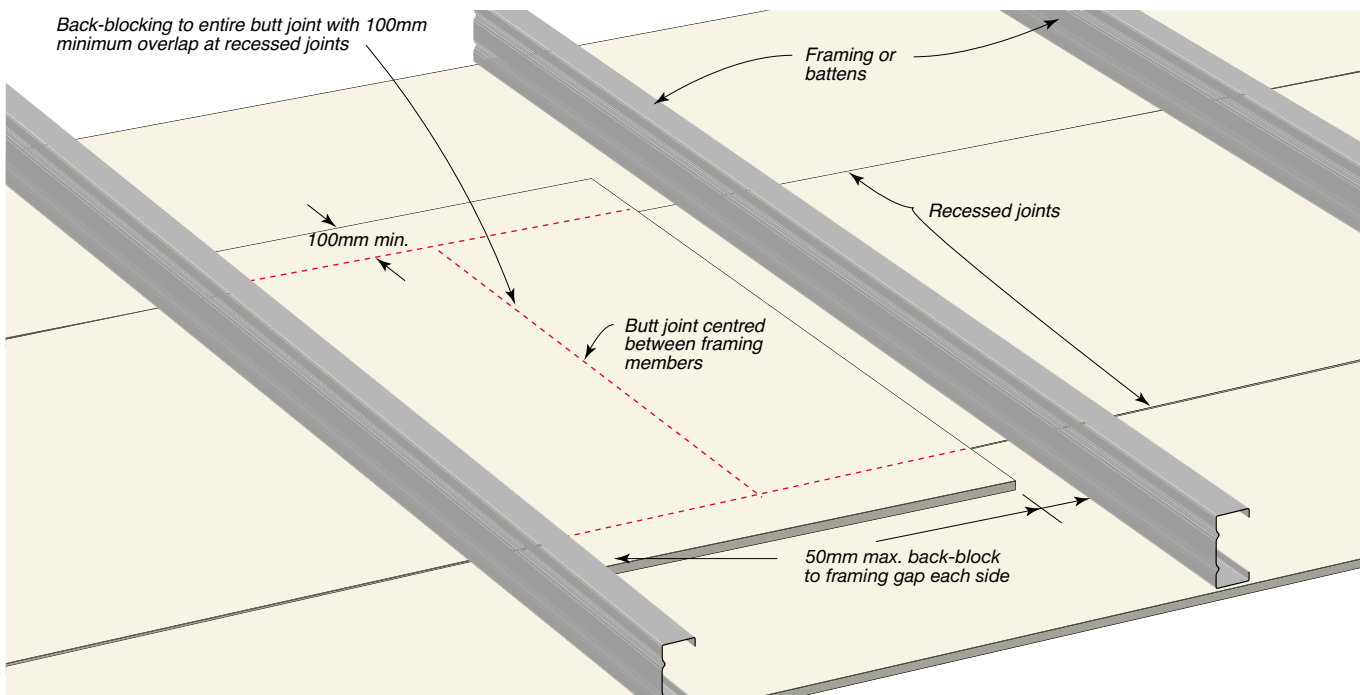


Figure 270: Butt Joint Construction Using Rondo B005 Battens And Back-Blocking (Top View)

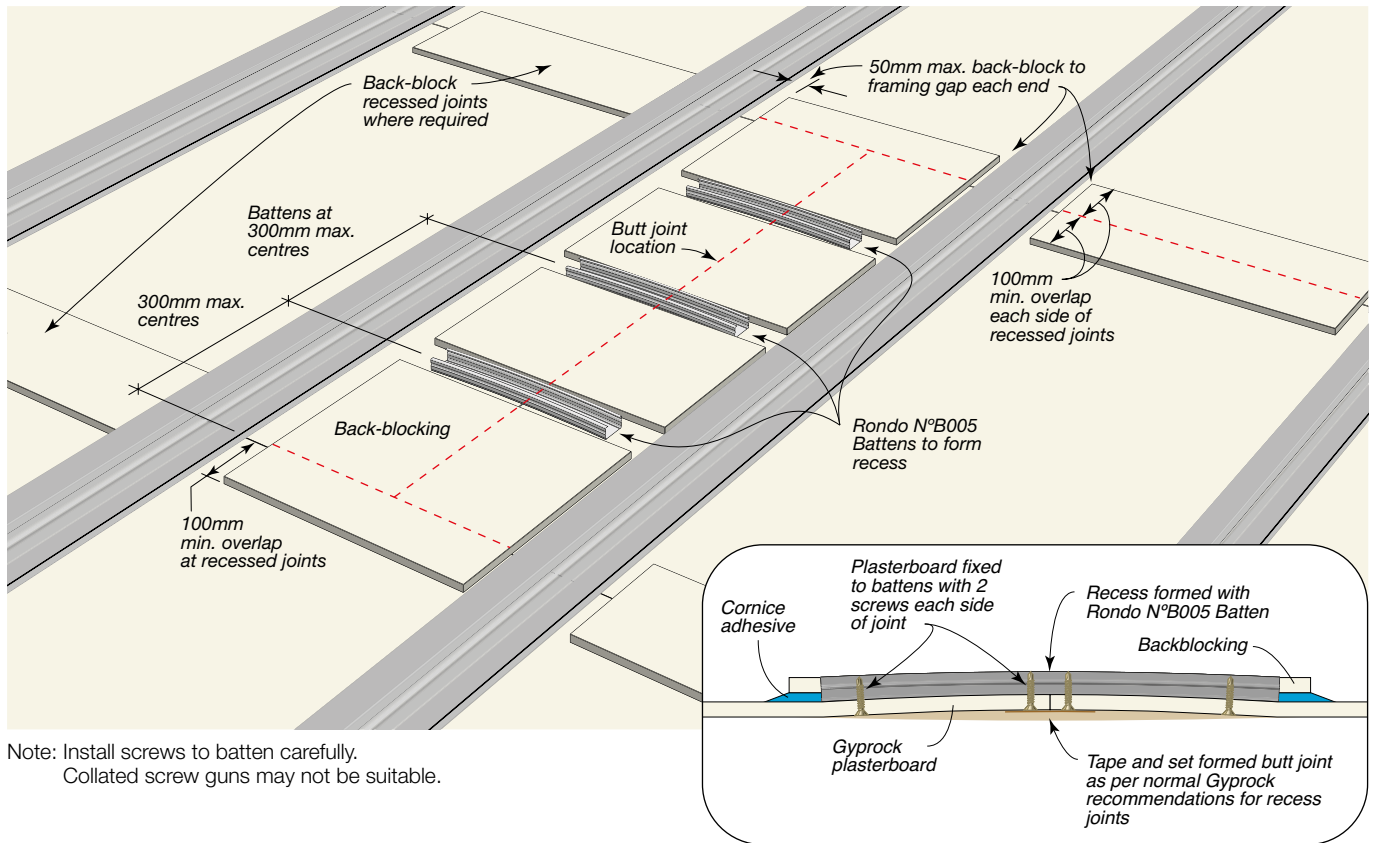


Figure 271 shows suitable details for suspended ceilings in commercial buildings which are not required to be fire rated, are isolated from building movement at the perimeter and have a well controlled air environment such as occupied, air conditioned offices.

Figure 271: Butt Joint Construction Using Rondo B005 Battens (Top View)

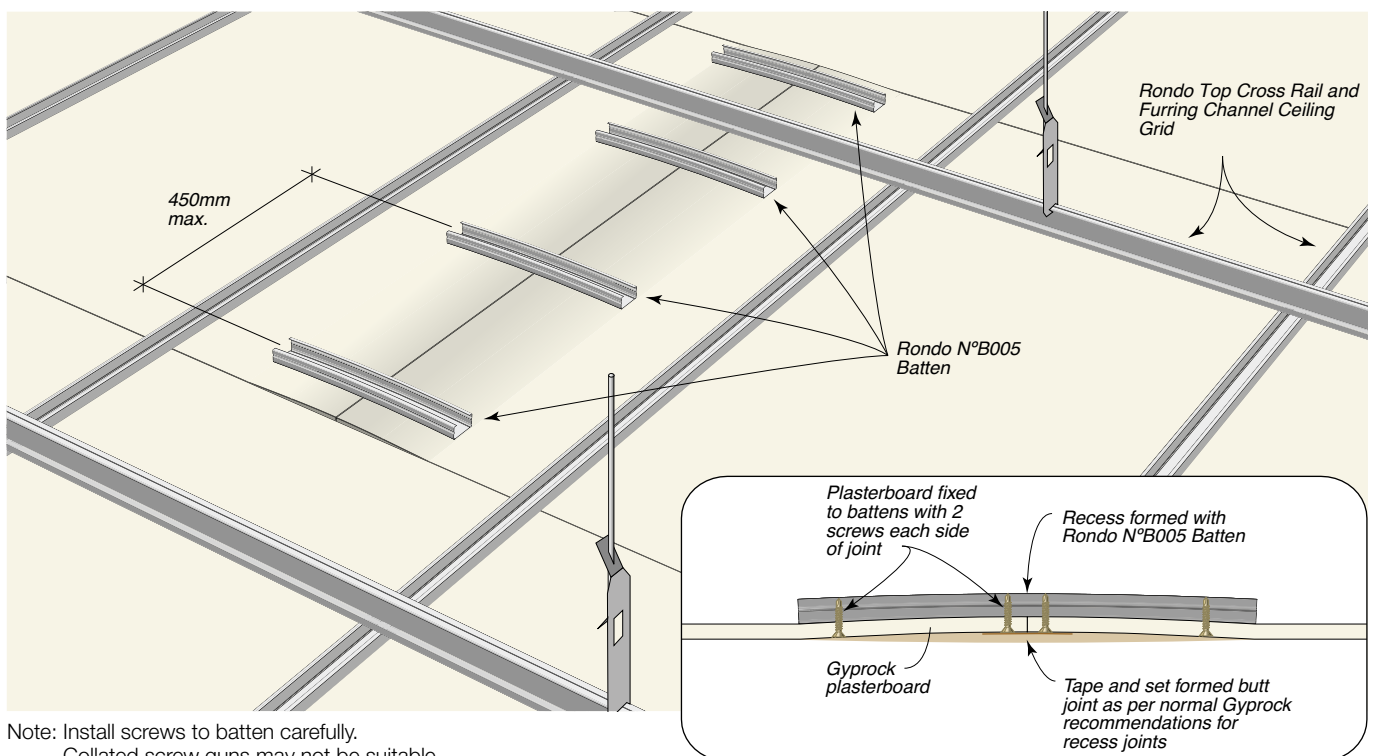
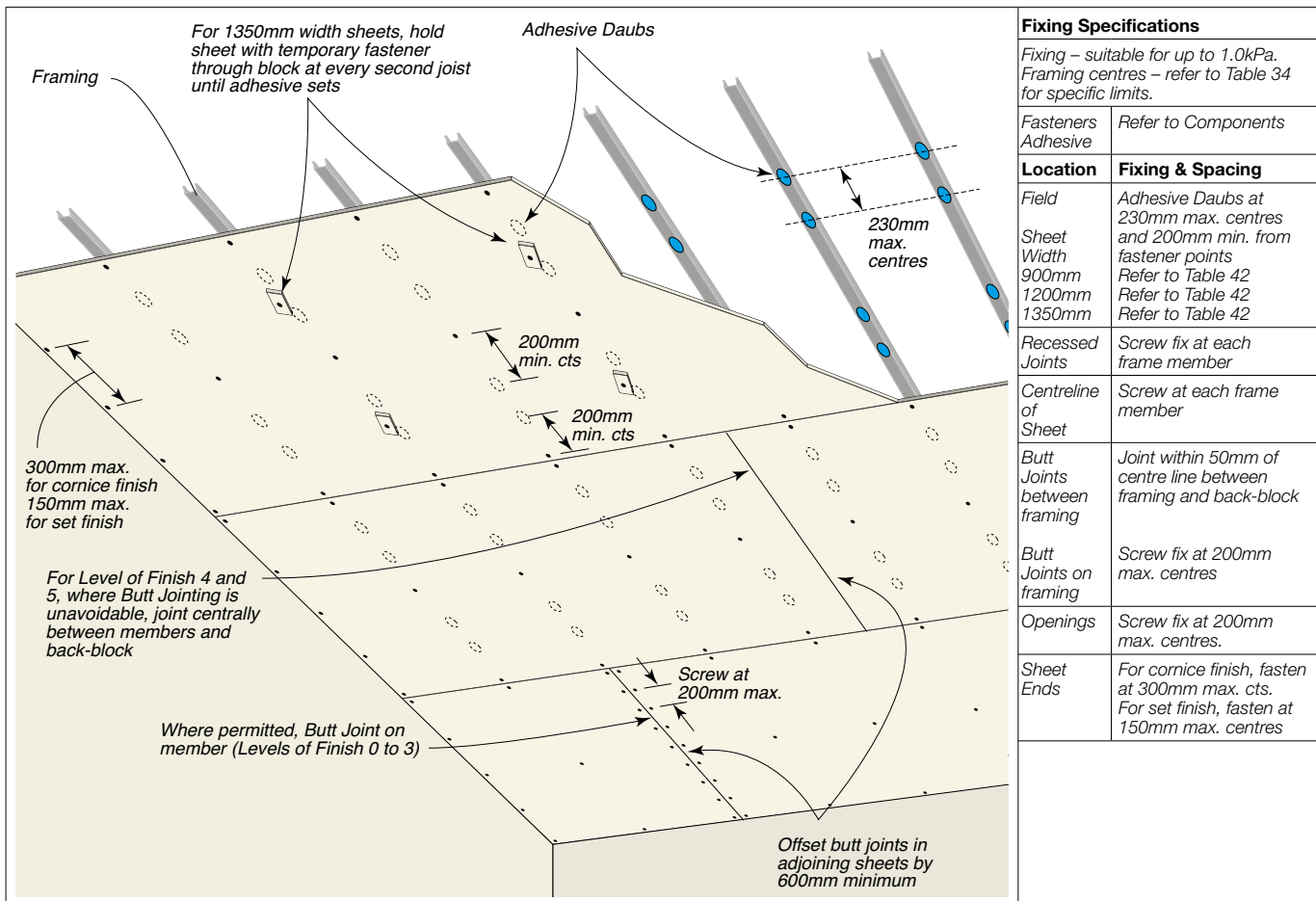


Figure 272: Plasterboard Fixing – Single Layer – Adhesive & Screw Fixing



**Notes On Fixing**

- Install sheets with paper bound edges at right angles to joists/framing to which sheets are being fixed.
- Daubs of adhesive must be 200mm minimum from fastening points.
- Place edge fasteners at 10 to 16mm from sheet edge.
- Caulking, refer to the Junctions & Penetrations section.

**Fixing Procedure**

Refer to Components for fastener details.

- Apply stud adhesive to framing in accordance with the following table. Using a broadknife, apply daubs 25mm diameter x 15mm high at 230mm maximum centres and at 200mm minimum from fastening points at sheet edges and centreline. Omit daubs at ends of sheets and at butt joints.

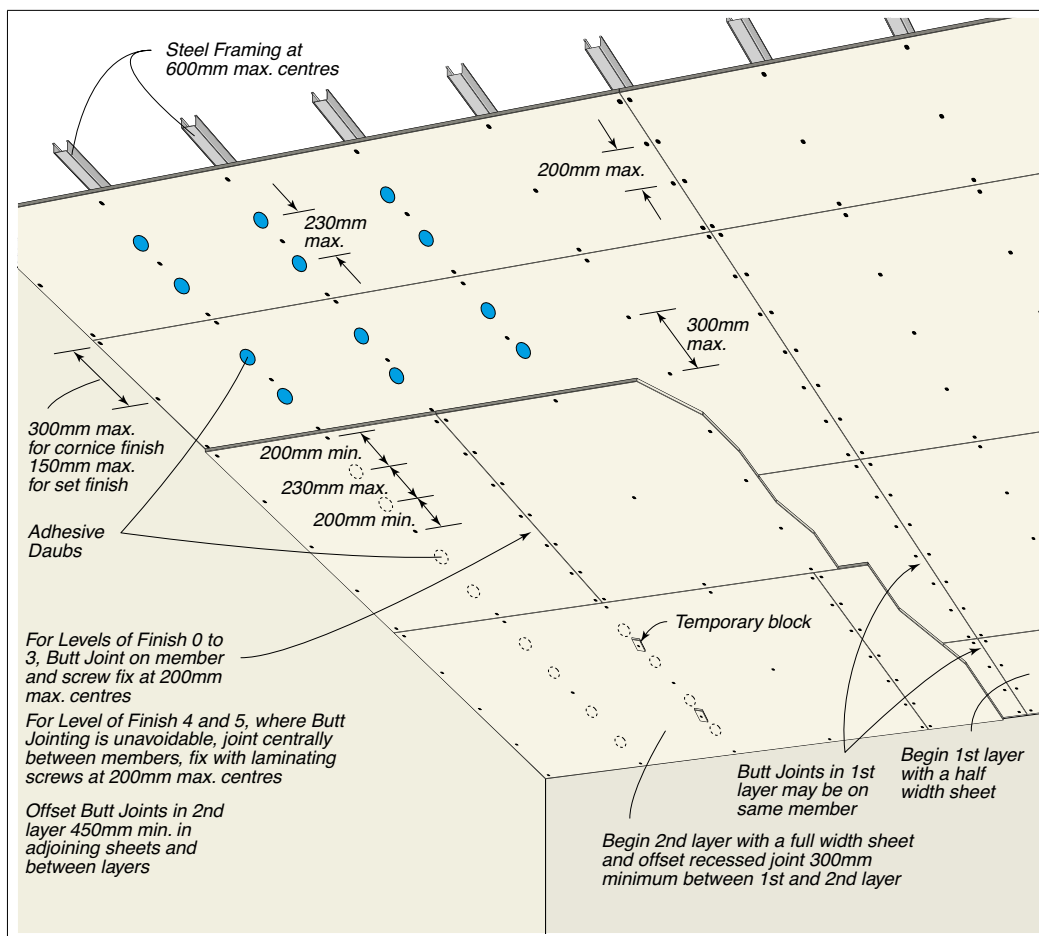
- Apply plasterboard and fasten one recessed edge as per the fixing table.
- Press the sheet firmly against the framing, then fasten along the second recessed edge as per the fixing table.
- Screw fix along the centreline of sheet as per the fixing table.
- Where butt joints are made on framing members, screw fix as per the fixing table.
- Where butt joints are made between framing, join within 50mm of centreline between framing and back-block joint. Back-block recessed joints where required. Refer to Back-blocking details in this guide.
- Offset butt joints in adjoining sheets by 600mm minimum.
- Screw fix around service openings as per the fixing table.
- Fasten ends of sheets as per the fixing table.
- Under slow drying conditions, hold 1350mm wide sheets against the framing members for at least 48 hours with temporary fasteners driven through plasterboard blocks at every second frame. Refer to the fixing detail above.

Table 42: Fastener & Adhesive Placement

Plasterboard Width (mm)	Conventional Spacing	1/3 Spacing
900	F A F A F	F A F A F
1200	F A A F A A F	F A F A F A F
1350	F A A F A A F	F A F A F A F

F = Fastener A = Adhesive Daub

Figure 273: Plasterboard Fixing – Two Layer – Adhesive & Screw Fixing



Fixing Specifications	
Fixing – suitable for up to 1.0kPa. Framing centres – refer to Table 34 for specific limits.	
1st Layer Screws	Refer to Components
2nd Layer Screws & Adhesive	Refer to Components
1st Layer	Fixing & Spacing
Recessed Joints	Screw fix at each frame member
Body Sheet Width	Screw fix to each framing member at 300mm max. centres
900mm	4 screws equally spaced
1200mm	5 screws equally spaced
1350mm	6 screws equally spaced
Butt Joints on framing	Screw fix at 200mm max. centres
Sheet Ends & Openings	Screw fix at 300mm max. centres
2nd Layer	Fixing & Spacing
Body	Adhesive Daubs at 230mm max. centres and 200mm min. from fastener points
Sheet Width	2 daubs
900mm	4 daubs
1200mm	4 daubs
1350mm	4 daubs
Recessed Joints	Screw fix at each frame member
Centreline of Sheet	Screw fix at each frame member
Butt Joints on framing	Screw fix at 200mm max. centres
Butt Joints between framing	Laminating screws at 200mm max. centres
Openings	Screws at 200mm max. centres
Sheet Ends	For cornice finish, screw fix at 300mm max. cts. For set finish, screw fix at 150mm max. centres

**Notes On Fixing**

- Install sheets with paper bound edges at right angles to the furring/framing to which sheets are being fixed.
- Daubs of adhesive must be 200mm minimum from fastening points.
- Place edge fasteners at 10 to 16mm from sheet edge.
- Caulking, refer to the Junctions & Penetrations section.

**Fixing Procedure**

Refer to Components for fastener details.

**First Layer**

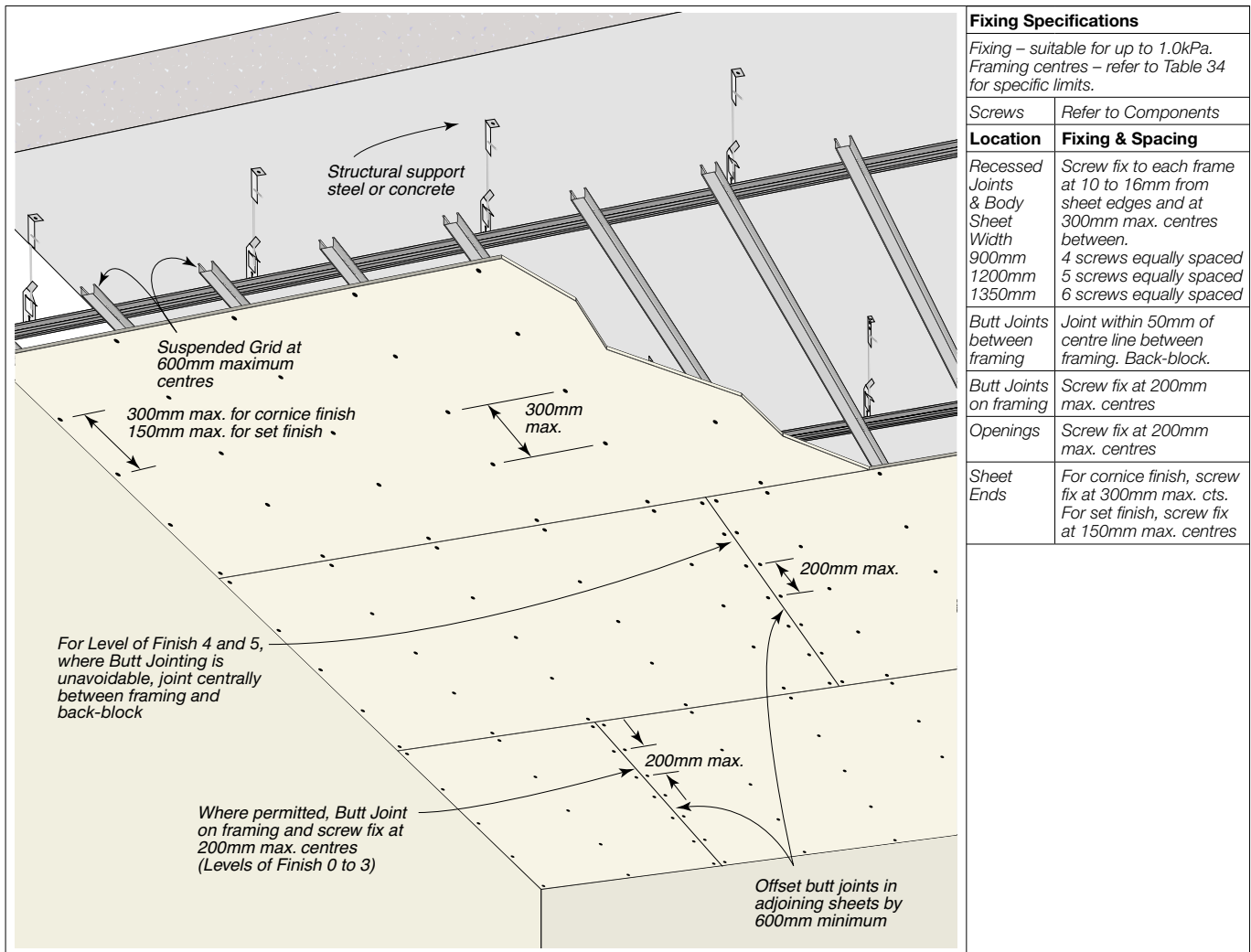
- Begin with a half width sheet.
- Apply plasterboard and fasten along recessed edges as per the fixing table.
- Press the sheet firmly against the framing and fasten the body of the board to each framing member as per the fixing table.
- Centre butt joints on framing members and fasten as per the fixing table.
- Fasten around service openings as per the fixing table.
- Fasten ends of sheets as per the fixing table.

**Second Layer**

- Begin with a full width sheet so that recess joints will be offset from first layer by 300mm min.
- Using a broadknife, apply adhesive daubs as per the fixing table. Omit daubs at ends of sheets and at butt joints.
- Apply plasterboard and fasten one recessed edge as per the fixing table.
- Press the sheet firmly against the framing, then fasten along the second recessed edge as per the fixing table.
- Fasten along the centreline of the sheet as per the fixing table.
- Offset butt joints in adjoining sheets and between layers by 600mm minimum and fasten as per the fixing table.
- Fasten around service openings as per the fixing table.
- Fasten ends of sheets as per the fixing table.
- Under slow drying conditions, hold 1350mm wide sheets against the framing members for at least 48 hours with temporary fasteners driven through plasterboard blocks at every second frame.



Figure 274: Plasterboard Fixing – Single Layer – Screw Fixing



**Notes On Fixing**

- Install sheets with paper bound edges at right angles to the furring/framing to which sheets are being fixed.
- Place edge fasteners at 10 to 16mm from sheet edge.
- Caulking, refer to the Junctions & Penetrations section.

**Fixing Procedure**

Refer to Components for fastener details.

**Single Layer System**

- Apply plasterboard and fasten to each framing member along recessed edges.
- Press the sheet firmly against the framing and fasten the body of the board to each framing member as per the fixing table.
- Where butt joints are made between framing, join within 50mm of centreline between framing and back-block joint. Back-block recessed joints where required. Refer to the Levels of Finish table.

- Where butt joints are made on framing members, screw fix as per the fixing table.
- Offset butt joints in adjoining sheets by 600mm minimum.
- Fasten around service openings as per the fixing table.
- Screw fix ends of sheets as per the fixing table.

**Two Layer Systems**

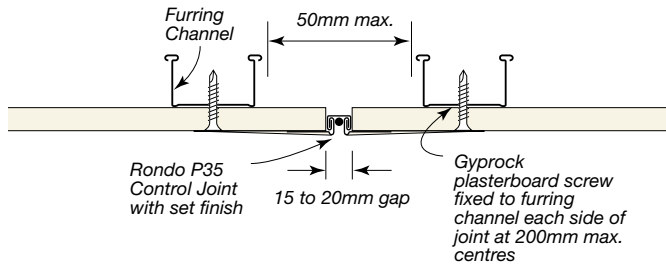
- Fix the first layer as detailed for a single layer system, beginning with a half width sheet. Butt joints may be on the same member.
- Begin the second layer with a full width sheet so that the recess joints will be offset from the first layer joints by 300mm minimum.
- Offset butt joints a minimum of 600mm between layers and between adjacent sheets in the second layer.
- Fix the second layer using screws applied to the same specifications as detailed above for a single layer system.



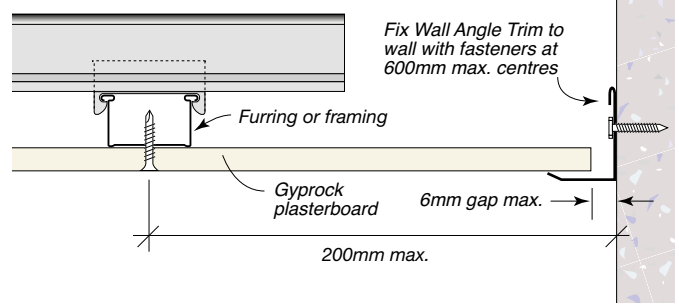
# Junctions & Penetrations – Non-Fire Rated

The following details are suitable for non-fire rated ceilings with no acoustic requirements only

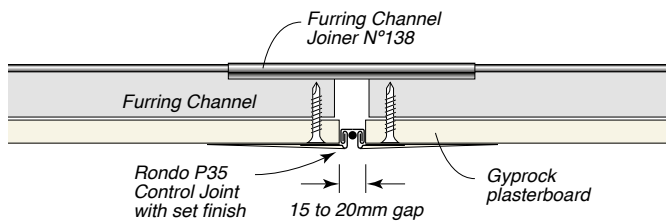
**Figure 275: Control Joint – Parallel To Framing – Plasterboard**



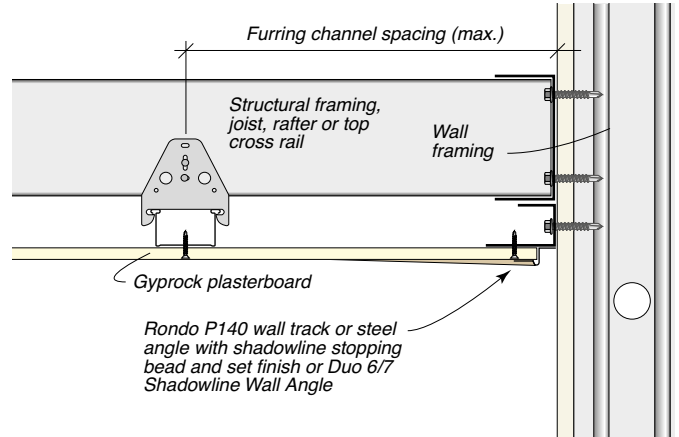
**Figure 279: Perimeter Detail – Wall Angle Trim**



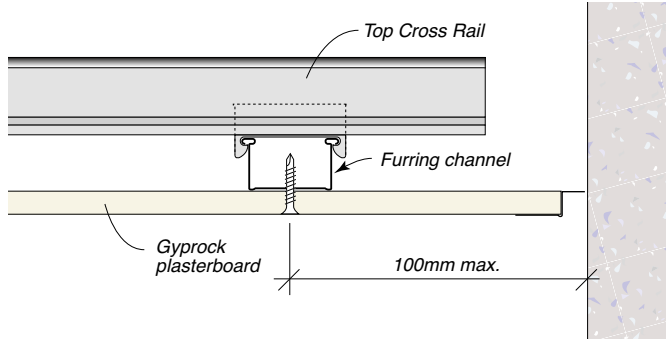
**Figure 276: Control Joint – Perpendicular To Framing – Plasterboard**



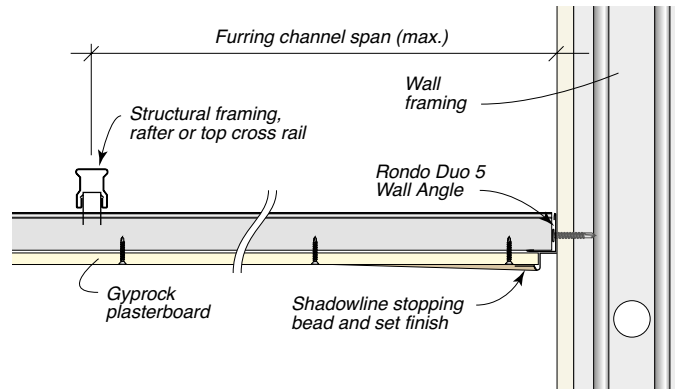
**Figure 280: Perimeter Detail – Shadowline Finish**



**Figure 277: Perimeter Detail – Shadowline Finish**



**Figure 281: Perimeter Detail – Shadowline Finish**



**Figure 278: Perimeter Detail – Cornice Finish**

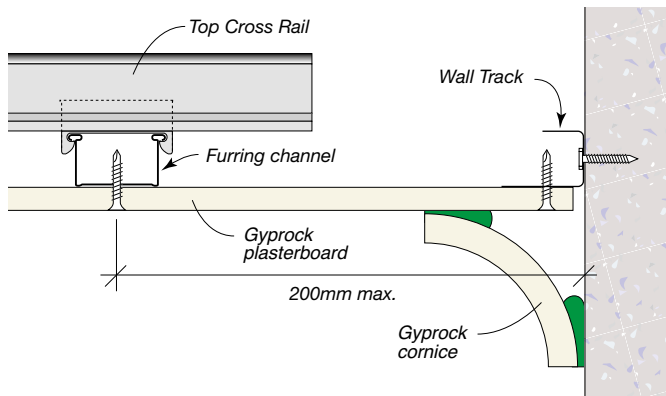


Figure 282: Wall/Ceiling Junction – Plasterboard Lining

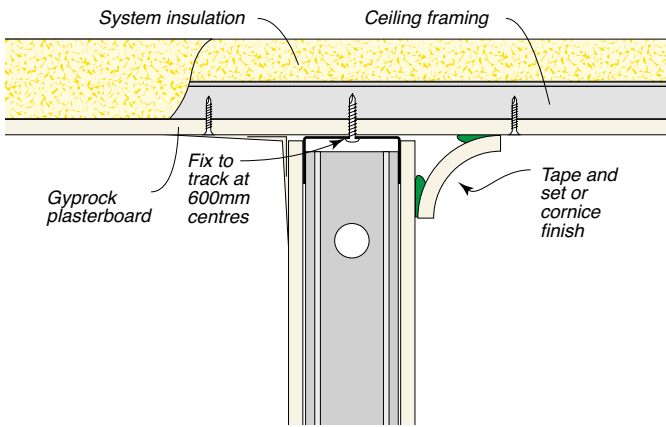


Figure 283: Wall/Ceiling Junction – Plasterboard Lining

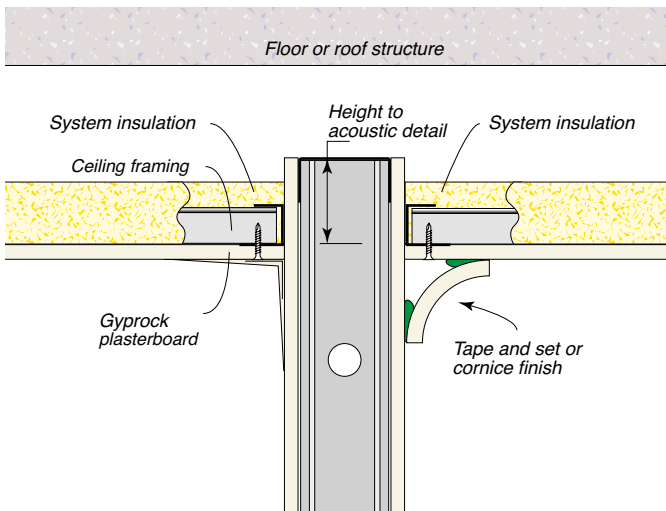
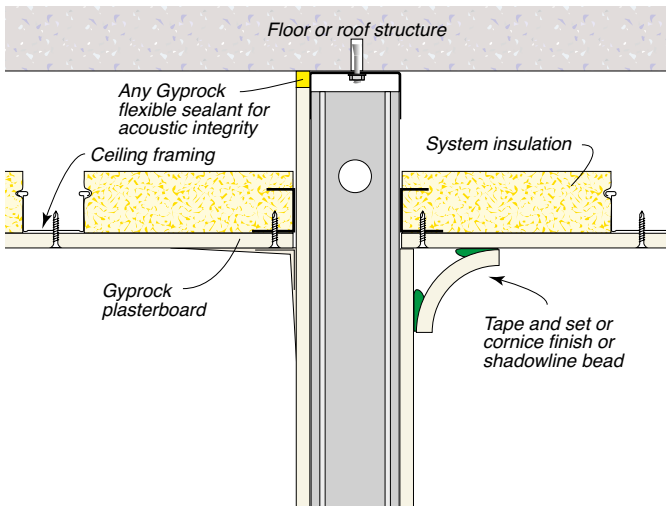


Figure 284: Wall/Ceiling Junction – Plasterboard Lining

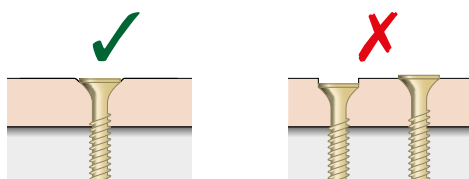


## Sheet Installation – Fire Rated

### Fixing Notes

- Gyprock plasterboard sheets should be installed with the long edge at right angles to the direction of the framing to which they are fixed.
- Plasterboard must be fastener fixed only, adhesive is not permitted.
- Fire rated ceiling systems must be installed strictly in accordance with CSR Gyprock specifications.
- Plasterboard must not be fixed directly to steel thicknesses greater than 1.6mm BMT.
- Fasteners are to be installed at 25mm from sheet edges and 15mm from sheet ends.
- Sheets are to be held firmly against frame while fasteners are positioned. Wherever possible commence fastening from the centre portion of the sheet, proceeding to the ends and edges. Alternatively, start at one edge and work across the sheet to the other edge.
- Fasteners are to be driven home with the head slightly below the surface of the sheet, but not punched through the face linerboard. Care should be taken to avoid damaging the face or core of the plasterboard.

Figure 285: Fastener Driving – Plasterboard



### Plasterboard Joints

Wherever possible, butt jointing of sheets on ceilings should be avoided.

- In multi-layer systems, butt joints in hidden layers are to be formed on framing members and offset by 450mm minimum in adjoining sheets and in consecutive layers. Butt joints in the final layer are to be formed within 50mm of the centreline between members, offset by a minimum of 450mm from previous layers and in adjoining sheets, and fixed with laminating screws as per system installation details.
- In multi-layer systems recessed joints in consecutive layers must be offset by a minimum of 300mm.
- Sheets are to be fitted together neatly at joints. Gaps up to 3mm wide must be filled with a Gyprock Base Coat before jointing.

### Control Joints

The continuity of lining sheets and support framework should be broken at control joints.

Control joints may be positioned to intersect light fixtures, heating vents and air diffusers.

Control joints are to be installed in fire rated ceilings:

- To coincide with control joints in the supporting frame.
- At changes of framing type or framing direction.
- In continuous interior ceiling areas lined with plasterboard, spaced at no more than 12m centres in both directions.

Refer to the Framing section earlier in this guide. Also refer to Junctions & Penetrations for appropriate details.

### Laminating Screws

In 2 and 3 layer ceiling systems, Gyprock Laminating Screws (40mm x N°10) may be used to laminate layers of plasterboard together at butt joints and control joints formed between framing, and in the field of the board of the third layer in lieu of fixing to framing.

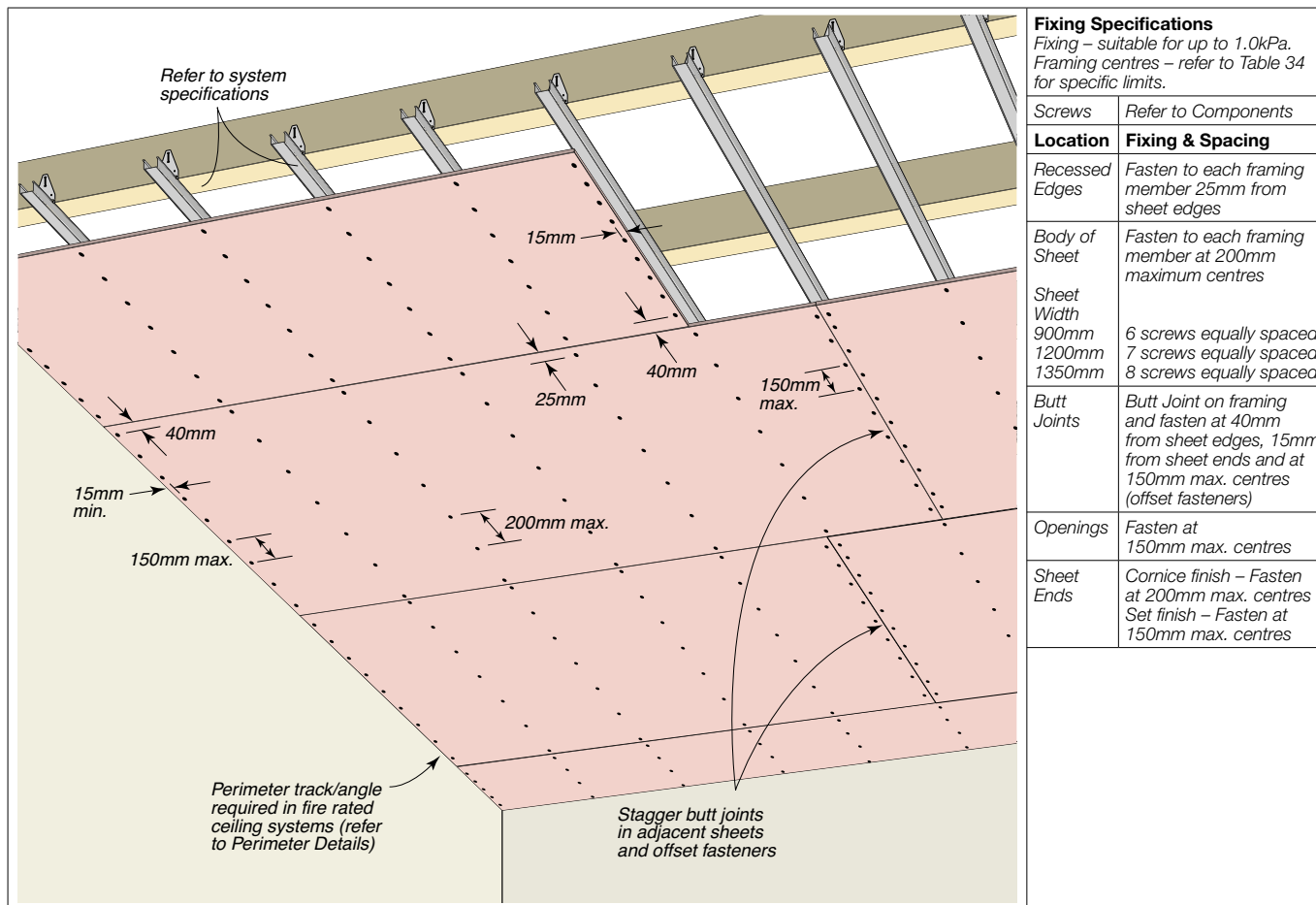
### Caulking

To attain the specified FRL, all perimeter gaps and penetrations must be carefully and completely filled with Gyprock Fire Mastic or CSR FireSeal. In some cases, vermiculite plaster may be used. (Refer to appropriate details). Vermiculite for caulking is to be mixed 3:2 by volume with cornice cement. Use sufficient water to achieve a stiff workable mix. Vermiculite plaster is not to be used as a general purpose acoustic or fire rated caulking, except where detailed in this manual. Vermiculite has no capacity to accommodate building movement.

### Plasterboard Jointing & Finishing

Refer to Jointing & Finishing section in this guide.

**Figure 286: Fire Grade Plasterboard Fixing – Single Layer – Screw Fixing – For Systems With Lining Above Or Below Framing**



**Notes On Fixing**

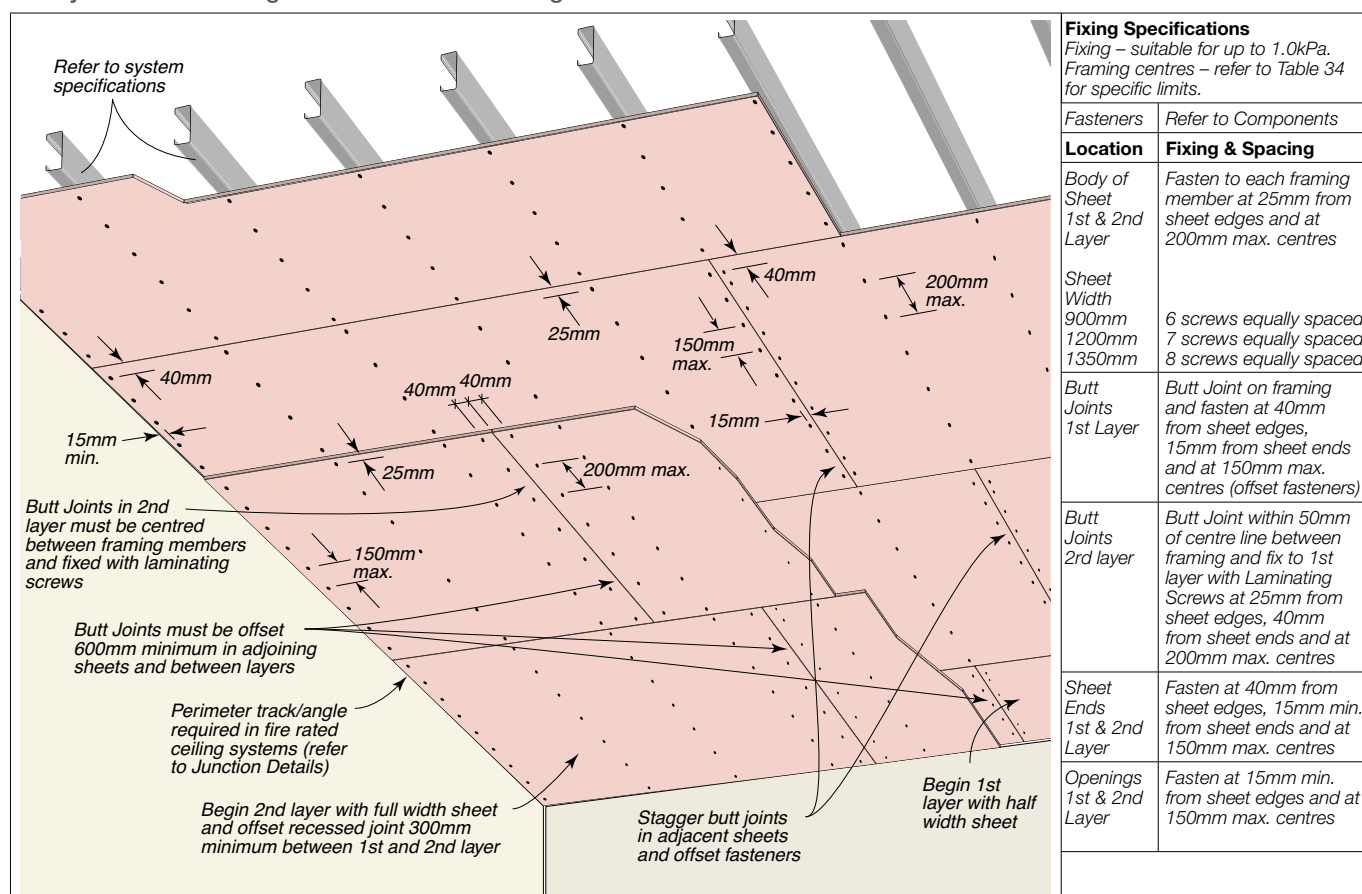
- Install sheets with paper bound edges at right angles to the framing to which sheets are being fixed.
- Place recess edge fasteners at 25mm from sheet edge.
- Butt joints are to be formed on framing, staggered a minimum of 400mm in adjacent sheets.
- Caulking, refer to the Junctions & Penetrations section.

**Fixing Procedure**

Refer to Components for fastener details.

- Begin with a half width sheet.
- Apply plasterboard and fasten 25mm from sheet edges along recessed edges at each framing member.
- Press the sheet firmly against the framing and fasten the body of the board to each framing member as per the fixing table.
- Form butt joints centred on framing members and fasten with screws at 40mm from corners, 15mm from sheet ends and as per the fixing table (offset fasteners).
- Fasten around openings as per the fixing table.
- Fasten ends of sheets as per the fixing table.

Figure 287: Fire Grade Plasterboard Fixing – Two Layer – Screw Fixing – For Systems With Lining Above Or Below Framing



**Notes On Fixing**

- Install sheets with paper bound edges at right angles to the framing to which sheets are being fixed.
- Offset recess joints of 1st and 2nd layers by 300mm min.
- Place recess edge fasteners at 25mm from sheet edge.
- Fix butt joints with screws at 40mm from corners, 15mm from sheet ends.
- Caulking, refer to the Junctions & Penetrations section.

**Fixing Procedure**

Refer to Components for fastener details.

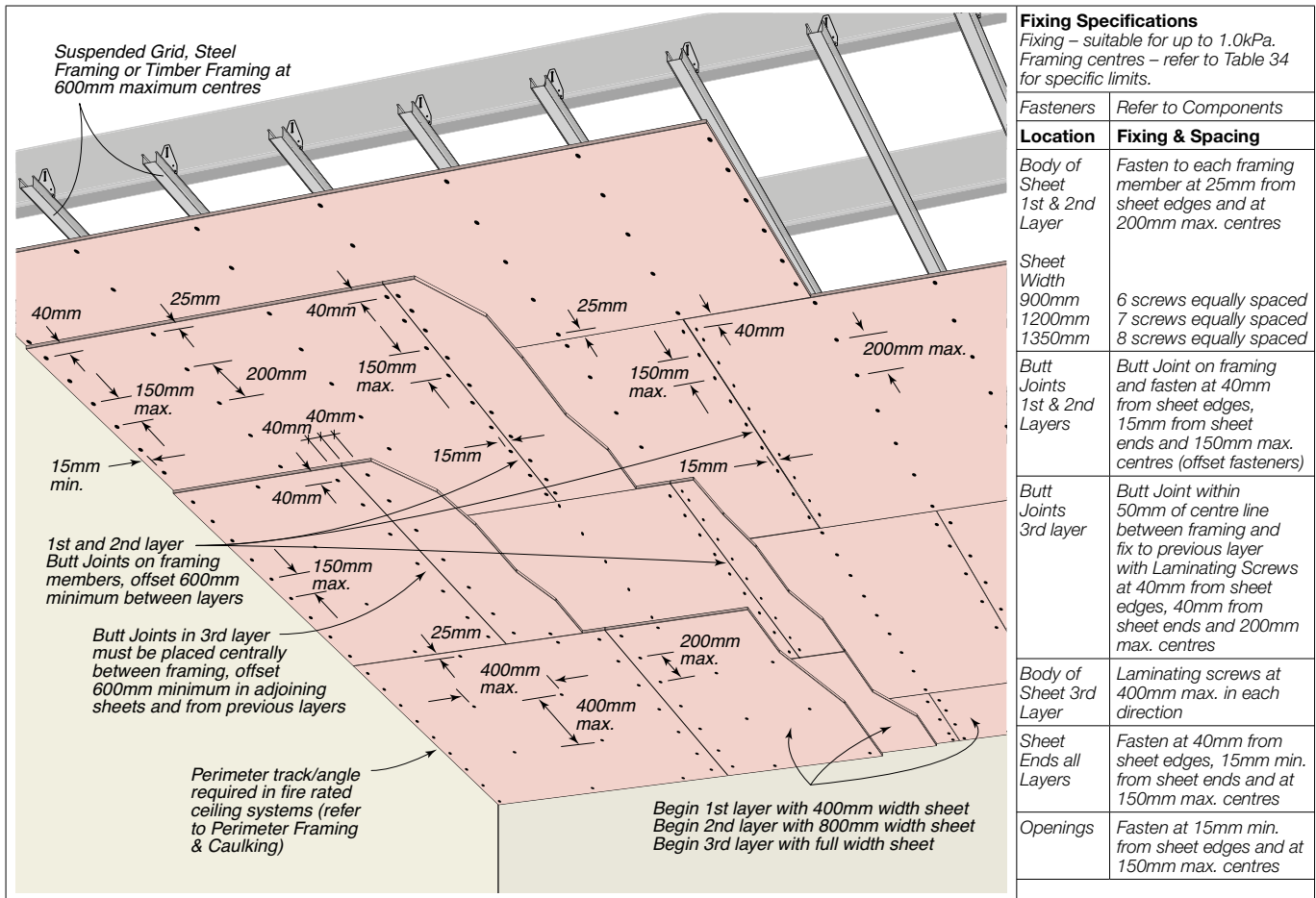
**First Layer**

- Begin with a half width sheet.
- Apply plasterboard and fix recessed edges as per the fixing table.
- Press the sheet firmly against the framing and fasten the body of the board to each framing member as per the fixing table.
- Form butt joints centred on framing members and fasten as per the fixing table.
- Fasten around openings as per the fixing table.
- Fasten ends of sheets as per the fixing table.

**Second Layer**

- Begin with a full width sheet so that recess joints will be offset from first layer by 300mm minimum.
- Apply plasterboard and fasten recessed edges and body of sheets as for the first layer.
- Offset butt joints in adjoining sheets by 400mm minimum.
- Form butt joints within 50mm of the centreline between framing and fix with laminating screws as per the fixing table.
- Fasten around openings as per the fixing table.
- Fasten ends of sheets as per the fixing table.

**Figure 288: Fire Grade Plasterboard Fixing – Three Layer – Screw Fixing – For Systems With Lining Above Or Below Framing**



**Notes On Fixing**

- Install sheets with paper bound edges at right angles to the framing to which sheets are being fixed.
- Offset recess joints between layers by 300mm min.
- Offset butt joints between adjacent sheets and between layers by 400mm minimum.
- Place recess edge fasteners at 25mm from sheet edge.
- Caulking, refer to the Junctions & Penetrations section.

**Fixing Procedure**

Refer to Components for fastener details.

**First Layer**

- Begin with a 400mm width sheet so that recess joints will be offset from second layer.
- Apply plasterboard and screw fix along recessed edges as per the fixing table.
- Press the sheet firmly against the framing and screw fix to each framing member as per the fixing table.

- Form butt joints centred on framing members and fasten at 40mm from corners, 15mm from ends and as per the fixing table.
- Fasten around openings as per the fixing table.
- Fasten ends of sheets as per the fixing table.

**Second Layer**

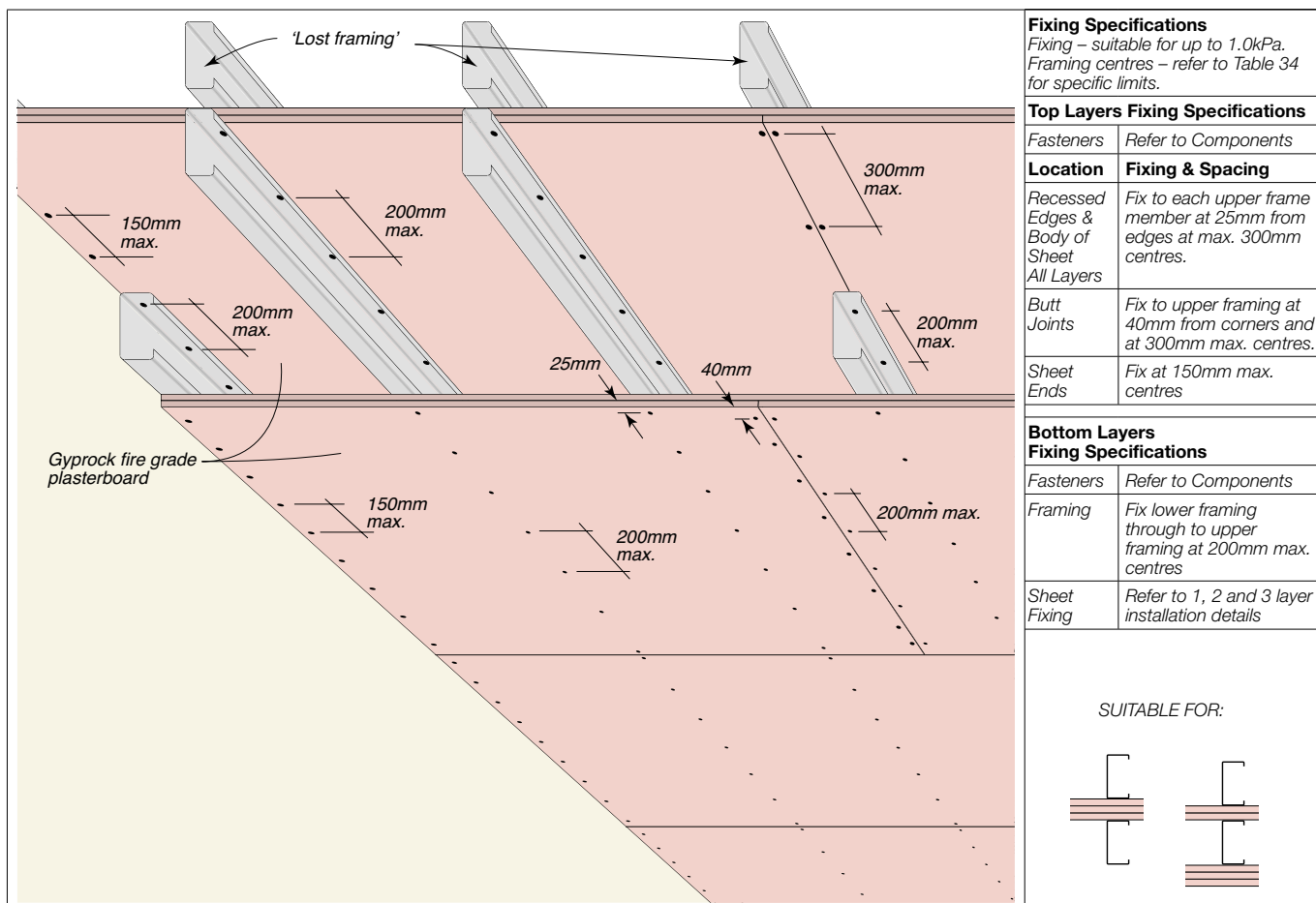
- Begin with an 800mm width sheet. Offset recess joints from the previous layers. Offset butt joints between adjacent sheets and between layers.
- Fasten 2nd layer sheets as for first layer.

**Third Layer**

- Begin with a full width sheet. Offset recess from the previous layers. Offset butt joints between adjacent sheets and between layers.
- Apply plasterboard and fasten recessed edges, body of sheets, around openings and ends as for previous layers.
- Form butt joints and fix with Gyprock Laminating Screws (40mm x N<sup>o</sup>10) as per the fixing table.



Figure 289: Fire Grade Plasterboard Fixing – Steel Framing – Fire Grade From Above And/OR Below – Suitable For Installation With Access From Below Only



**Notes On Fixing**

- Install sheets with paper bound edges at right angles to the framing to which sheets are being fixed.
- Offset recess joints between layers by 300mm min.
- Offset butt joints between adjacent sheets and between layers by 400mm minimum.
- Place recess edge fasteners at 25mm from sheet edge.
- Caulking, refer to the Junctions & Penetrations section.

**Fixing Procedure**

Refer to Components for fastener details.

**Install Upper Framing To Engineer's Detail**

NOTE: Lost framing is to be in addition to required building structure. It is expected to lose strength in a fire.

**First Layer**

- Apply plasterboard and screw fix along recessed edges at each framing member.
- Press the sheet firmly against the framing and fasten the body of the board as per the fixing table.

- Form butt joints centred on framing members and fix as per the fixing table.
- Fasten around openings and ends of sheets as per the fixing table.

**Second/Third Layer**

- Offset recess joints and butt joints as previously detailed.
- Fasten sheet body, openings, ends and butt joints as for first layer.

**Install Lower Framing To Engineer's Detail**

- Fix lower framing to upper framing at 200mm max. centres.

**All Bottom Layers**

- Offset recess joints from the previous layers. Offset butt joints between adjacent sheets and between layers.
- Refer to 1, 2 or 3 layer plasterboard fixing methods detailed in the previous pages of this guide.

# Junctions & Penetrations – Fire Rated

These details are suitable for Gyprock fire grade plasterboard, and are also suitable for non-fire rated applications and where acoustic integrity is required except where noted. For further information on services penetrations of walls, floors and ceilings refer to the Specification C3.15 of the Building Code of Australia (BCA).

Appraisal: EFWA 28014.

## Perimeter Junctions – Fire Rated Ceilings

Wall/ceiling junction details require engineer's approval where seismic loads apply. At ceiling/wall junctions, ceiling framing is required to support the plasterboard as detailed in Figure 291 to Figure 300. To seal the junction between the ceiling and wall, one of the caulking details Figure 301 to Figure 309 must be used. The junction detail should be selected with regard to appearance and acoustic integrity.

Figure 290: Ceiling Perimeter Framing And Caulking Selection

### Step 1:

Choose a suitable ceiling perimeter framing detail. Refer to Figure 291 to Figure 300.

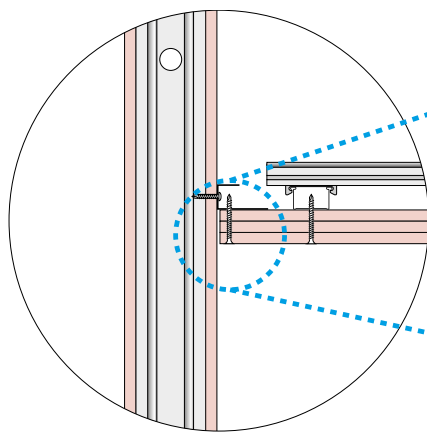


Figure 291:

### Step 2:

Choose a suitable perimeter caulking detail. Refer to Figure 301 to Figure 309.

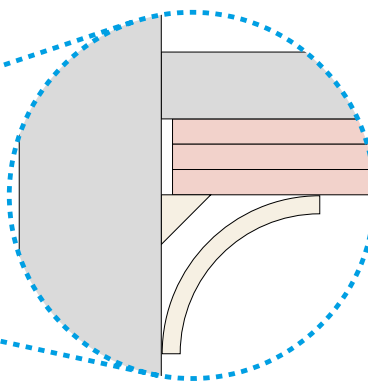


Figure 292:

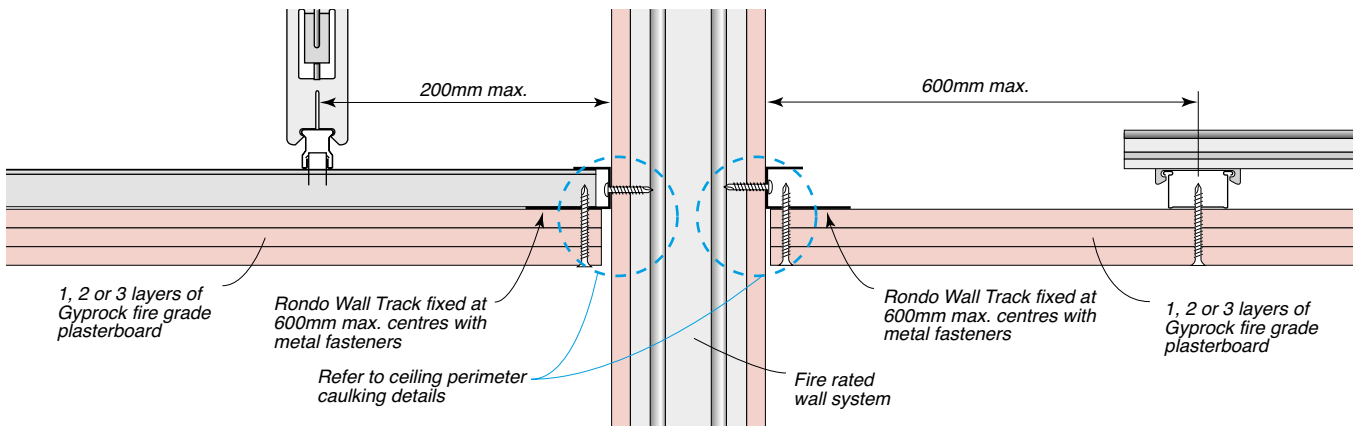


Figure 293:

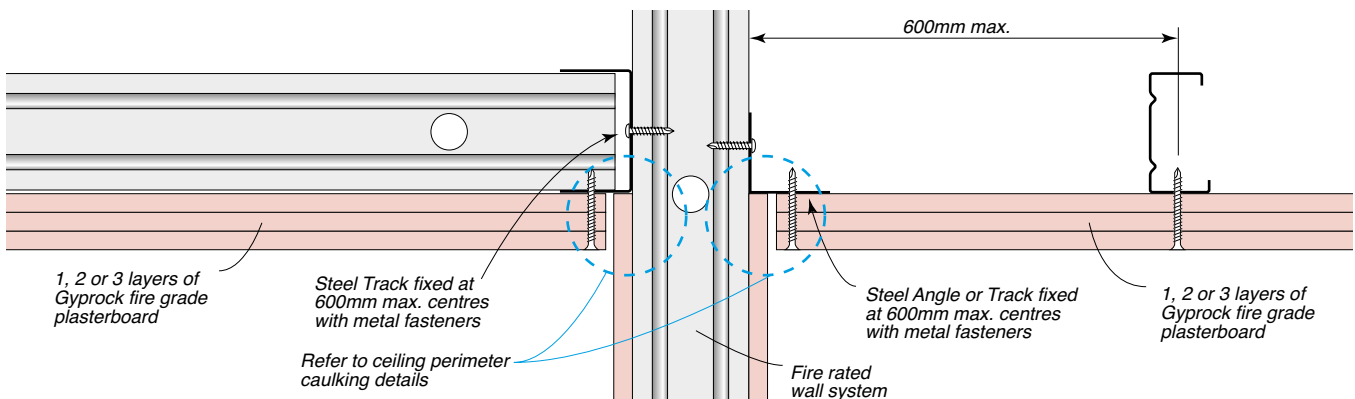


Figure 294:

Figure 295:

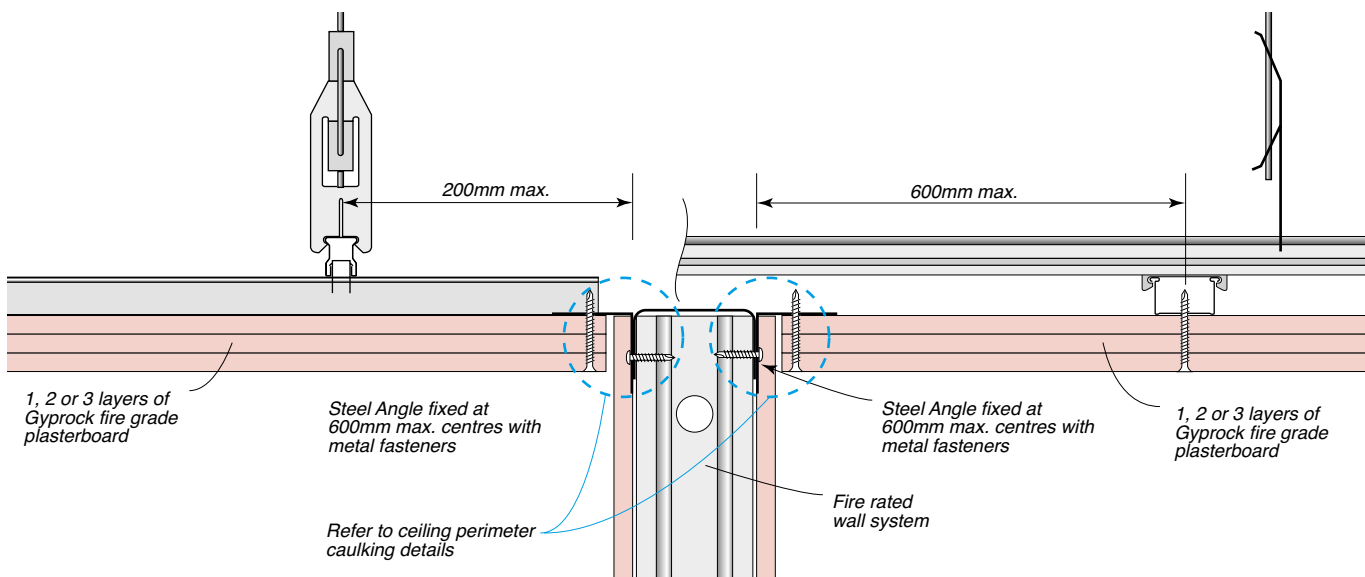


Figure 296:

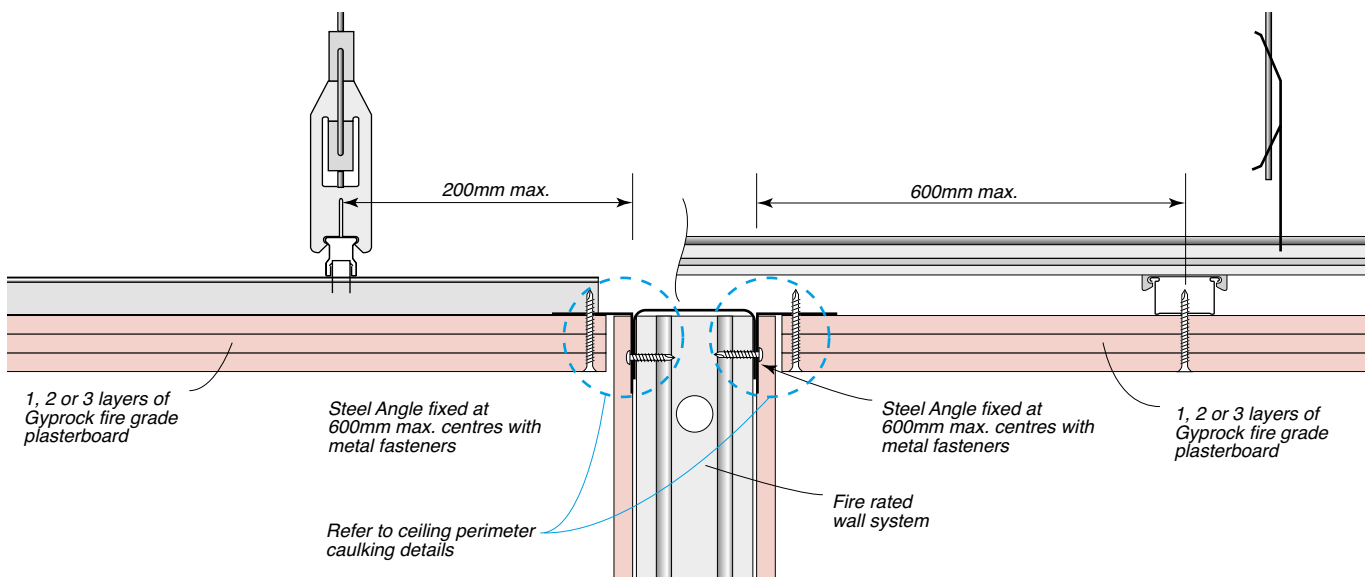


Figure 297:

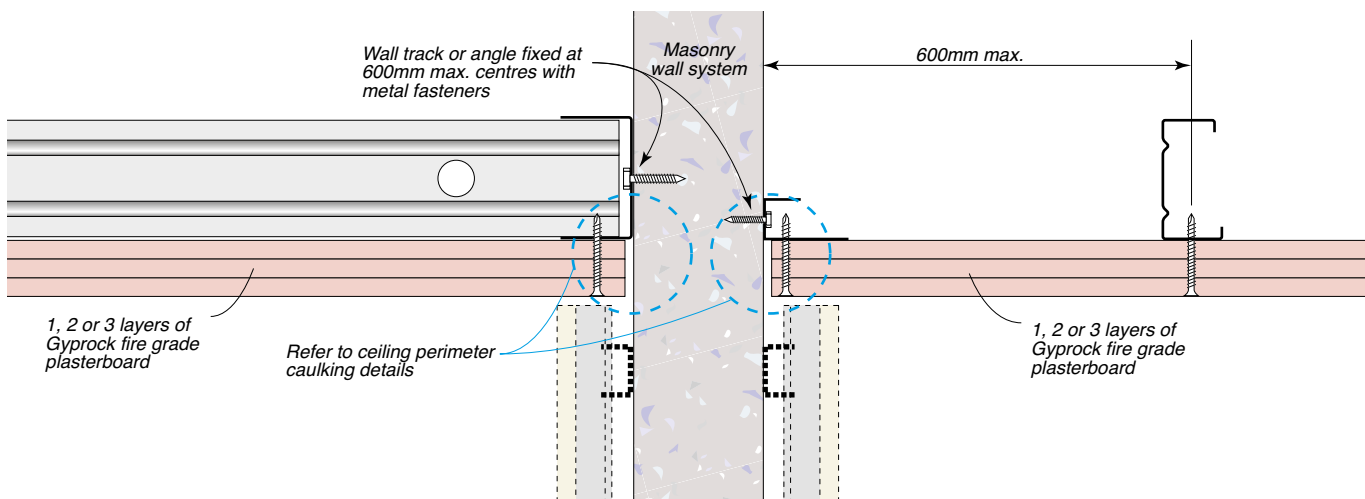


Figure 298:

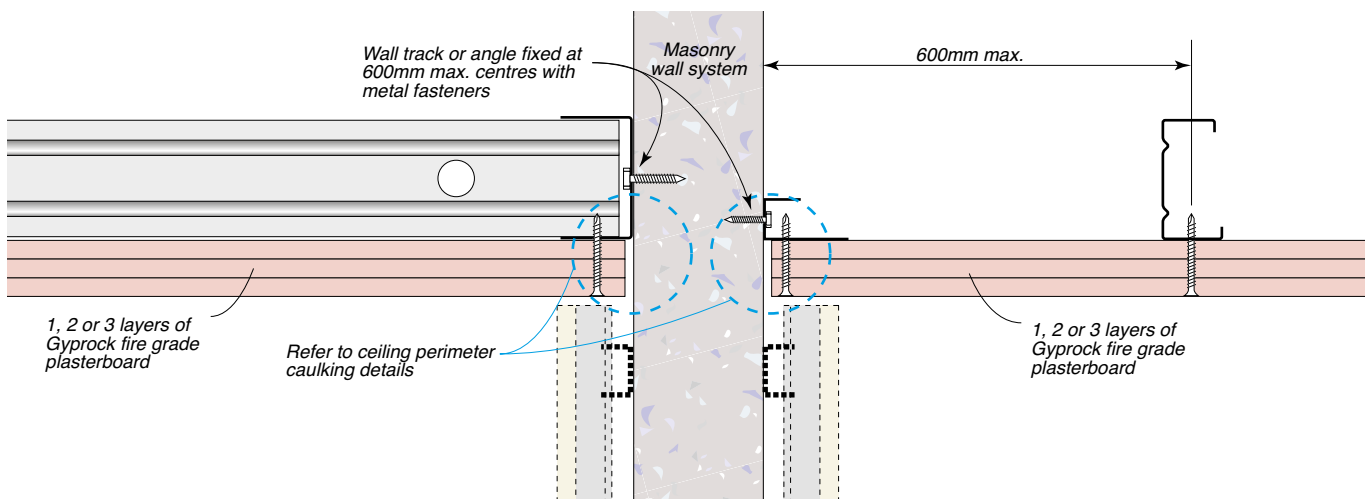


Figure 299:

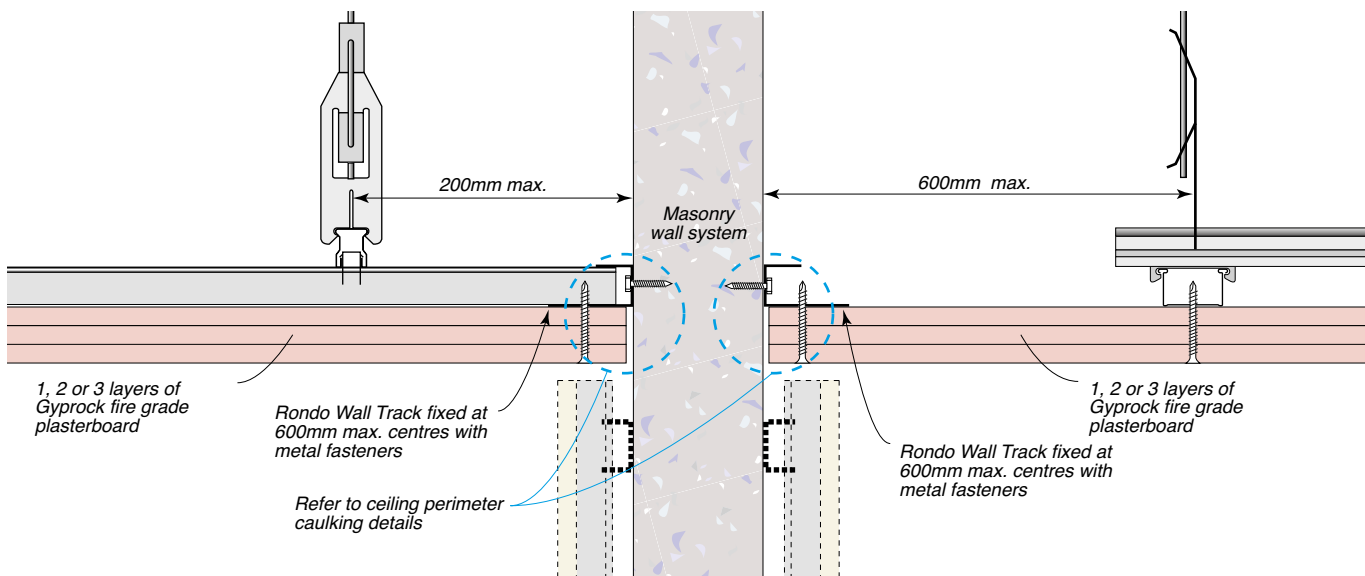
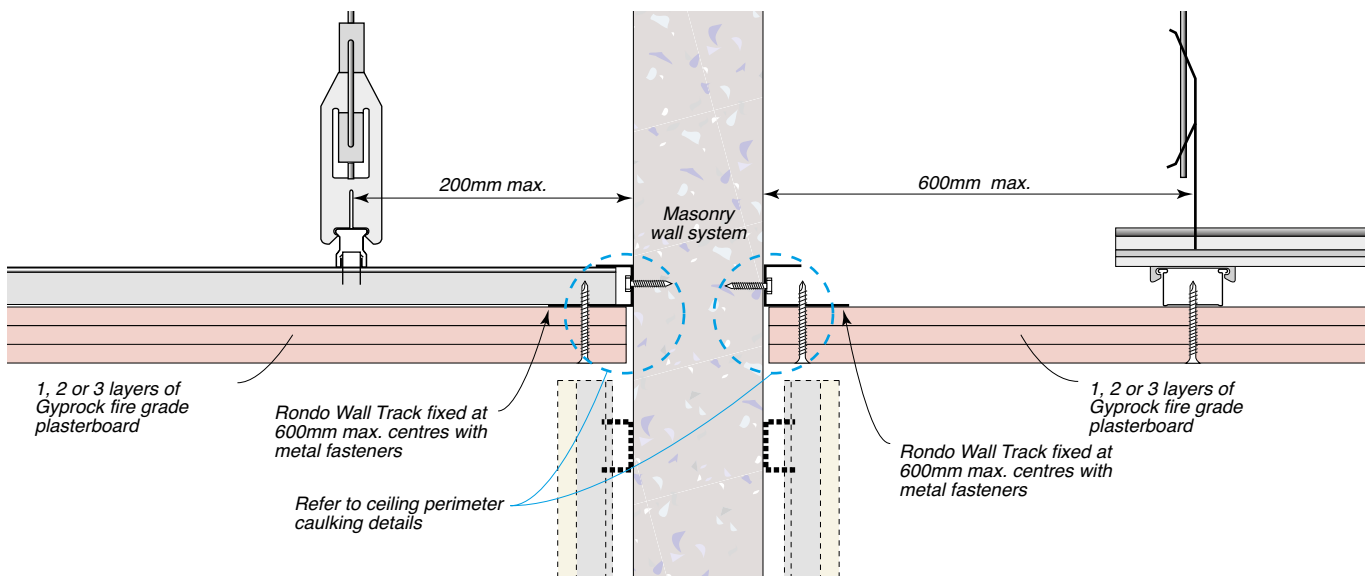


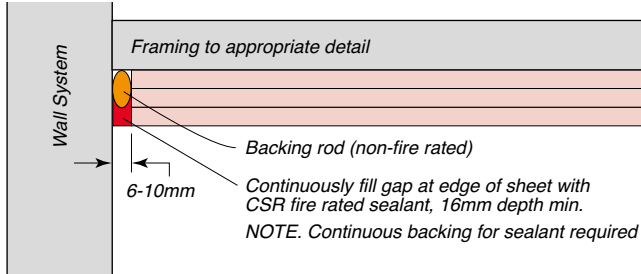
Figure 300:



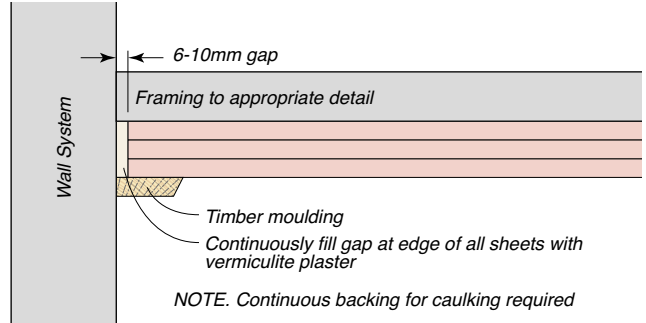
**Perimeter Caulking – Fire Rated Ceilings**

Perimeter caulking details Figure 301 to Figure 309 will maintain the FRL and RISF of the CSR Gyprock ceiling systems in which they are installed, except as noted. These details are also suitable where acoustic integrity is required, except as noted.

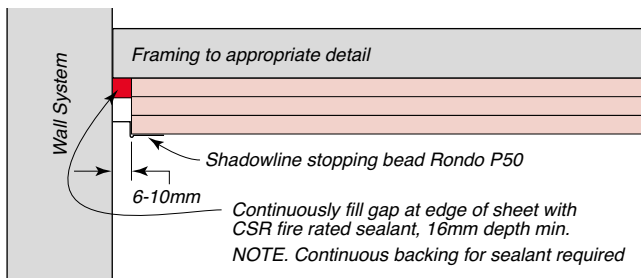
**Figure 301:** Suitable for 2 and 3 layer plasterboard ceiling systems.



**Figure 306:** Suitable for 1, 2 and 3 layer plasterboard ceiling systems.

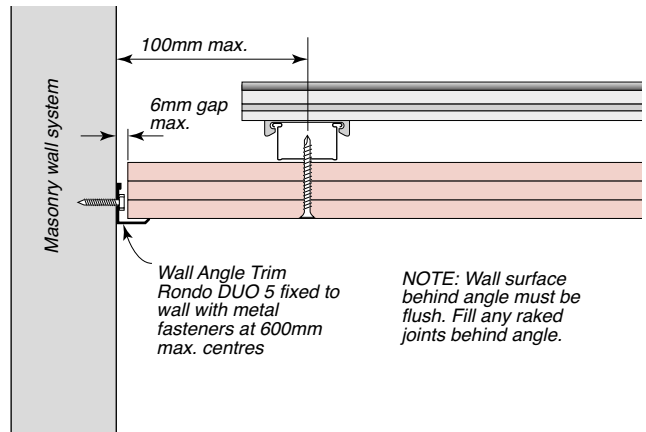


**Figure 302:** Suitable for 2 and 3 layer plasterboard ceiling systems.

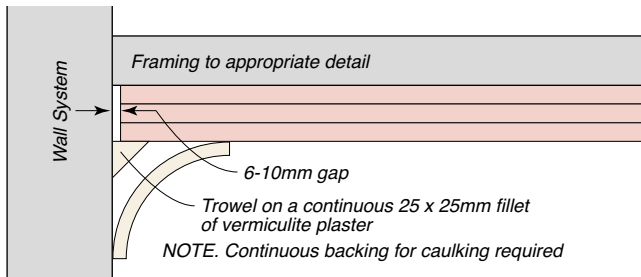


**Figure 307:**

Suitable for 1, 2 and 3 layer plasterboard ceiling systems.  
 NOT suitable for RISF 60 systems  
 NOT suitable where acoustic integrity is required.

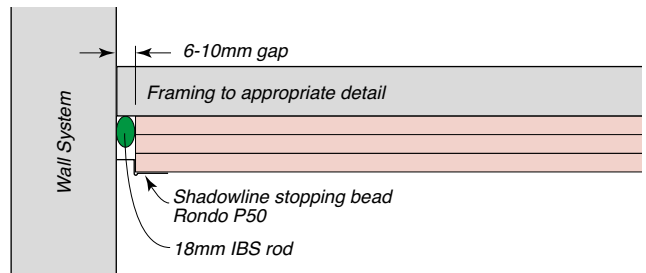


**Figure 303:** Suitable for 1, 2 and 3 layer plasterboard ceiling systems.

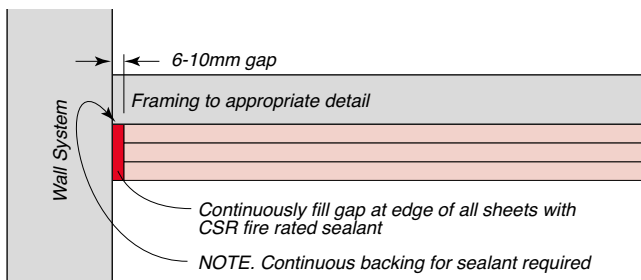


**Figure 308:**

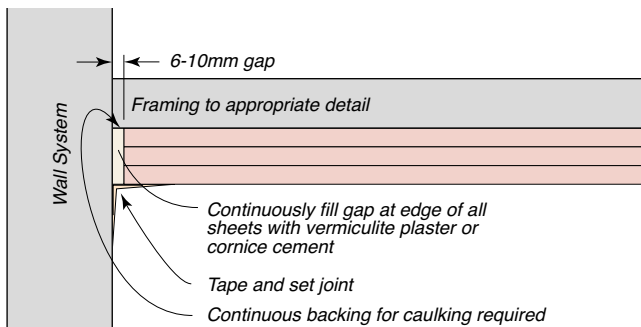
Suitable for 2 and 3 layer plasterboard ceiling systems.  
 NOTE: This detail is not suitable where acoustic integrity is required.



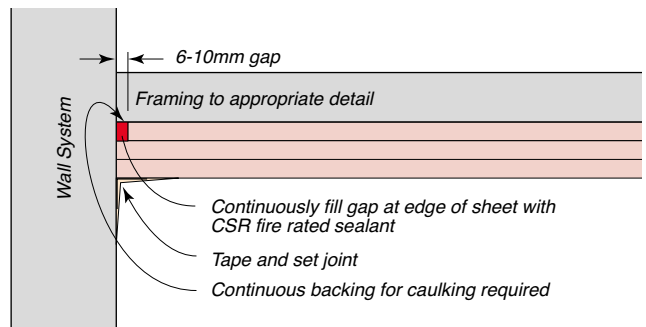
**Figure 304:** Suitable for 1, 2 and 3 layer plasterboard ceiling systems.



**Figure 305:** Suitable for 1, 2 and 3 layer plasterboard ceiling systems.



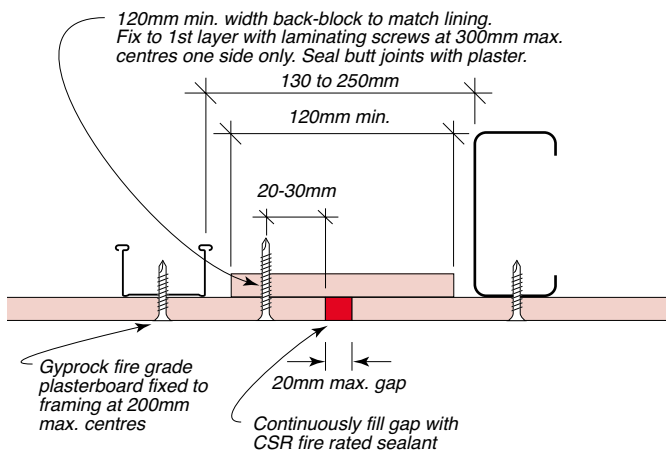
**Figure 309:** Suitable for 2 and 3 layer plasterboard ceiling systems.



Control Joints – Fire Rated Ceilings– Appraisal: EFWA 28014.

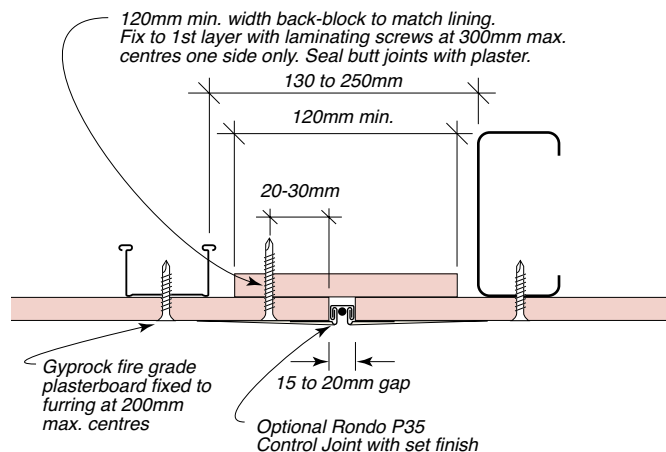
**Figure 310: Control Joint Parallel To Steel Framing – 1 Layer – Sealant Finish**

Maintains FRL of the ceiling system in which it is installed.



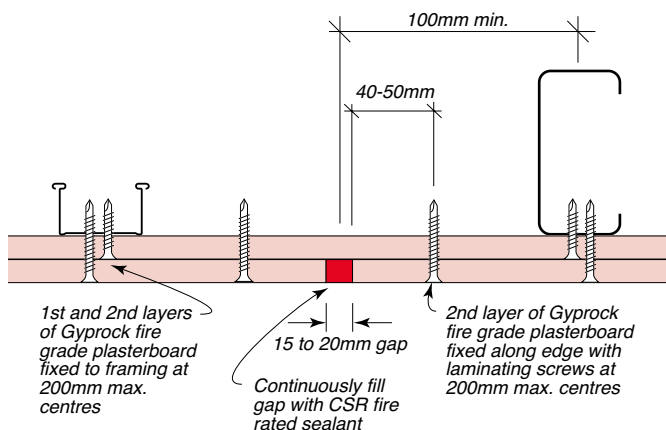
**Figure 313: Control Joint Parallel To Steel Framing – 1 Layer – Exposed Joint Or Set Bead Finish**

Maintains FRL of the ceiling system in which it is installed.



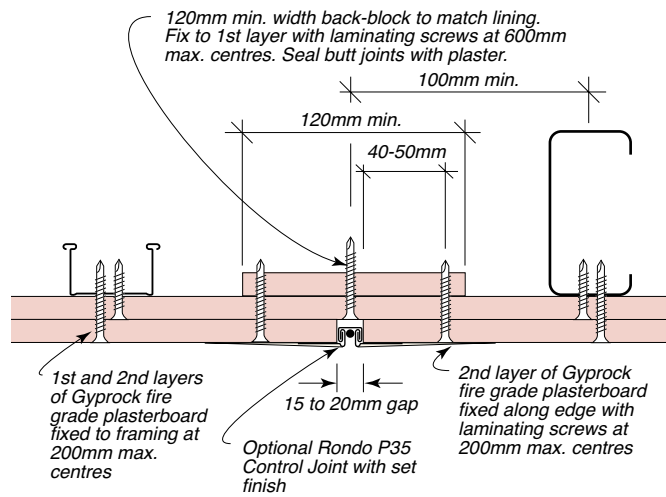
**Figure 311: Control Joint Parallel To Steel Framing – 2 Layers – Sealant Finish**

(Maintains FRL and RISF of the ceiling system in which it is installed).



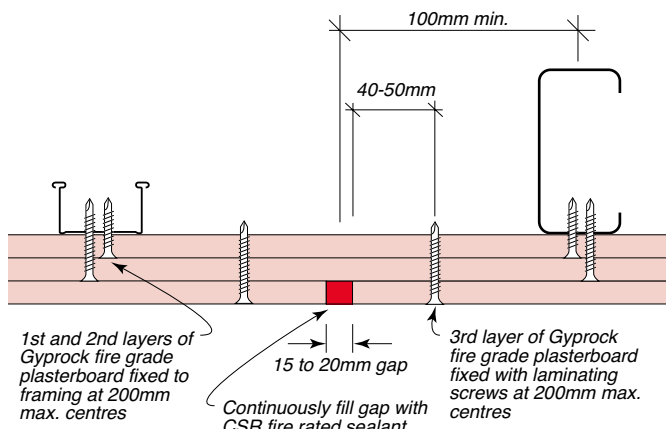
**Figure 314: Control Joint Parallel To Steel Framing – 2 Layers – Exposed Joint Or Set Bead Finish**

(Maintains FRL and RISF of the ceiling system in which it is installed).



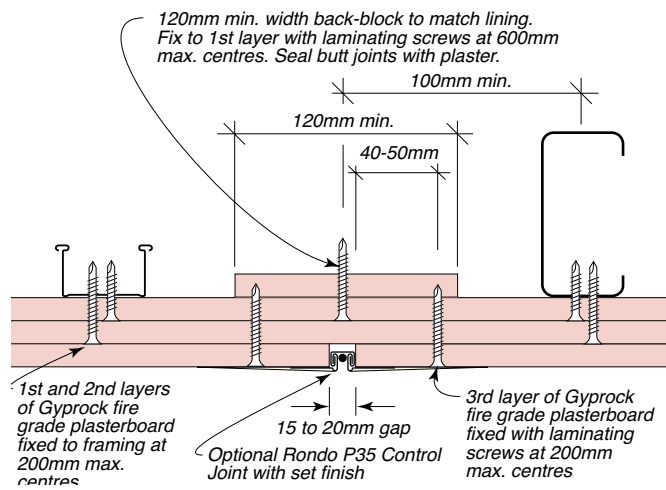
**Figure 312: Control Joint Parallel To Steel Framing – 3 Layers – Sealant Finish**

Maintains FRL of the ceiling system in which it is installed.



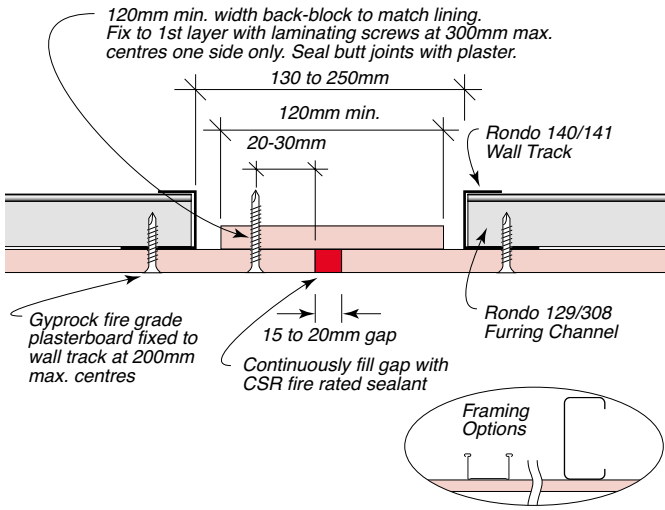
**Figure 315: Control Joint Parallel To Steel Framing – 3 Layers – Exposed Joint Or Set Bead Finish**

Maintains FRL of the ceiling system in which it is installed.



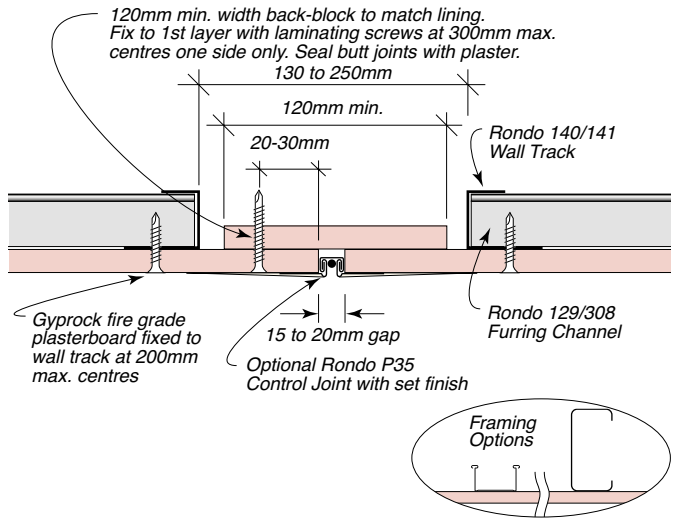
**Figure 316: Control Joint Perpendicular To Steel Framing – 1 Layer – Sealant Finish**

Maintains FRL of the ceiling system in which it is installed.



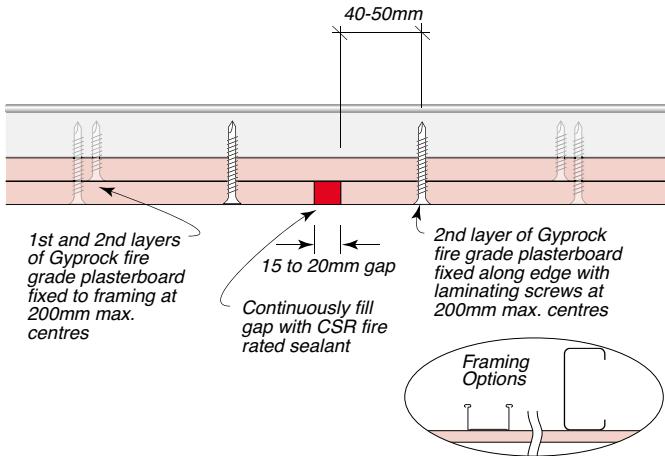
**Figure 319: Control Joint Perpendicular To Steel Framing – 1 Layer – Optional Set Bead Finish**

Maintains FRL of the ceiling system in which it is installed.



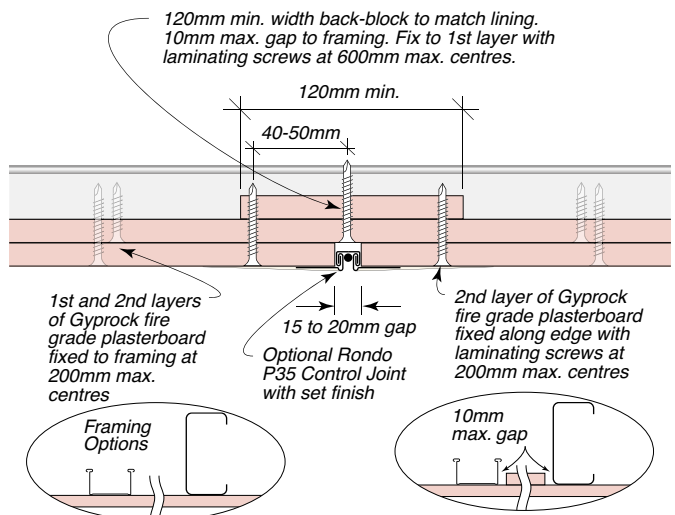
**Figure 317: Control Joint Perpendicular To Steel Framing – 2 Layers – Sealant Finish**

(Maintains FRL and RISF of the ceiling system in which it is installed).



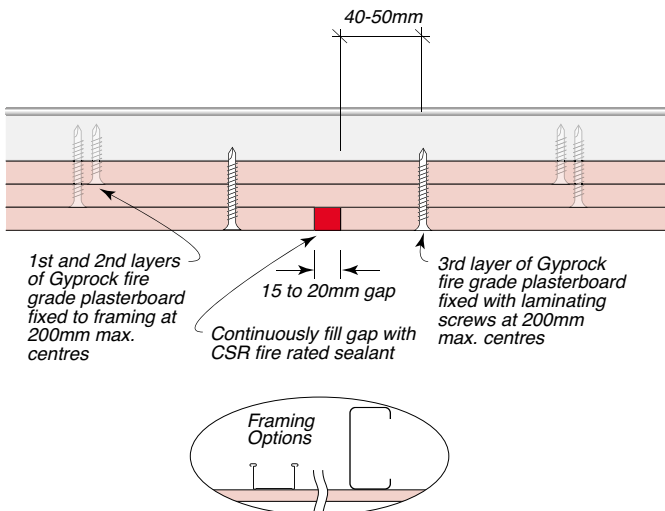
**Figure 320: Control Joint Perpendicular To Steel Framing – 2 Layers – Optional Set Bead Finish**

(Maintains FRL and RISF of the ceiling system in which it is installed).



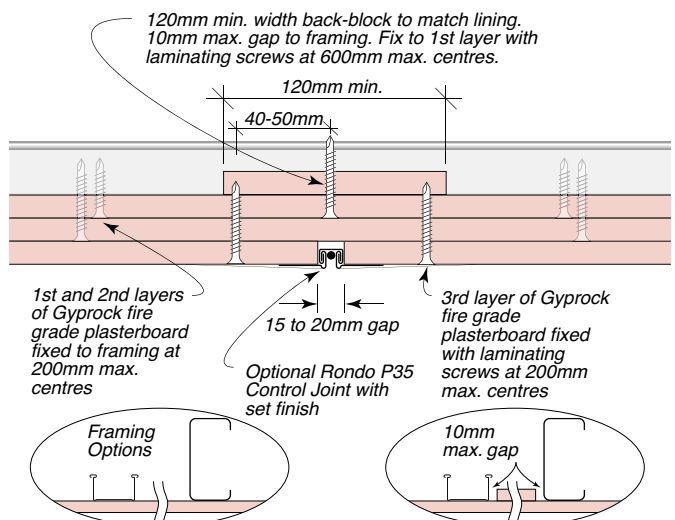
**Figure 318: Control Joint Perpendicular To Steel Framing – 3 Layers – Sealant Finish**

Maintains FRL of the ceiling system in which it is installed.



**Figure 321: Control Joint Perpendicular To Steel Framing – 3 Layers – Optional Set Bead Finish**

Maintains FRL of the ceiling system in which it is installed.





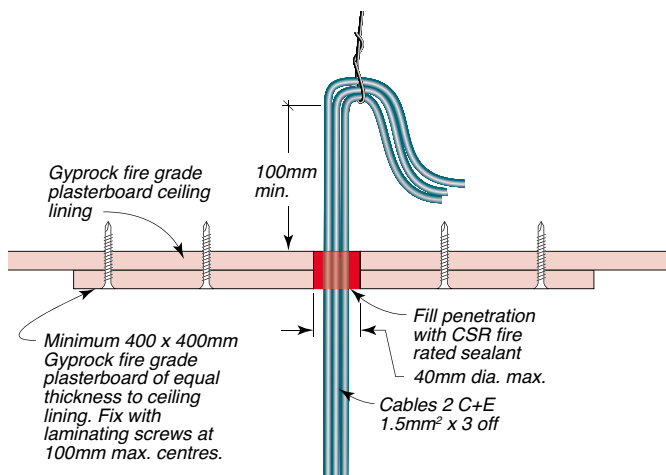
## Electrical Penetrations – Fire Rated Ceilings

Wall/ceiling junction details require engineer’s approval where seismic loads apply.

These details are suitable for Gyprock fire grade plasterboard that is part of a floor or roof ceiling system. They are also suitable for non-fire rated applications and where acoustic integrity is required. For further information on services penetrations of walls, floors and ceilings refer to the Clause C3.15 of the Building Code of Australia (BCA).

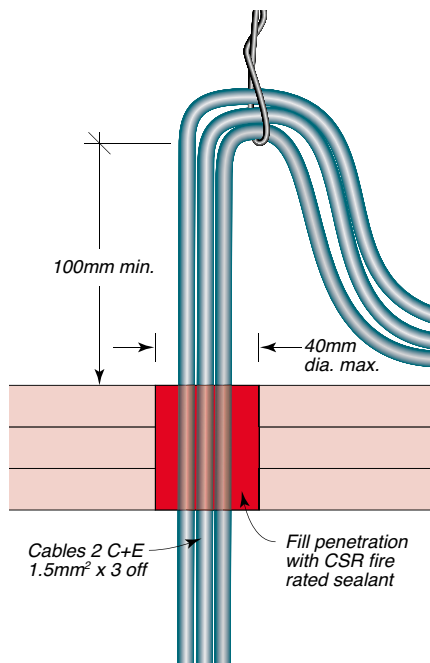
**Figure 322: Electrical Cable Penetration**

Suitable for 1 layer plasterboard ceiling systems.  
(Maintains FRL and RISF of the ceiling system were applicable.)



**Figure 323: Electrical Cable Penetration**

Suitable for 2 and 3 layer plasterboard ceiling systems.  
(Maintains FRL and RISF of the ceiling system were applicable.)

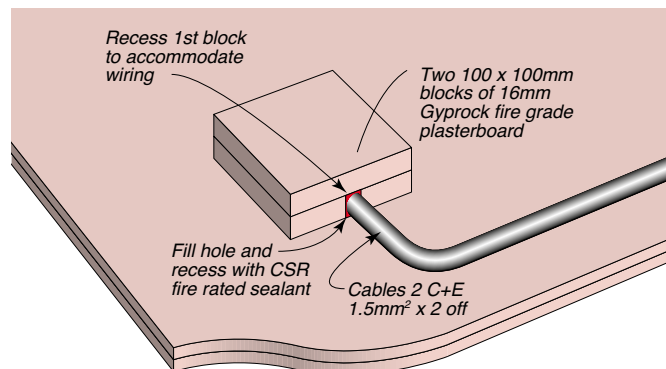


Alternately, where electrical wires or conduits penetrate a fire rated ceiling, the penetration must be back-blocked with two 100 x 100mm pieces of 16 mm Gyprock fire grade plasterboard.

Recess the lower piece to accommodate the wiring, and fix both blocks in position with Gyprock Cornice Cement or Gyprock Base Coat 45/60/90. Fill recess with Gyprock Fire Mastic or CSR FireSeal.

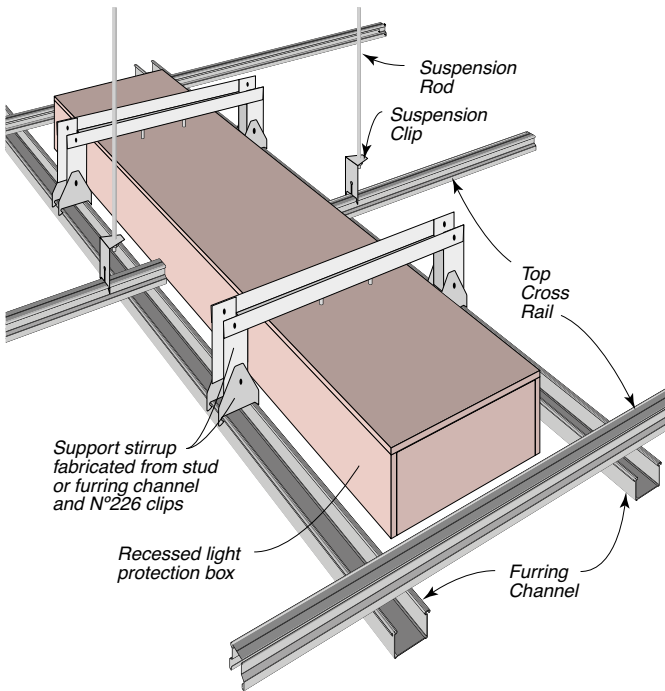
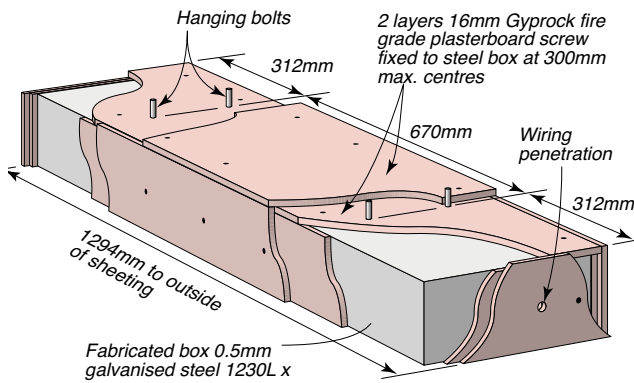
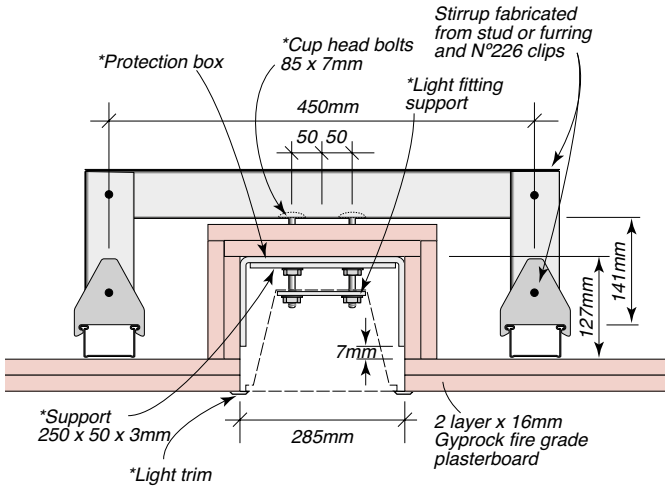
**Figure 324: Back-Blocking Of Electrical Penetration On Ceiling**

Suitable for 1, 2 and 3 layer plasterboard ceiling systems.  
(Maintains FRL and RISF of the ceiling system were applicable.)

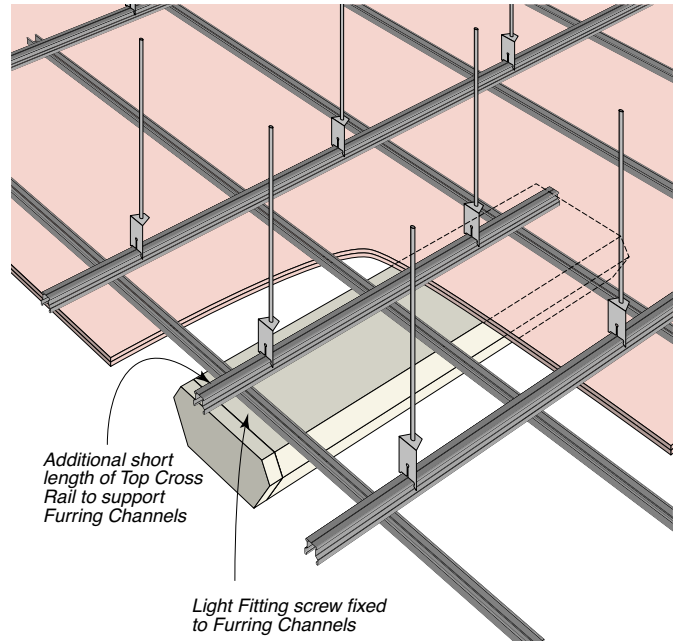


**Figure 325: Recessed Light Box In Suspended Steel Frame Ceiling**

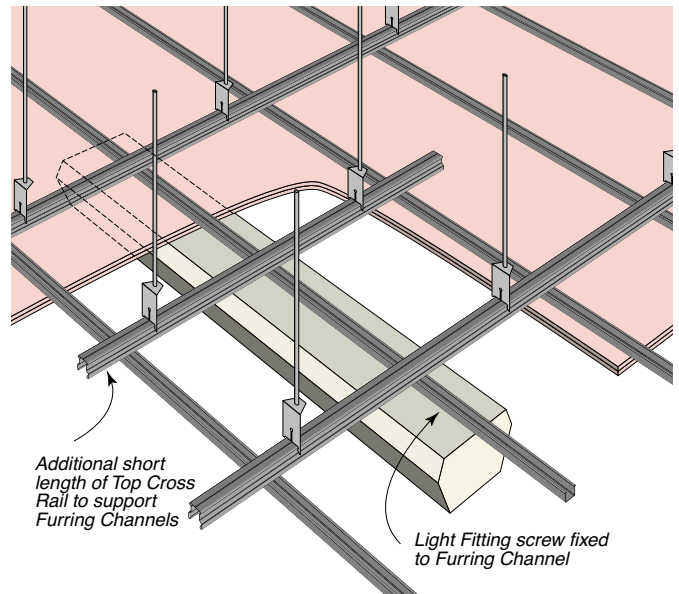
Suitable for 1, 2 and 3 layer plasterboard ceiling systems.  
 (Maintains FRL and RISF of the ceiling system in which it is installed).  
 (\*Components not supplied by CSR)



**Figure 326: Surface Mounted Light Perpendicular To Furring Channels**

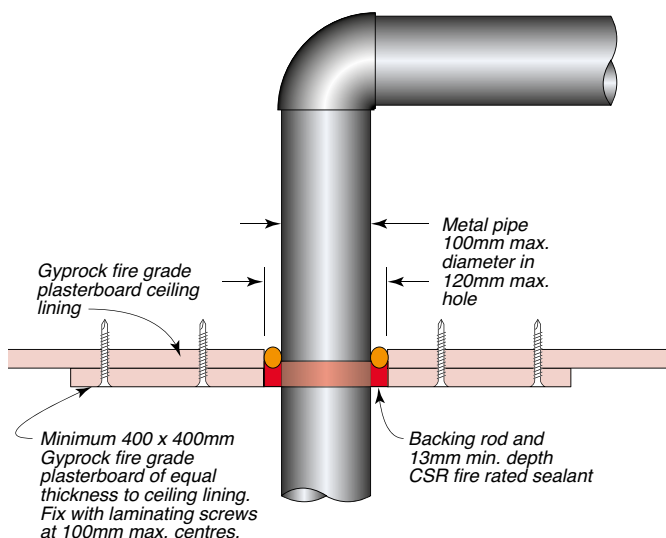


**Figure 327: Surface Mounted Light Parallel To Furring Channels**



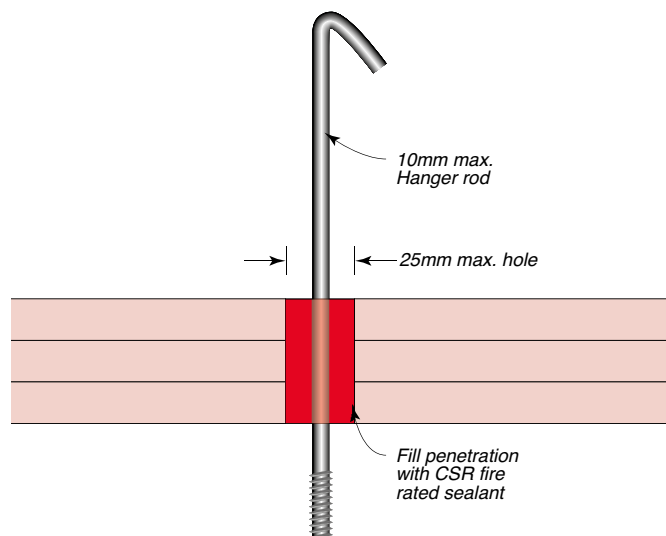
### Pipe Penetrations

**Figure 328: Metal Pipe Penetration Through 1 Layer Ceiling**  
 (Maintains FRL and RISF of the ceiling system were applicable.)  
 Appraisal: EWFA 28014.

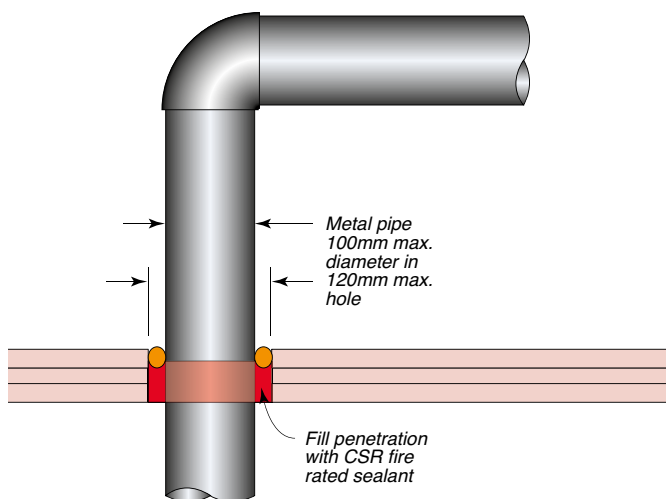


### General Penetrations

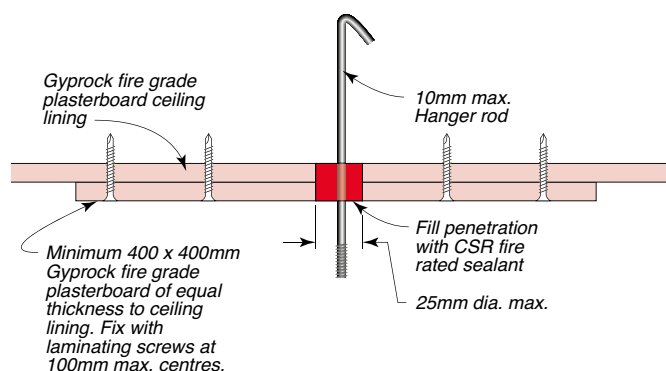
**Figure 330: Hanging Rod Through 2 Or 3 Layer Ceiling**  
 (Maintains FRL and RISF of the ceiling system were applicable.)  
 Appraisal: EWFA 28014.



**Figure 329: Metal Pipe Penetration Through 2 Or 3 Layer Ceiling**  
 (Maintains FRL and RISF of the ceiling system were applicable.)  
 Appraisal: EWFA 28014.



**Figure 331: Hanging Rod Through 1 Layer Ceiling**  
 (Maintains FRL and RISF of the ceiling system were applicable.)  
 Appraisal: EWFA 28014.



## Penetrations In Ceilings – Proprietary Systems

Details Figure 332 to Figure 336 contain proprietary components and are not subject to appraisals by CSR. For specifications, installation details, and fire performance, refer to the appropriate component supplier.

Figure 332: Typical PVC Pipe Penetration

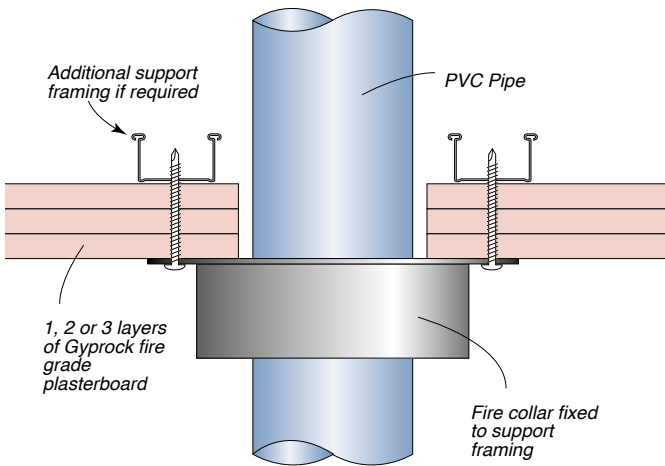


Figure 333: Typical Fire Rated Downlight



Figure 334: Typical Control Joint In C-H Stud Ceiling Framing Lined Two Sides

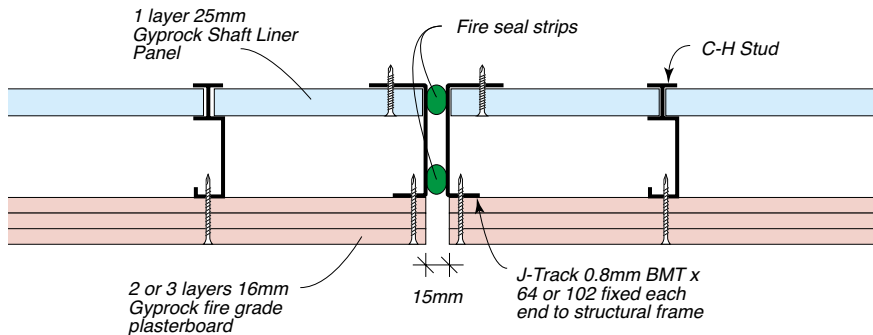


Figure 335: Typical Fire Hatch In Ceiling

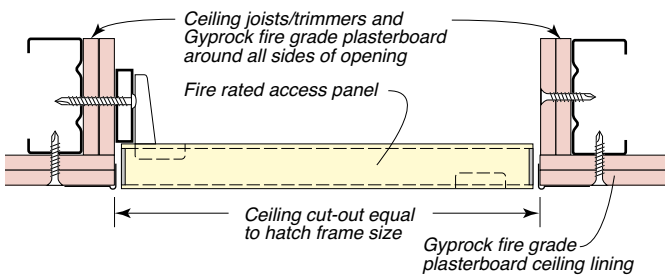
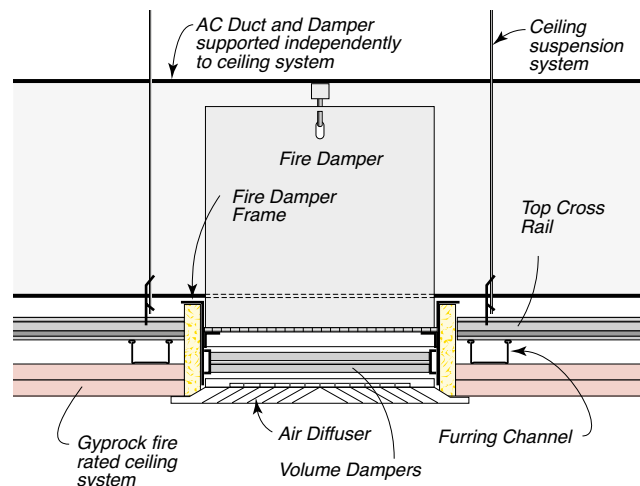


Figure 336: Typical Air Conditioning Damper To Ceiling





# Gyprock Perforated Plasterboard Systems

## Introduction

Gyprock's expanded perforated plasterboard range includes Rigitone and Gyptone products, delivered as a result of an international alliance with worldwide plasterboard specialist Saint-Gobain. On installation, Gyprock Rigitone creates a flat, seamless perforated pattern, available in four designs with acoustic fabric backing. Gyprock Gyptone produces a more traditional grid-based perforated pattern, offering three designs with acoustic fabric backing and matching access panels. For additional design freedom, Gyptone 12mm Square and Slotted Minigrad are available in flexible format, making them ideal for curved installation.

## Applications

Gyprock perforated plasterboard products are available in a range of attractive patterns and provide a unique design element for acoustic ceiling and wall\* projects. These products should be installed and used in areas with a relative humidity not exceeding 70% for prolonged periods. Perforated plasterboard is ideal for installation in nearly every environment where acoustic performance is required, including;

- Educational facilities.
- Cafeterias.
- Offices and conference centres.
- Healthcare industries.
- Hotels.
- Cultural and community spaces.
- Airports.
- Retail environments.



(\*Not suitable for impact resistant applications).

## Perforated Plasterboard Options

Gyprock perforated plasterboard is available in three ranges. The premium Rigitone and Gyptone ranges feature patented Activ'Air technology, which converts formaldehyde into non-harmful inert compounds that are permanently locked in the board and cannot be released back into the air. Controlled testing has shown that Activ'Air can reduce the concentration of formaldehyde within a chamber by up to 60% even when there is continuous airflow containing formaldehyde. Gyprock's Standard range encompasses the standard 6mm Round pattern.

### Rigitone Range

Rigitone perforated plasterboard contributes significantly to aesthetics, good acoustics and improved indoor air quality. These 12.5mm thick boards are available in a range of four contemporary perforation patterns, with acoustic fabric backing and open areas to meet most acoustic application requirements, delivering a seamless perforated ceiling design. Installed with a unique jointing system, all edges of the boards are pre-primed to improve jointing speed, and corresponding installation tools are available. These products also feature innovative Activ'Air technology to help improve indoor air quality.

### Gyptone Range

Gyptone perforated plasterboard contributes to aesthetics, good acoustics and improved indoor air quality. With a range of three contemporary perforation patterns available delivering a grid-based design, including two options for curved installations, these 2400mm x 1200mm x 12.5mm boards

feature acoustic fabric backing and open areas to meet most acoustic requirements. All edges of the traditional boards are recessed to make jointing easy and matching 510mm x 510mm access panels ensure a cohesive look across the space in flat installations. Gyptone Flexible products are 6.5mm thick and feature two long recessed edges. All Gyptone products feature innovative Activ'Air technology to help improve indoor air quality.

### Standard Range

This simple, geometric pattern is available in 3600mm x 1200mm x 13mm sheets with recessed long edges. Standard 6mm Round is supplied with no acoustic fabric, and can be installed as-is for entry-level acoustic performance with an aesthetic impact on the environment.

### Additional Information

For comprehensive detail on the acoustic performance and pattern set-outs of the Gyprock perforated plasterboard range, please see the Perforated Plasterboard range brochure GYP549, available from [www.gyprock.com.au](http://www.gyprock.com.au) or through your local Gyprock Account Manager.

For technical assistance with the Gyprock perforated plasterboard range, please contact DesignLINK, [designlink@csr.com.au](mailto:designlink@csr.com.au) or call 1800 621 117.



# Gyprock Perforated Plasterboard

The Gyprock range of perforated plasterboard helps to create ceilings that achieve high levels of acoustic performance with an aesthetic focus. The panel perforations and acoustic fabric backing when applied, effectively absorb sound to reduce echo and noise reverberation. Some Gyprock Gyptone and Rigitone perforated plasterboard may also be installed on walls. (Not suitable for impact resistant applications).

Table 43: Gyprock Perforated Plasterboard Features, Applications & Specifications

Gyprock Perforated Products	Applications – Walls & Ceilings	Sheet Size (mm)	Sheet Thickness (mm)	Mass kg/m <sup>2</sup>	Suitable For Walls	Suitable For Ceilings	Acoustic Fabric
	Features						
<b>Rigitone Range</b>							
Gyprock Rigitone Matrix 8mm Round	<ul style="list-style-type: none"> <li>Perforated gypsum board with a grid pattern of 8mm round perforations spaced at 18mm centres, providing a 15.5% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> <li>Matching access panel 510 x 510mm available.</li> </ul>	1998 x 1188	12.5	10	✓	✓	Black
Gyprock Rigitone Matrix 12mm Square	<ul style="list-style-type: none"> <li>Perforated gypsum board with a grid pattern of 12mm square perforations spaced at 25mm centres, providing a 23% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> <li>Matching access panel 510 x 510mm available.</li> </ul>	2000 x 1200	12.5	9.5	✓	✓	Black
Gyprock Rigitone Astral	<ul style="list-style-type: none"> <li>Perforated gypsum board with a regularly staggered pattern consisting 12mm and 20mm round perforations spaced at 33mm centres, providing a 19.6% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> <li>Matching access panel 510 x 510mm available.</li> </ul>	1980 x 1188	12.5	9.5	✓	✓	Black
Gyprock Rigitone Galaxy	<ul style="list-style-type: none"> <li>Perforated gypsum board with an irregular scattered pattern consisting 8mm, 15mm and 20mm round perforations, providing a 10% open area.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Unique jointing method to provide a continuous pattern once finished.</li> <li>Matching access panel 510 x 510mm available.</li> </ul>	1960 x 1200	12.5	10	✓	✓	Black
<b>Gyptone Range</b>							
Gyprock Gyptone 12mm Square	<ul style="list-style-type: none"> <li>Perforated gypsum board with square holes of 12mm x 12mm.</li> <li>Total perforated area of 16%.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Integrated 510 x 510mm access hatch available.</li> </ul>	2400 x 1200	12.5	8	✓	✓	Black
Gyprock Gyptone 12mm Square Minigrid	<ul style="list-style-type: none"> <li>Perforated gypsum board with square holes of 12mm x 12mm set in a mini grid layout.</li> <li>Total perforated area of 6%.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Integrated 510 x 510mm access hatch available.</li> </ul>	2400 x 1200	12.5	8	✓	✓	Black
Gyprock Gyptone Slotted Minigrid	<ul style="list-style-type: none"> <li>Perforated gypsum board with rectangular holes of 6mm x 80mm.</li> <li>Total perforated area of 13%.</li> <li>Supplied with black acoustic fabric backing.</li> <li>Integrated 510 x 510mm access hatch available.</li> </ul>	2400 x 1200	12.5	8	✓	✓	Black
Gyprock Gyptone Flexible Slotted Minigrid	<ul style="list-style-type: none"> <li>Flexible board suitable for curving to 1.2m minimum radius.</li> <li>Perforated gypsum board with rectangular holes of 6mm x 80mm.</li> <li>Total perforated area of 13%.</li> <li>Supplied with black acoustic fabric backing.</li> </ul>	2400 x 1200	6.5	6.5	✗	✓	Black
Gyprock Gyptone Flexible 12mm Square	<ul style="list-style-type: none"> <li>Flexible board suitable for curving to 1.2m minimum radius.</li> <li>Perforated gypsum board with square holes of 12mm x 12mm.</li> <li>Total perforated area of 16%.</li> <li>Supplied with black acoustic fabric backing.</li> </ul>	2400 x 1200	6.5	6.5	✗	✓	Black
<b>Gyprock Standard Range</b>							
Gyprock 6mm Round	<ul style="list-style-type: none"> <li>Perforated gypsum board with round holes of 6mm diameter.</li> <li>Total perforated area of 8.3%.</li> <li>GECA accredited.</li> </ul>	3600 x 1200	13	10	✓	✓	NIL

# Rigitone Perforated Ceiling System For Flat Installations

## Design Considerations

- Choose a board and confirm the size.
- Determine the ceiling area.
- Plan the ceiling grid and furring channel layout based on Table 44 and the size of the decorative border. Refer to Figure 338 and Figure 345.
- When required, plan for a decorative border using 13mm Gyprock Standard Plasterboard. For perimeter details refer to Figure 341, Figure 342 and Figure 343.
- Adequate independent or additional support must be provided for services and lighting systems.
- Diagonal bracing may be required to resist earthquake actions. Refre to Rondo for details.

Table 44: Furring Channel Spacing – Rigitone

Product	Furring Channel Spacing
Gyprock Rigitone Matrix 8mm Round	333
Gyprock Rigitone Matrix 12mm Square	333
Gyprock Rigitone Astral	330
Gyprock Rigitone Galaxy	327

## Concealed Grid Ceiling Suspension System

Gyprock Rigitone perforated boards may be fixed directly to steel furring which is part of a concealed grid suspended ceiling frame as detailed in Figure 338.

These systems are NON-TRAFFICABLE and are not designed to resist the weight of foot traffic. Where access to the ceiling area is required, install a Rondo Walkabout Ceiling System.

Gyprock Suspended Ceiling Systems comprise suspension brackets fixed to the supporting structure, suspension rods, suspension clips, top cross rails, and a locking key for coupling to the furring channel. Refer to Figure 337.

Rondo N°155 furring channels must be used at all board joints. Rondo N°129 furring channels are narrower and may be used at other locations.

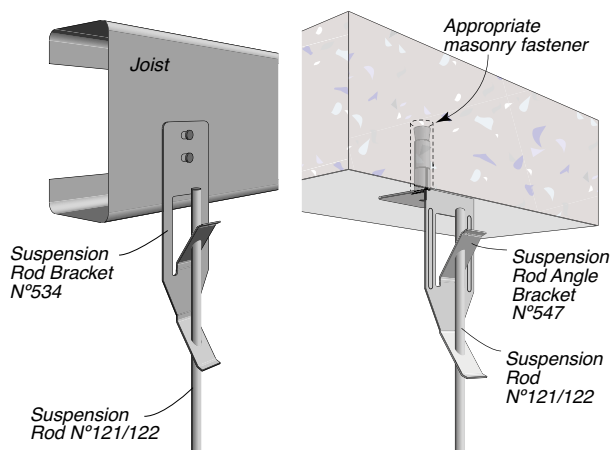
Where Top Cross Rails are not continuous, they must be joined as shown in the suspended ceiling components details. Joins must be aligned with hanging points.

For installation requirements, refer to details in this guide and Rondo Building Services specifications.

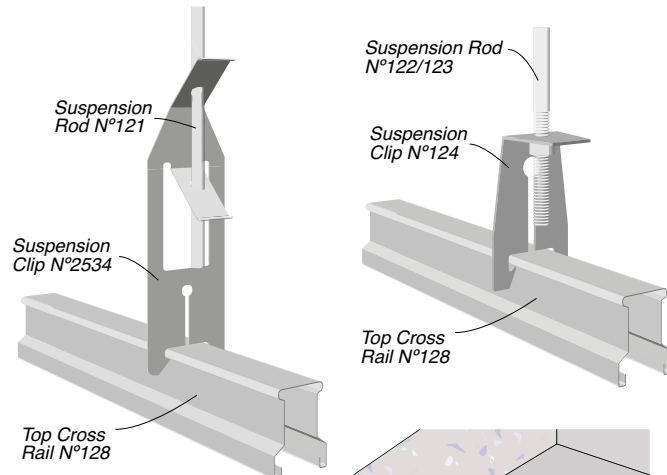
Figure 337: Key-Lock Concealed Grid Suspended Ceiling Components

(Refer to Rondo Building Services literature for additional information)

### Suspension Brackets



### Suspension Clips



### Joiners

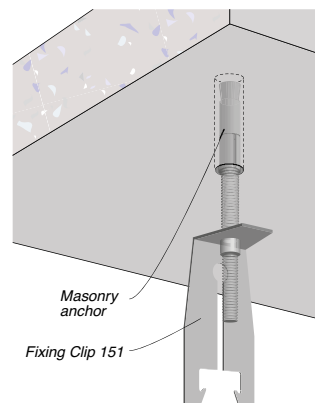
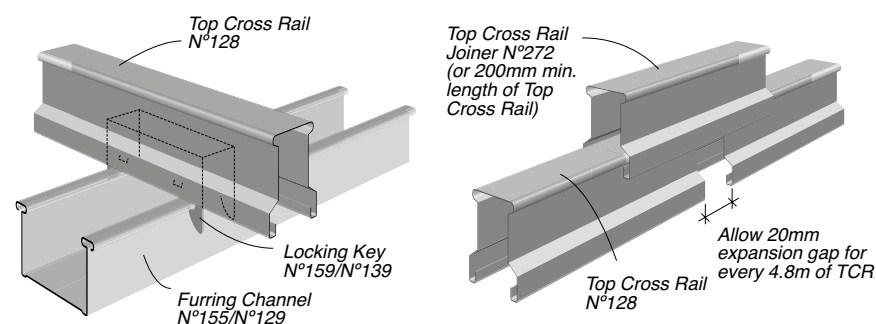
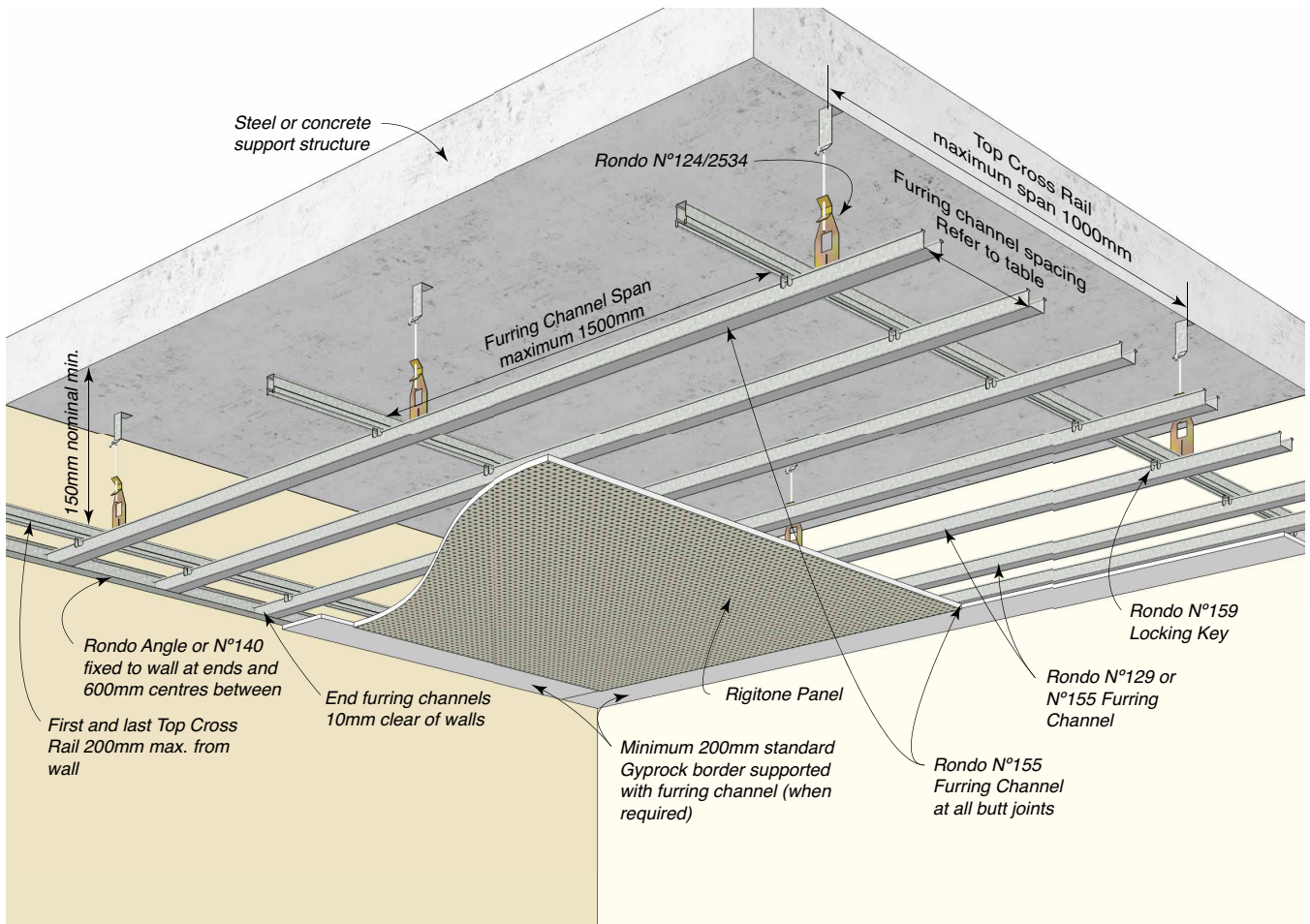


Figure 338: Rigitone Concealed Grid Suspended Ceiling



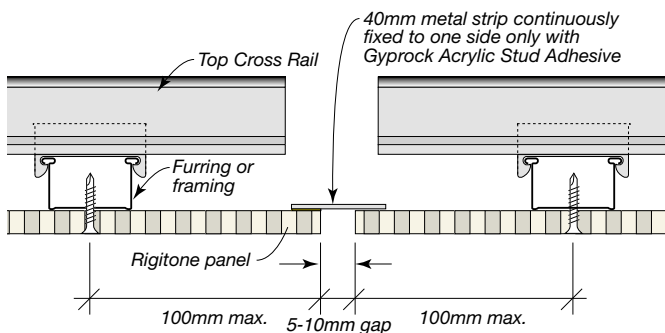
**Control Joints**

Gyprock Rigitone installations require control joints to be installed at 10m maximum centres in both directions.

Control joints are also to be provided:

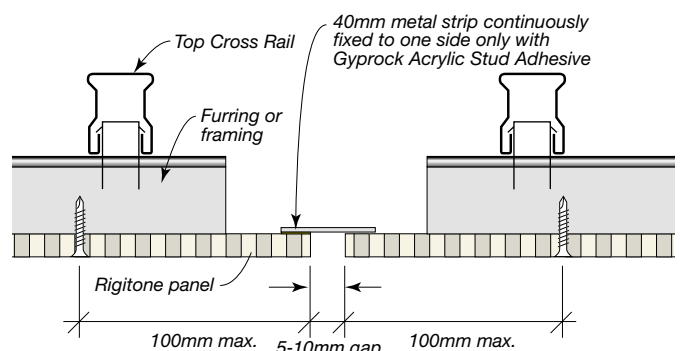
- At all construction joints of the building
- At junctions with other building elements
- At changes of structural support systems
- Other locations as specified.

Figure 339: Control Joint – Parallel To Furring Channel



NOTE: To maintain appearance, ensure Gyprock Acrylic Stud Adhesive does not intrude into the gap.

Figure 340: Control Joint – Perpendicular To Furring Channel



NOTE: To maintain appearance, ensure Gyprock Acrylic Stud Adhesive does not intrude into the gap.

## Perimeter Details

Gyprock Rigitone ceilings can be finished in a range of perimeter details. Rigitone panels (even with a standard plasterboard border) should not be fixed to perimeter walls as the suspended ceiling system must be able to move independently of the structure.

Figure 341: Perimeter Detail – Wall Angle Trim

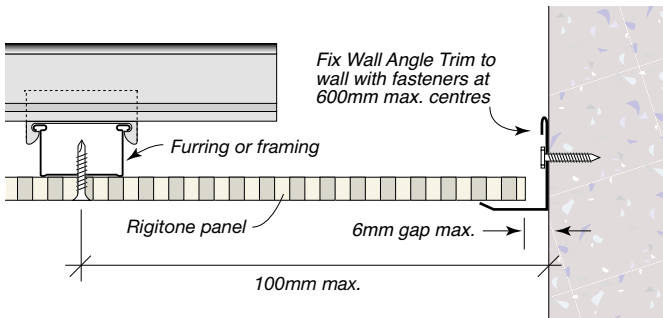


Figure 342: Perimeter Detail – Shadowline

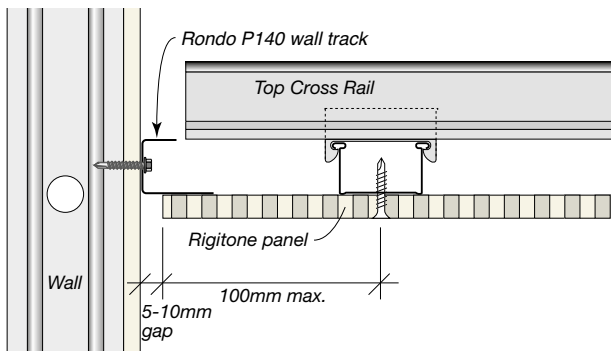
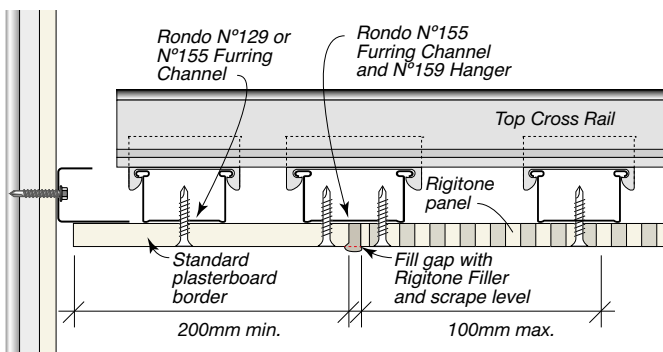


Figure 343: Perimeter Detail – Standard Plasterboard Border



## Installation Overview

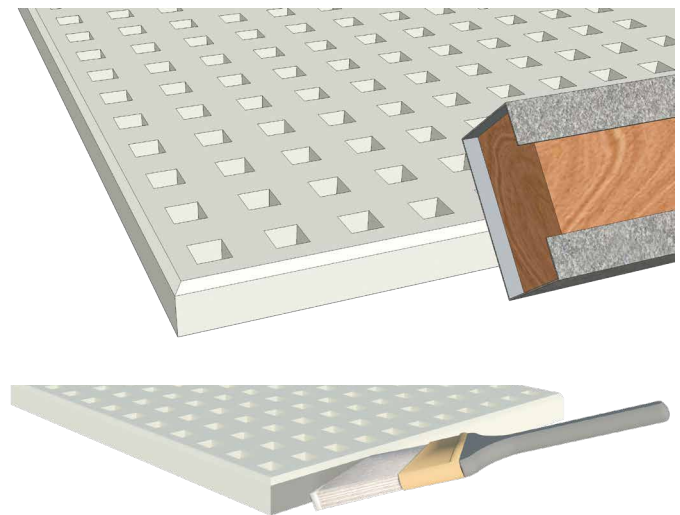
1. Install boards from the centre of the room with the long edge of the boards at right angles to the furring channels.
  2. Use the pattern specific spacer tool, to ensure the correct alignment of the boards.
  3. Screw fix boards in accordance with this guide.
  4. Fill gaps between boards using Rigitone Filler in conjunction with the specialised Rigitone Filler Accessories Kit, barrel gun and nozzles. Allow to dry for approximately 20-30 minutes.
  5. Cover all screw heads using Rigitone Filler and the screw filler template from the Accessories Kit. Allow to dry for approximately 20-30 minutes.
  6. Scrape off excess filler from joints and screw heads.
  7. Sand joints and screw heads.
  8. Paint and finish as required.
- NOTE: For all cut boards, bevel the cut edges, then paint the edges with Rigitone Primer.

## Installation Procedure

### Board Preparation

When required, boards are to be cut using a hand or power saw. It is not recommended to score and snap Gyprock Rigitone boards. Prepare any cut edges by bevelling them slightly using a hand sander and then apply Rigitone Primer sealing agent to all cut board edges.

Figure 344: Preparing Rigitone Boards



**Board Layout & Installation**

Mount the first board in the centre of the room. Use an alignment line or preferably a fixed edge guide to ensure the board is properly aligned before screwing it into place. Refer to Figure 345.

Rigitone boards must be installed with the long edges at right angles to the furring channels and ends of boards must be supported by furring channels.

Boards should be fastened into place using Gyprock 6g x 25mm needle point screws at 15mm min. from board ends, 50mm minimum from the long edges and at 170mm max. centres. Refer to Figure 346.

Always fasten the short edges of the board first, then the long edges and body.

Ensure boards are level and in full contact with the furring channel before screw fixing. Refer to Figure 347.

Any slight unevenness in the surface under the boards can be compensated by loosening the screws slightly.

Work outwards from the centre of the room in a star pattern when mounting subsequent boards, making sure that they are all laid in the same direction (see markings on the ends and lettering on the long edges of the boards).

Figure 346: Rigitone Board Fixing Locations

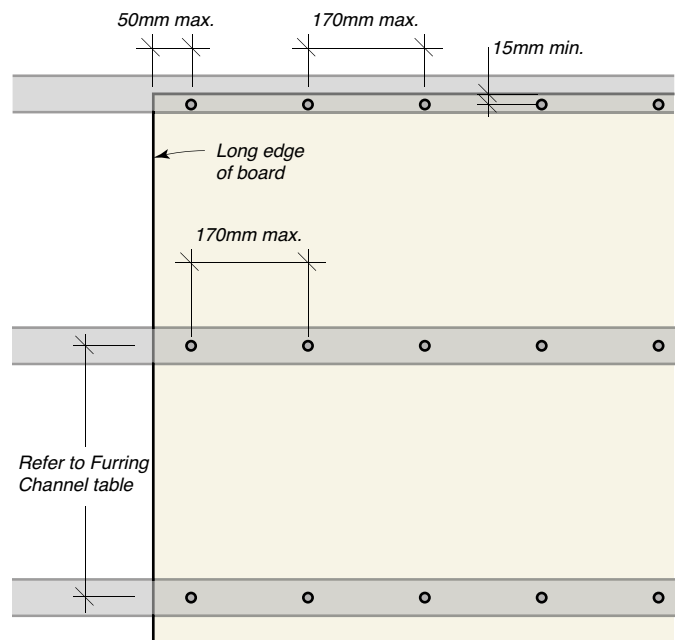


Figure 347: Board Support

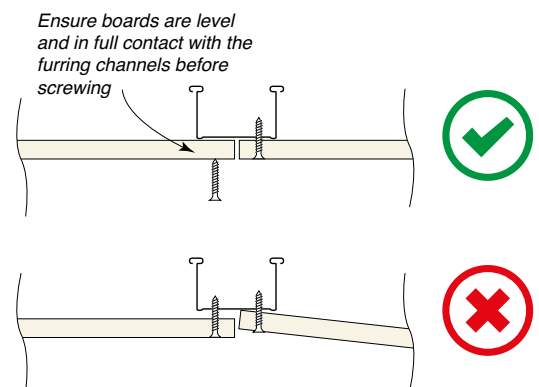
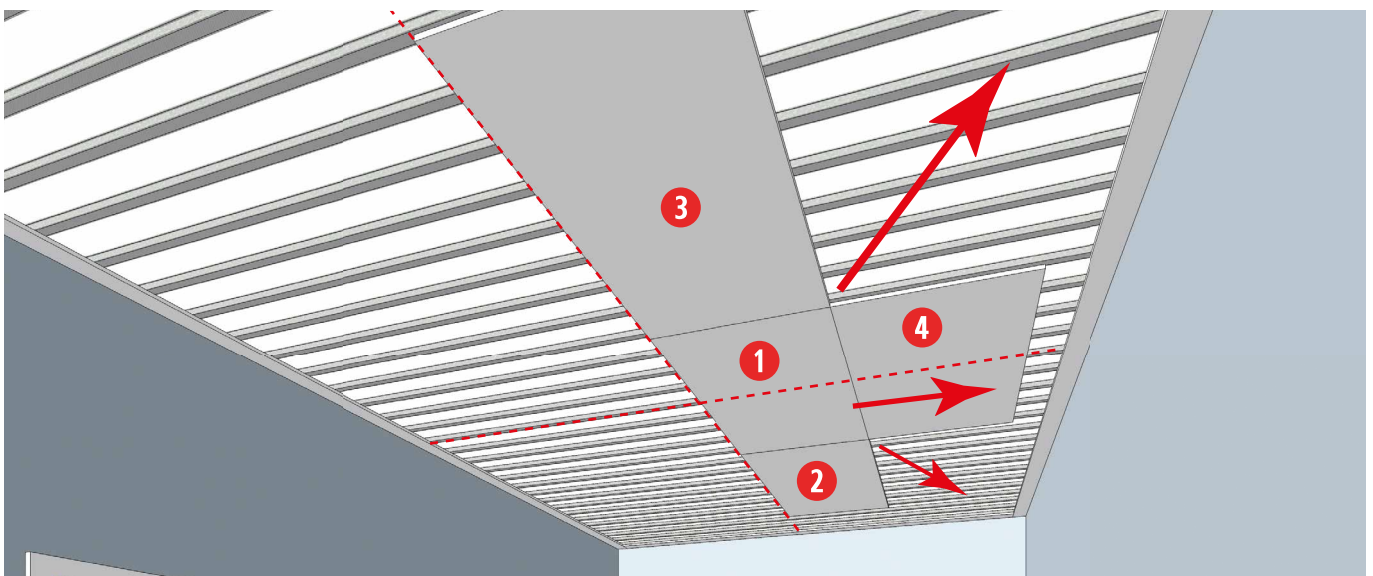


Figure 345: Rigitone Board Installation Order





Once the first board is installed correctly, use the appropriate Pattern Spacing tool to align all boards evenly and to maintain the required joint space. Refer to Figure 348. Continue installation of boards in the order recommended in Figure 345. Refer to Figure 341, Figure 342 and Figure 343 for perimeter finishing options.

Figure 348: Rigitone Pattern Spacer Tool



## Jointing & Finishing

Jointing of boards is completed using specialised Rigitone products:

Figure 349: Rigitone Filler Accessory Kit

A starter accessory kit used for the seamless jointing of Rigitone perforated plasterboard products.



Rigitone Barrel Gun



Two Rigitone nozzle connectors



Two Rigitone nozzles



Rigitone notched joint knife



Rigitone cleaning brush



Rigitone screw head template

Figure 350: Rigitone Filler

Ready-to-use filler for Rigitone joints. Applied using the Rigitone Filler Accessory Kit.



Rigitone Filler – 600ml Sausage

Figure 351: Rigitone Primer

Colourless primer for sealing cut edges of Rigitone plasterboard. Applied using a small brush.



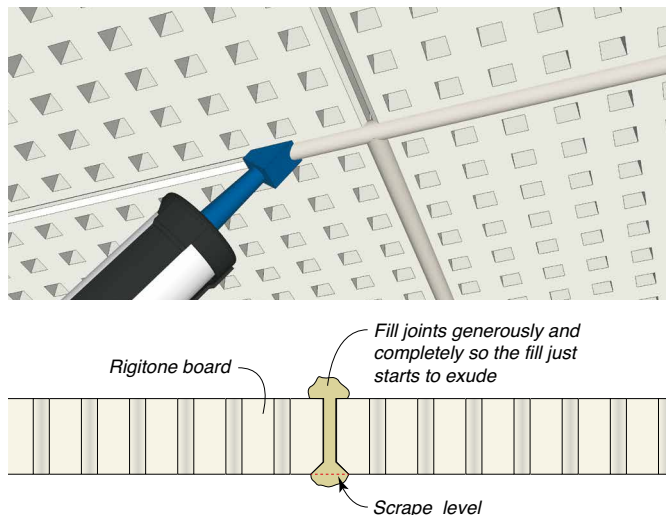
Rigitone Primer – 5 litre container



**Joint Filling**

Fill the joints generously and completely leaving a slightly raised bead at the face of the board and so that the filler starts to exude from the back of the joint.

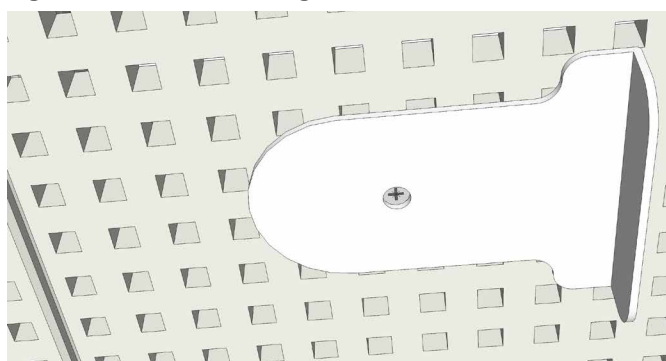
Figure 352: Joint Filling



**Screw Covering**

Using the Rigitone screw head template, cover and slightly overfill the screw heads.

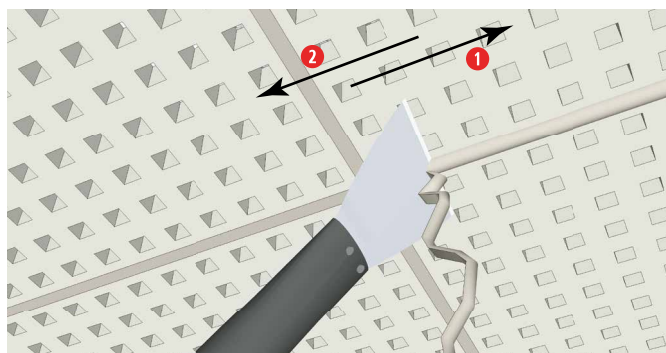
Figure 353: Screw Covering



**Joint Finishing**

After approximately 20-30 minutes, carefully remove the slightly hardened excess joint filler from joints and screw heads using the specialised notched joint knife, moving in one direction then pass back over the joints in the other direction to smooth the surface.

Figure 354: Joint Scraping



After approximately 24 hours, the joints and covered screw heads can be sanded and prepared for painting. Heavy sanding should be avoided as it may result in surface damage.

**Painting**

AS/NZS2311 requires that a sealer plus two coats of water based paint must be applied as a minimum. Such a system will provide a surface with minimal difference in texture and porosity. Finishing of Rigitone boards is to be done with a short haired mohair roller to avoid excessive paint entering the perforations. Spray painting is NOT permitted as paint will impair the acoustic fabric thus degrading the acoustic properties.

**Handling & Storage**

All materials must be kept dry, preferably stored inside. Care should be taken to avoid sagging or damage to ends, edges and surfaces of boards.

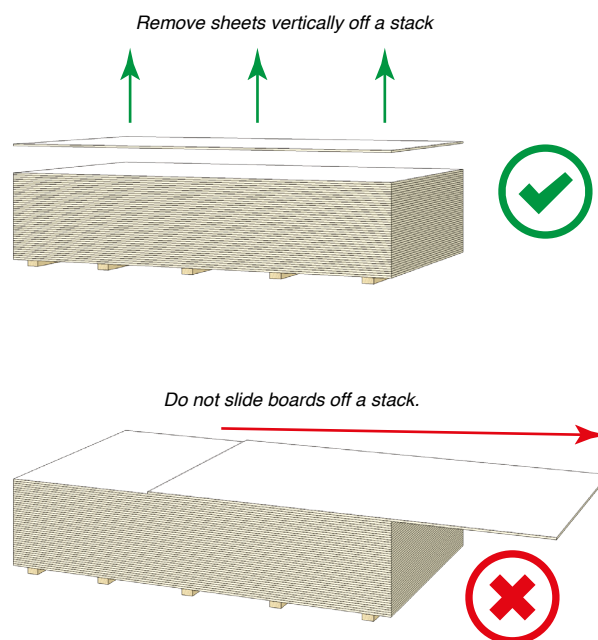
All Rigitone boards must be stacked flat, properly supported on a level platform or on support members which extend the full width of the boards and which are spaced at a maximum of 350mm.

If stored outside, boards must be stored off the ground, stacked as detailed and protected from the weather.

Buildings should be sealed against water ingress before plasterboard is installed. It is recommended that plasterboard damaged by water is replaced.

Boards must be dry prior to fixing, jointing and finishing.

Figure 355: Board Handling



### Access Panel Installation

Rigitone Access Panels are designed to match the perforation patterns of the individual boards with minimal visible interruption of the pattern. Access Panels for Matrix 8mm Round, Matrix 12mm Square and Astral include a perforated panel infill to match the sheet pattern when the cut-out is located between rows of perforations. Rigitone Galaxy Access Panels require a cut-out piece to be attached, sourced from the fixed Galaxy sheet to ensure the pattern continues undisturbed. A minimum plenum depth of 140mm is required to insert the Access Panel from the finished side.

Table 45: Critical Dimensions for 500 x 500mm (nominal) Rigitone Access Panels

Hatch	Cut Opening mm	Formed Opening mm
Rigitone Matrix 8mm Round	518 x 518	501 x 501
Rigitone Matrix 12mm Square	510 x 510	493 x 493
Rigitone Astral	528 x 528	513 x 513
Rigitone Galaxy	515 x 515	500 x 500

### Installation Procedure

Figure 356: Plan Ceiling Layout

The ceiling grid layout must be prepared with respect to the Access Panel location. Furring channels are to be located or terminated between 40 and 100mm from the opening, and additional cross rails may be required.

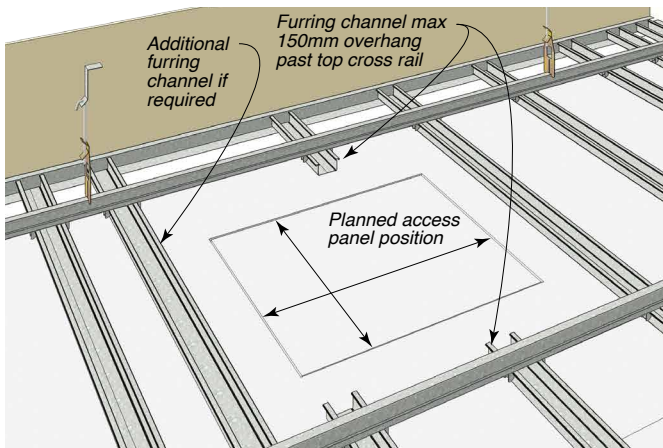


Figure 357: Cut Opening

Using a hand saw, cut the required hole size for the access panel.

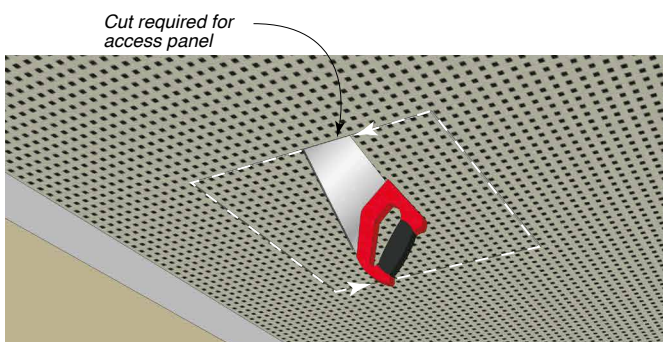


Figure 358: Bevel Panel Edges

Bevel the cut edges of the hole with a sanding block.

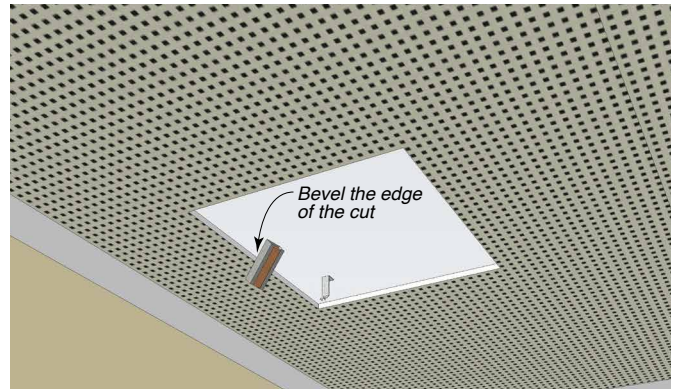


Figure 359: Prime Edges

Prime all cut edges of the opening with Rigitone Primer.

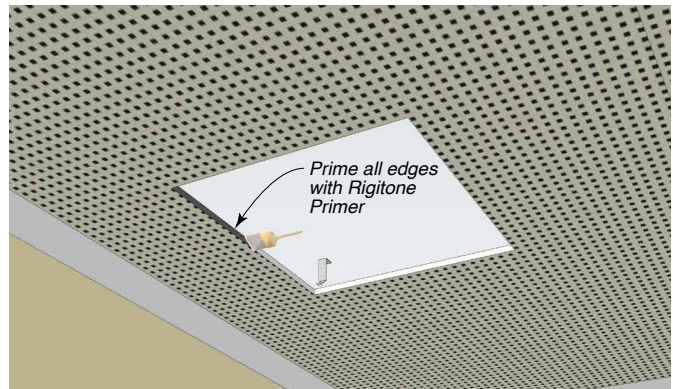
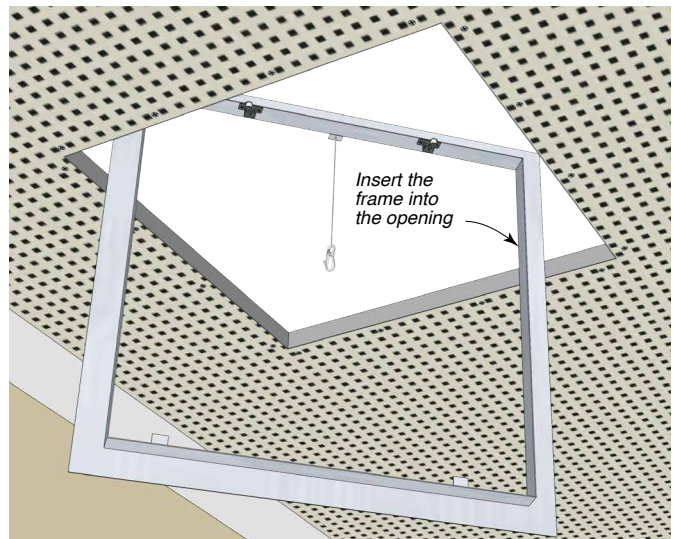


Figure 360: Position Frame

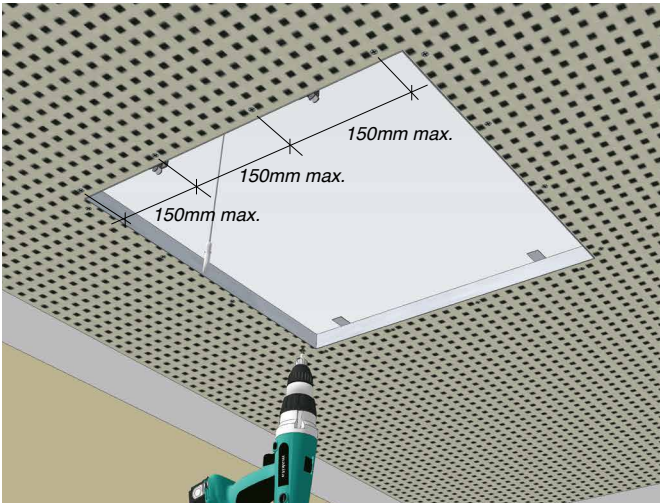
Insert the access panel frame through the opening and position squarely in the cut-out.



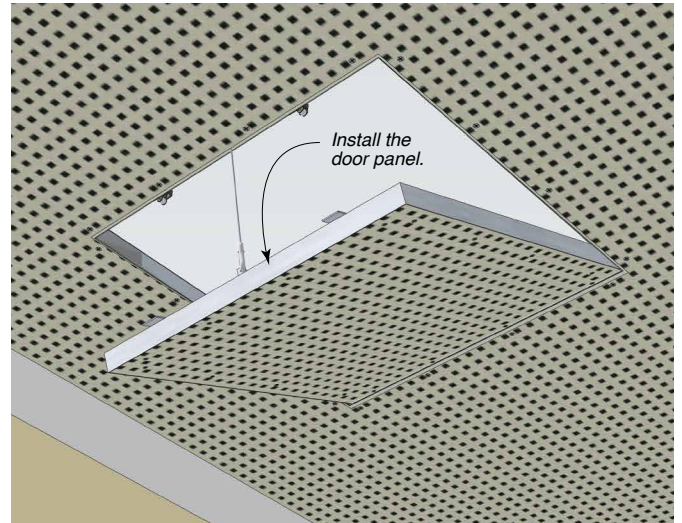


**Figure 361: Install Panel Frame**

Screw fix the access panel frame through the Rigitone panels at 50mm from corners and 150mm max. centres on all sides.

**Figure 363: Rigitone Door Install**

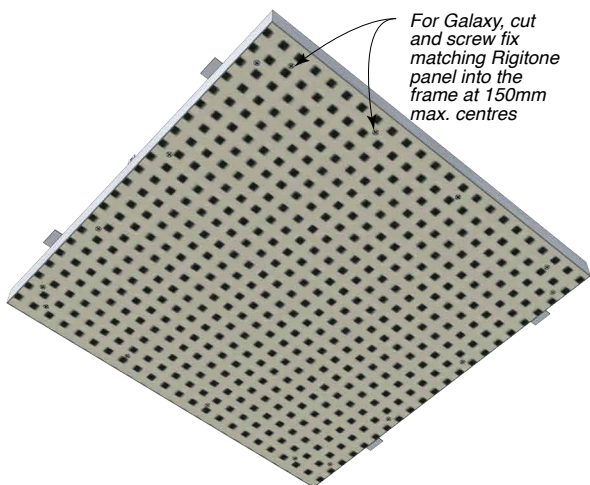
Install the door panel. Engage the hinge tabs, hook the retaining chord to the door frame. Push the door closed and latch closed.

**Figure 362: Panel Door Preparation**

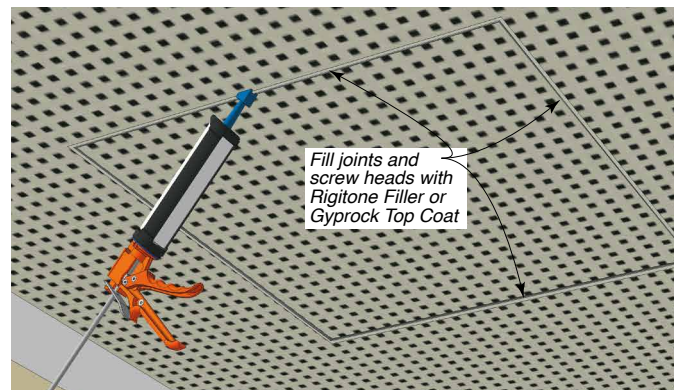
A matching door panel is required to be cut and installed into the door frame.

Gyprock recommends that the door panel be cut from a new sheet of Rigitone plasterboard, helping to achieve a superior finish.

The cut panel should fit snug into the door frame and be screw fixed at 150mm centres. Edges should be filled with Rigitone Filler.

**Figure 364: Joint/Screw Filling**

Fill all gaps between plasterboard and framing and cover screw heads with Rigitone Filler or Gyprock Top Coat. Once dry, scrape back and sand, ready for finishing.



# Gyptone Perforated Ceiling System For Flat Installations

## Design Considerations

- All Gyptone boards are 2400 x 1200 x 12.5mm.
- Plan the ceiling grid and furring channel layout based on Table 46.
- Plan for a decorative border using 13mm Gyprock Standard Plasterboard.
- Maximum point load is 3kg, adequate independent or additional support must be provided for services and lighting systems which exceed this limit.
- Install control joints at 12m maximum centres.

## Steel Furring Channel Direct Fixed To Structural Support

Gyprock Gyptone plasterboard may be fixed directly to steel furring which is held by appropriate direct fixing clips attached to a structural support. Refer to Figure 365 and Figure 366.

Direct fixing clips provide some vertical adjustment to enable accurate levelling of the furring. After levelling, side fix brackets should be permanently fixed in place by two screws.

Furring channels then snap fit into the clips.

The ceiling drop should be limited to 200mm maximum with these attachment systems.

Install brackets to ensure there is a clearance between joist and furring of 10mm minimum.

Refer to Table 46 for grid span and spacing information.

Figure 365: Steel Furring Channel Direct Fixing Methods

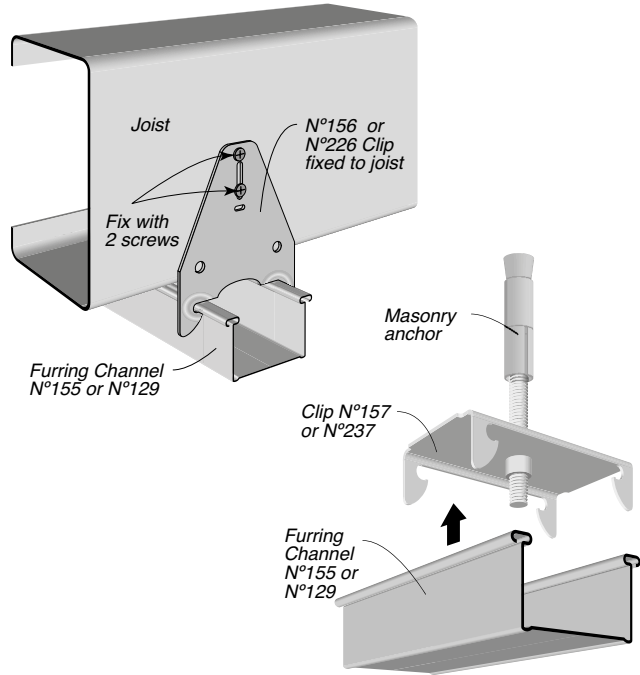
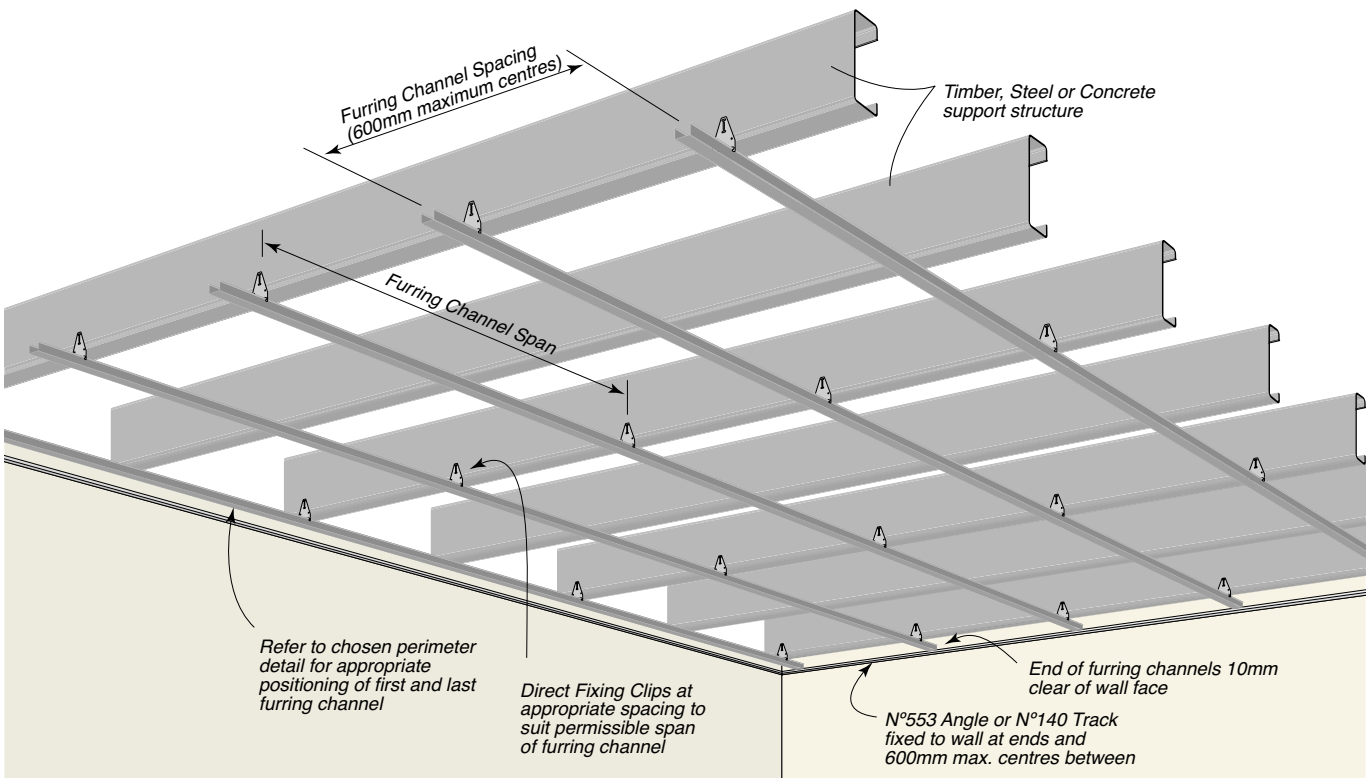


Figure 366: Gyptone Steel Furring Channel Direct Fixed To Framing



### Concealed Grid Ceiling Suspension System

Gyprock perforated boards may be fixed directly to steel furring which is part of a concealed grid suspended ceiling frame as detailed in Figure 368.

These systems are NON-TRAFFICABLE and are not designed to resist the weight of foot traffic. Where access to the ceiling area is required, install a Rondo Walkabout Ceiling System.

Gyprock Suspended Ceiling Systems comprise suspension brackets fixed to the supporting structure, suspension rods, suspension clips, top cross rails, and a locking key for coupling to the furring channel. Refer to Figure 367 and Figure 368.

Rondo N°155 furring channels must be used at all butt joints. Rondo N°129 furring channels are narrower and may be used at other locations.

Where Top Cross Rails are not continuous, they must be joined as shown in the suspended ceiling components details. Joins must be aligned with hanging points.

For design and installation requirements, including for seismic bracing details, refer to details in this guide and Rondo Building Services specifications.

Table 46: Furring Channel Specifications

Furring Channel	N°129	N°155
Spacing max. mm	600	600
Span max. mm	1500	1800

NOTES:

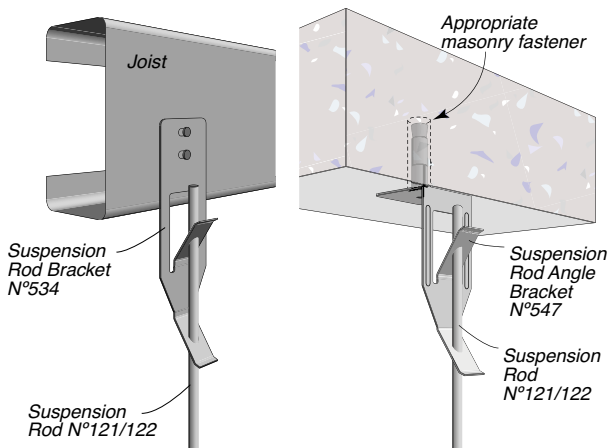
Furring to be continuous over 2 or more spans.

Dead load deflection – Span/360.

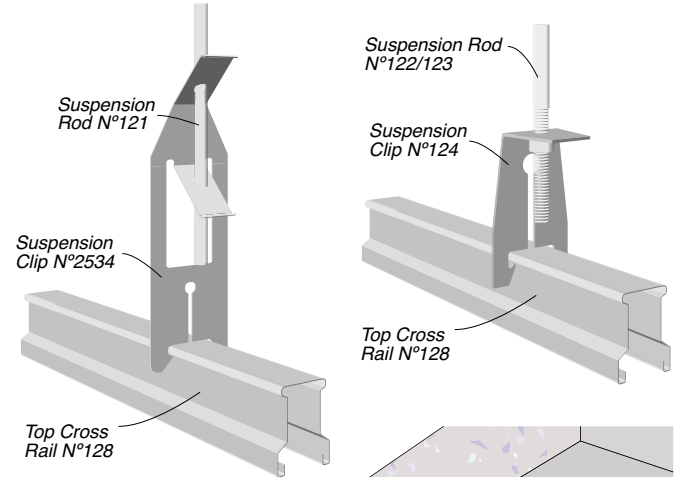
Including internal UDL of 0.375kPa and 3kg/m<sup>2</sup> of insulation and fittings

Figure 367: Key-Lock Concealed Grid Suspended Ceiling Components  
(Refer to Rondo Building Services literature for additional information)

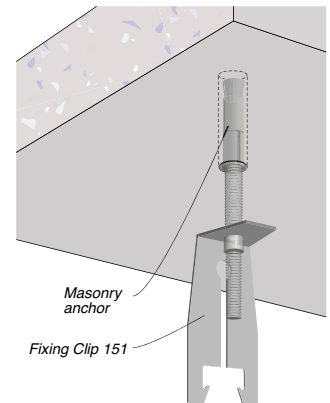
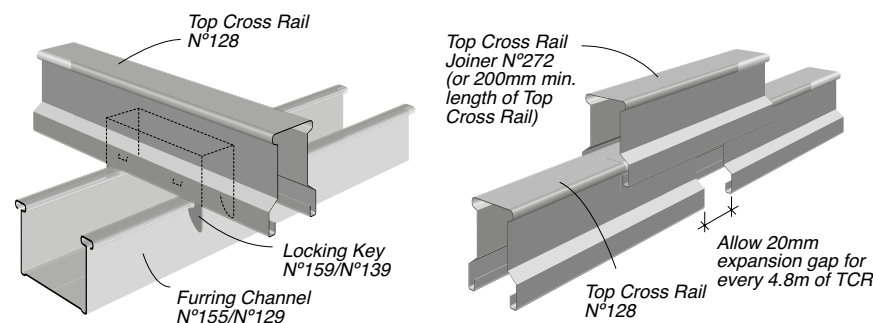
#### Suspension Brackets



#### Suspension Clips



#### Joiners

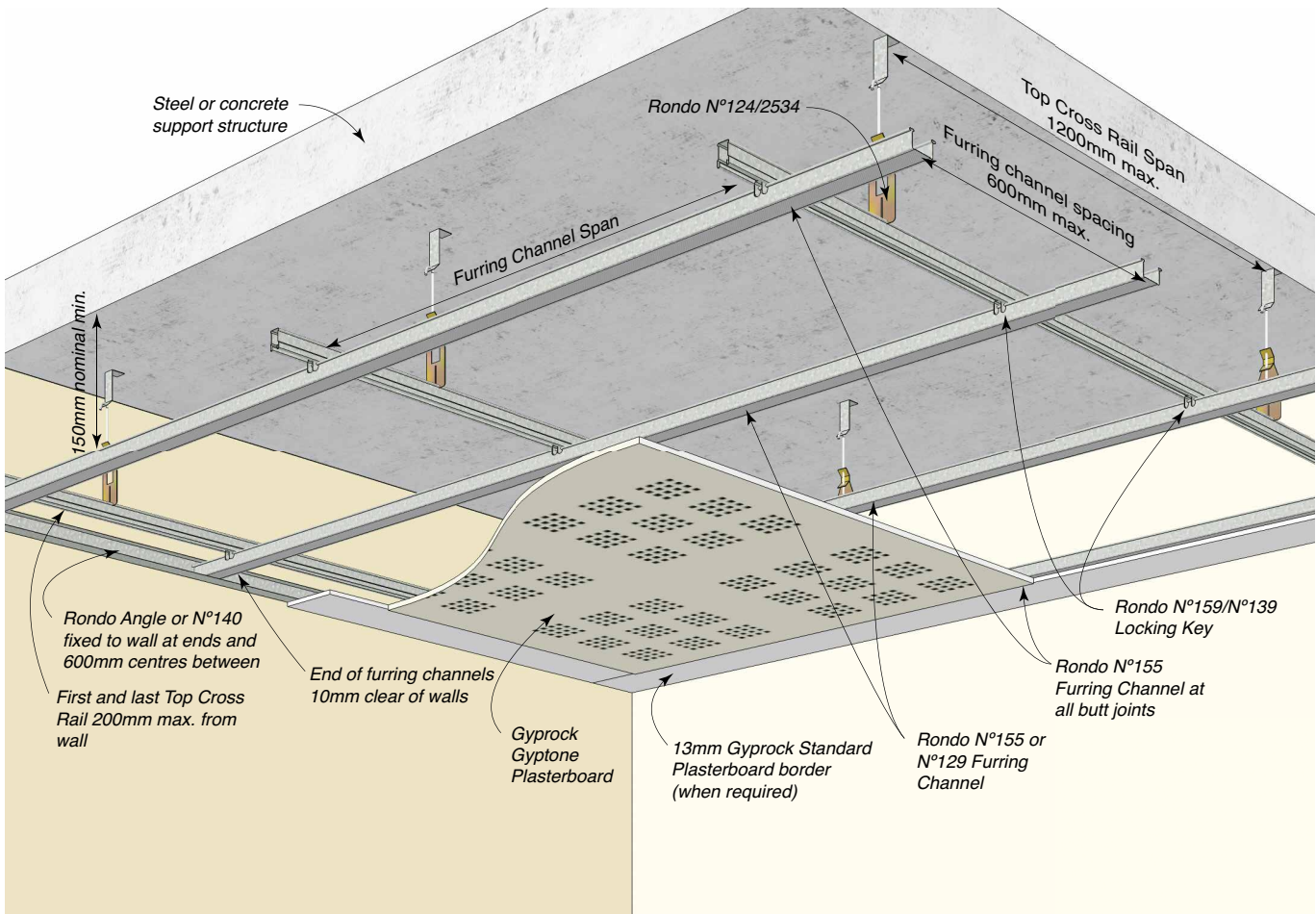




## Installation Overview

1. Gyptone boards must be installed with the long edge of the boards at right angles to the furring channels.
2. Screw fix boards, in accordance with this guide.
3. Boards should be butted hard against each other and aligned appropriately.
4. Allow for a border using 13mm Standard Gyprock Plasterboard (when required).
5. Tape and set all joints with Gyprock Paper Tape and standard 3 coat Gyprock compound system. Cover all screw heads. Sand joints and screw heads.
6. Paint as required.

Figure 368: Gyptone Concealed Grid Suspended Ceiling





## Installation Procedure

### Board Layout & Installation

1. Gyptone boards must be installed with the long edges at right angles to the furring channels and ends of boards must be supported by furring channels.
2. Mount the first board in the centre of the room. Use an alignment line or preferably a fixed edge guide to ensure the board is properly aligned before screw fixing into place. Refer to Figure 369.
3. Boards should be fastened into place using Gyprock 6g x 25mm needle point screws at 15mm min. from board ends and 50mm minimum from the long edges. Screws are to be placed at 200mm max. centres at board ends and 300mm max. centres in the field of the board. Refer to Figure 370.
4. Always fasten the short edges of the board first, then the long edges and body.
5. Ensure boards are level and in full contact with the furring channel before screw fixing. Refer to Figure 371.
6. Work outwards from the centre of the room in a star pattern when mounting subsequent boards, making sure that they are all laid in the same direction.

Figure 369: Gyptone Board Installation Order

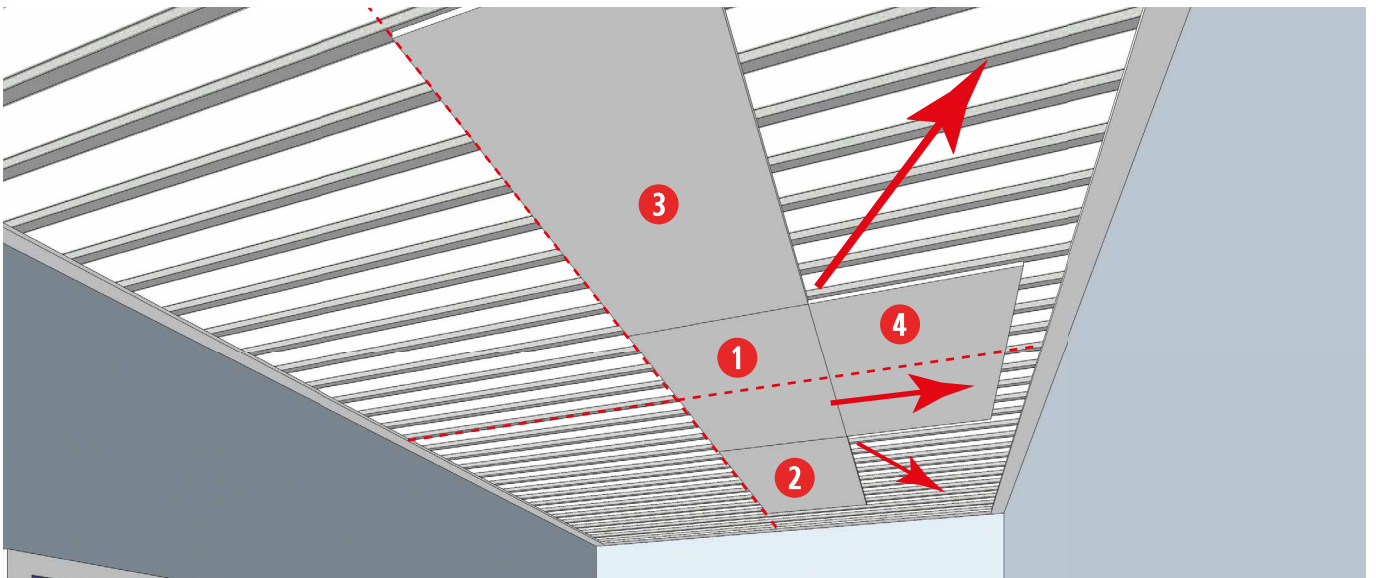


Figure 370: Gyptone Board Fixing Locations

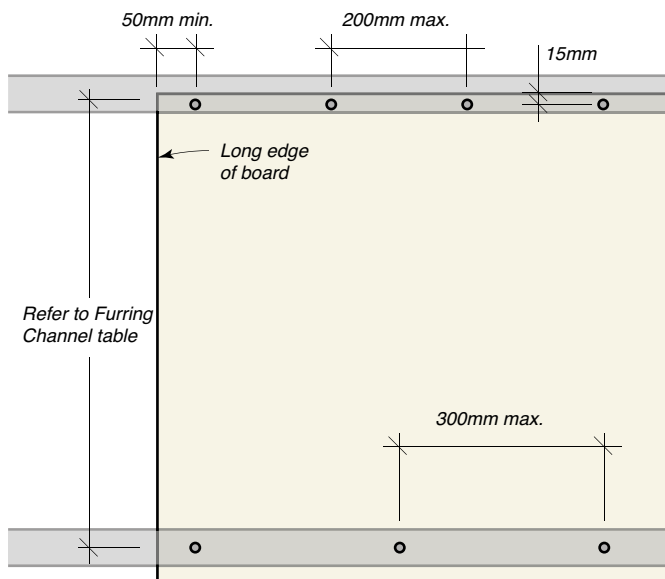
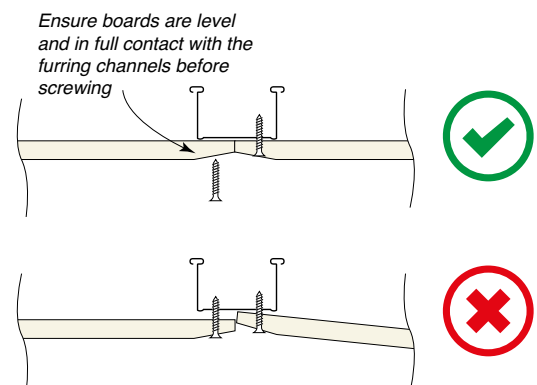


Figure 371: Board Edge Support And Alignment



# Gyptone Perforated Ceiling System For Curved Installations

## Design Consideration

- Gyptone Flexible boards are 2400 x 1200 x 6.5mm and are installed as a single layer only.
- Determine the curved ceiling area.
- Gyptone Flexible must only be curved over the length of the board, and may be concave or convex.
- It is recommended that boards are all laid in the same direction.
- Minimum curving radius – Dry curving  $\geq 2.2\text{m}$  or Wet curving = 1.2m.
- When required, plan for a decorative border using 6.5mm Gyprock Flexible Plasterboard. For perimeter details refer to Figure 380 and Figure 381.
- Plan the ceiling grid and furring channel layout, based on Figure 372, Figure 373 and Figure 374. Ensure furring channels are spaced as per Table 47.
- Maximum point load is 1kg, adequate independent or additional support must be provided for services and lighting systems which exceed this limit.

## Control Joints

Control joints should be installed at 12m maximum centres in both directions. Control joints are also to be provided:

- At all construction joints of the building
- At junctions with other building elements
- At changes of structural support systems
- Other locations as specified.

Table 47: Furring Channel Spacing

Location	Furring Channel Spacing
Within 300mm of Short Edge or Short Edge Joints	150mm
Field	300mm

Table 48: Furring Channel Span

Furring Channel Maximum Span	Top Cross Rail Maximum Span
1200mm	1200mm

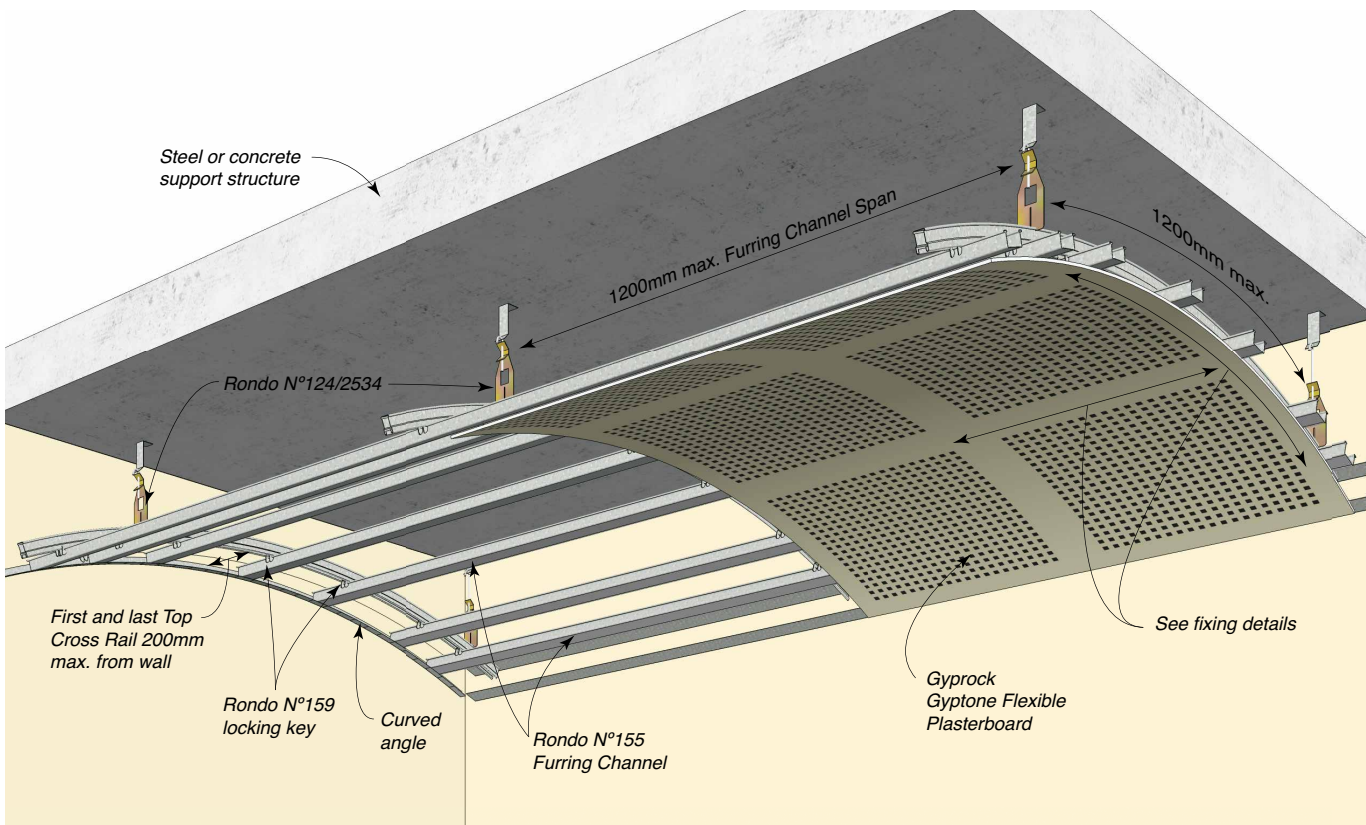
NOTES:

Furring to be continuous over 2 or more spans.

Dead load deflection –  $\text{Span}/360$ .

Including internal UDL of 0.375kPa and 1kg/m<sup>2</sup> of insulation and fittings

Figure 372: Overview Of Concealed Grid Suspended Ceiling With Gyptone Flexible Board



### Concealed Grid Ceiling System

Gyproc Gyptone Flexible perforated boards may be fixed directly to steel furring which is part of a concealed grid suspended ceiling frame as detailed in Figure 372 and Figure 373. Ensure furring channels are spaced as per Table 47 and Table 48.

These systems are NON-TRAFFICABLE and are not designed to resist the weight of foot traffic. Where access to the ceiling area is required, install a Rondo Walkabout Ceiling System.

Gyproc Suspended Ceiling Systems comprise suspension brackets fixed to the supporting structure, suspension rods, suspension clips, top cross rails, and a locking key for coupling to the furring channel. Refer to Figure 367 and Figure 375.

Where Top Cross Rails are not continuous, they must be joined as shown in the suspended ceiling components details. Joins must be aligned with hanging points.

For installation requirements, refer to details in this guide and Rondo Building Services specifications.

Figure 375: Curved Top Cross Rail

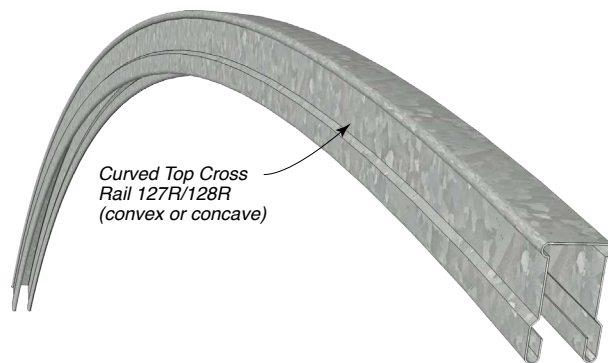


Figure 373: Gyptone Concealed Grid Suspended Flexible Ceiling

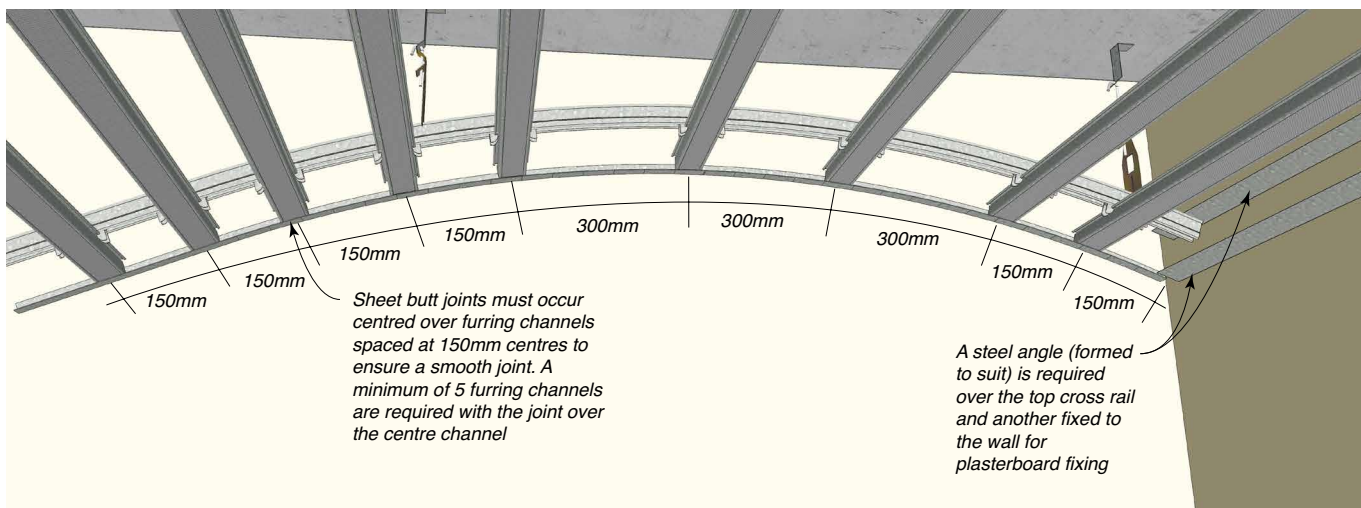
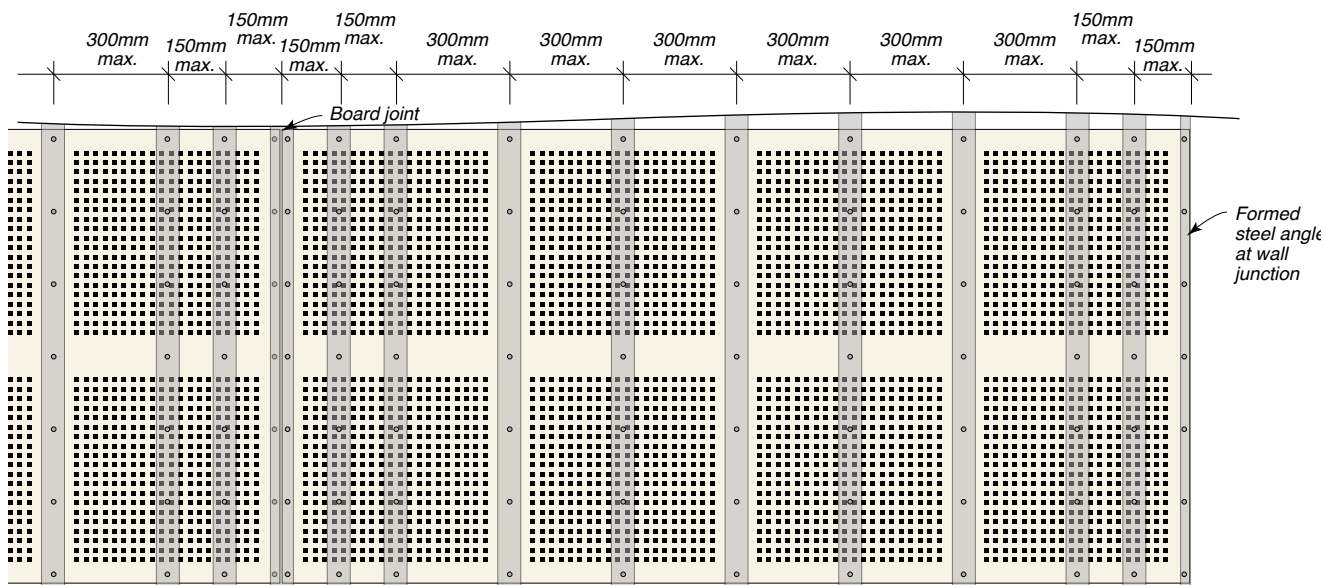


Figure 374: Furring Channel Layout



## Installation Overview

- Only curve boards lengthways.
- Boards must be installed with the long edges at right angles to the furring channels
- All ends of boards must be supported and fixed to furring channels or wall angles.
- Gyptone Flexible boards do not have a recessed short edge. To strengthen this joint, a bevel must be made along these short edges to allow for insertion of additional compound at board joints. Refer to Figure 376.
- Boards should be butted hard against each other and aligned appropriately before fixing.
- Tape and set all joints with Gyprock Paper Tape and standard 3 coat Gyprock compound system. Cover all screw heads. Sand joints and screw heads.
- Paint as required.

## Installation Procedure – Dry Board Curving

### Preparation

1. Direct installation of dry Gyprock Gyptone Flexible plasterboard is suitable for a curving radius of 2.2m minimum.
2. Ensure short edges at board joints have been bevelled. Refer to Figure 376.

### Board Installation

1. Mount the first board and ensure the board is properly aligned and supported before screw fixing. Refer to Figure 377.
2. Boards should be fastened into place using Gyprock 6g x 25mm needle point screws at 15mm min. from board edges and 50mm minimum from corners. Screws are to be placed at 100mm max. centres at board ends and 200mm max. centres in the field of the board. Refer to Figure 378 and additional information in this guide.
3. Always fasten one short edge of the board first. Slowly curve the board ensuring the board is in full contact with the furring channels before screw fixing.
4. Tape and set all joints with Gyprock Paper Tape and standard 3 coat Gyprock compound system. Cover all screw heads. Sand joints and screw heads.
5. Paint as required.

Figure 376: Beveling Of Board Edge

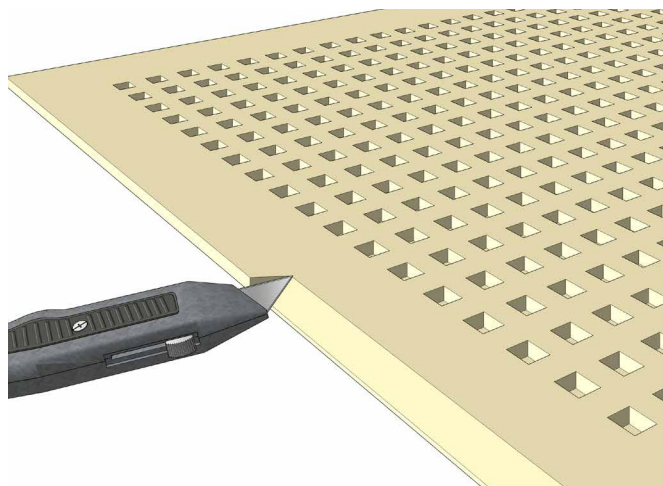


Figure 377: Board Edge Support And Alignment

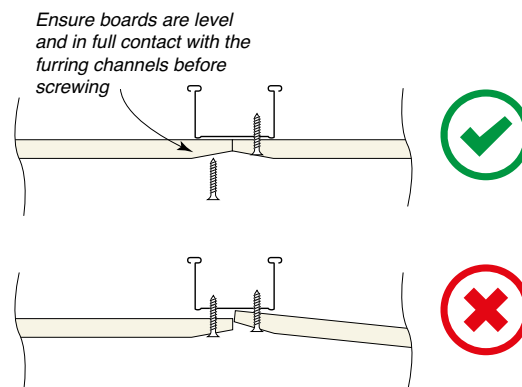
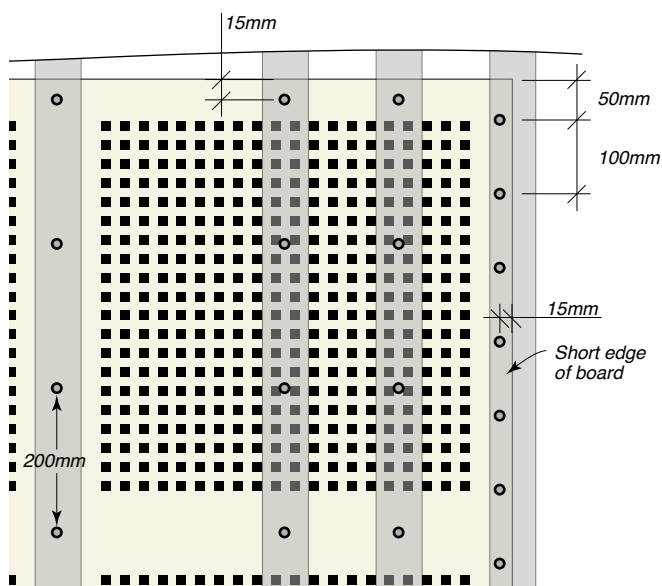


Figure 378: Screw Fixing





## Installation Procedure – Wet Board Curving

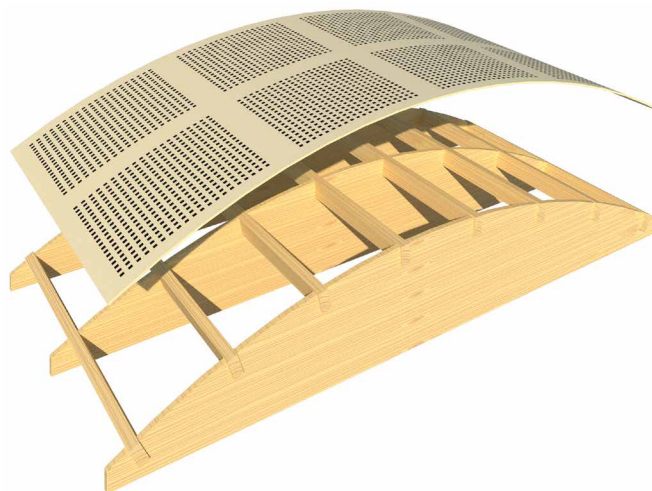
### Preparation

1. A wet curving procedure is required for a bending radius from 2.2m to 1.2m allowing Gyptone Perforated Flexible board to be pre-curved prior to installation.
2. Ensure short edges at board joints have been bevelled. Refer to Figure 376.
3. To achieve desired curvature, build a template to curve the Gyptone Flexible board. Refer to Figure 379.
4. Use clean water. Water must be applied on the concave side of the plasterboard (i.e. closest to the centre of the radius).
5. Place plasterboard on an even surface. Apply a small amount of water across the plasterboard with a sponge. Ensure to avoid applying water into the perforations. If needed, apply more water after 2-5 minutes (continue applying for approximately 15-20 minutes).
6. Carefully lift the panel onto the top of the template. Apply pressure on the edges with a flat, wooden plank or steel stud. Fix with a clamp until plasterboard is 100% dry.
7. Carefully lift up the panel when it is 100% dry and install no more than 2 hours after it is removed from the form. Otherwise it will assume its original shape.

### Board Installation

1. Mount the first board at the corner of the ceiling area. Ensure the board is properly aligned and supported before screw fixing.
2. Boards should be fastened into place using Gyprock 6g x 25mm needle point screws at 15mm min. from board edges and 50mm minimum from corners. Screws are to be placed at 100mm max. centres at board ends and 200mm max. centres in the field of the board. Refer to Figure 378 and additional information in this guide.
3. Always fasten one short edge of the board first. Slowly curve the board ensuring the board is in full contact with the furring channels before screw fixing.
4. Tape and set all joints with Gyprock Paper Tape and standard 3 coat Gyprock compound system. Cover all screw heads. Sand joints and screw heads.
5. Paint as required.

Figure 379: Curving Flexible Board Over Template



### Perimeter Details

Gyprock Gyptone Flexible ceilings can be finished flush with the wall or with a decorative border of Gyprock Flexible plasterboard. An angle is used to secure the ceiling to the wall on both the curved and straight edges.

Figure 380: Perimeter Detail

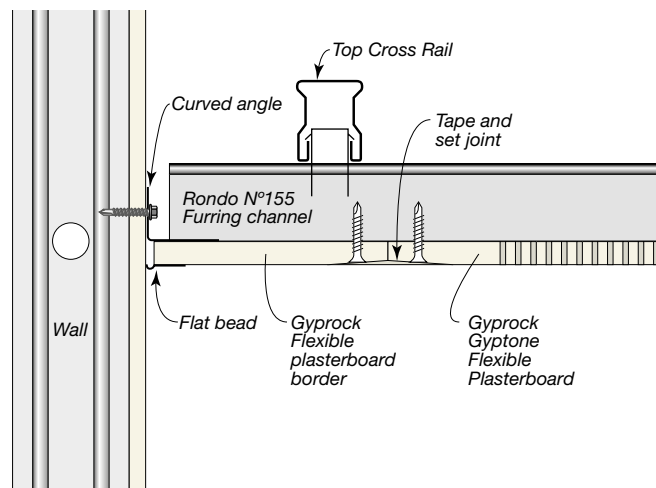
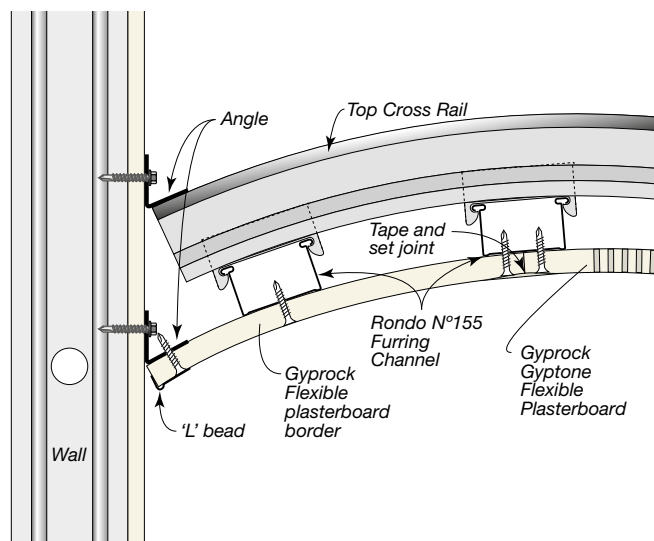


Figure 381: Perimeter Detail



### Jointing Of Recessed Joints

All Gyptone edges are recessed for flush joint finishing. Except short edges of Gyptone Perforated Flexible plasterboard which must be bevelled.

CSR Gyprock recommends the use of curved trowels when setting recessed joints. Under normal pressure, a curved trowel deflects enabling the preparation of flatter and more consistent joints.

#### Tape Coat

- Fill recess in plasterboard evenly and fully with compound using a broadknife.
- Bed in Gyprock Paper Tape centrally over the joint and cover lightly with compound.
- Cover all fastener heads and fill any surface damage with compound. Compounds must not interfere with perforations.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

#### Second Coat

- Apply a second coat, slightly wider and finishing slightly above the board surface, and feather joint edges.
- Cover fastener heads with a second coat of compound, laid in a different direction. Compounds must not interfere with perforations.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

#### Finish Coat

- Apply a thin finish coat of topping compound centrally over the previous coat, slightly wider than previous coat, insuring that the compounds never interfere with any perforations in the board. Feather the edges of the compound with the trowel.

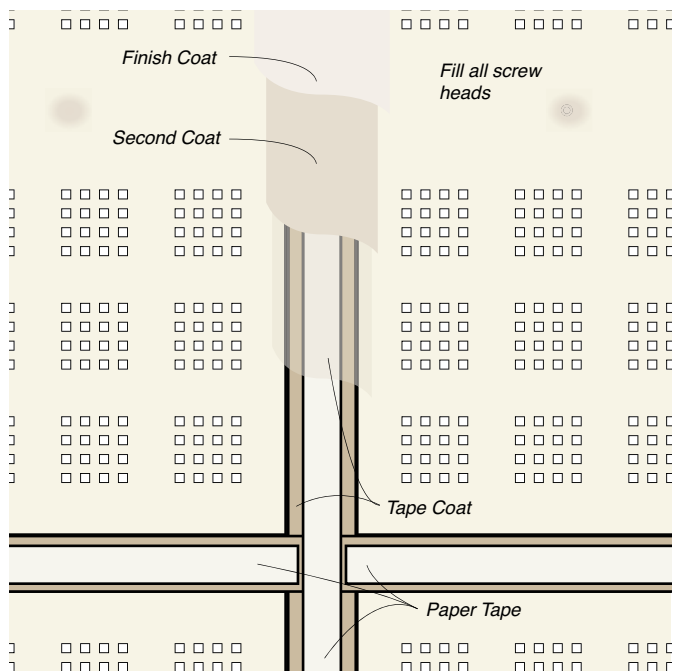
- Cover previously stopped fastener heads with a third coat of compound, laid in a different direction, extending beyond the previous coat. Ensure that the edges of the compound are neatly feathered and that there are no trowel edge marks left in the final stopping. Ensure that the compounds never interfere with any perforations in the board.
- Allow the finish coat of compound to dry for at least 24 hours before proceeding.

#### Sanding

- Sand smooth with 180 grit paper or cloth, or with 220 grit sanding mesh. Avoid any heavy pressure which might scuff the linerboard.

**Caution:** If previous coats of drying type compounds are not thoroughly dry before application of subsequent coats, imperfections can result from delayed shrinkage of the compound.

Figure 382: Board Jointing



#### Painting

AS/NZS2311 requires that a sealer plus two coats of water based paint must be applied as a minimum. Such a system will provide a surface with minimal difference in texture and porosity

Finishing of Gyptone boards is to be done with a short nap roller to avoid excessive paint entering the perforations. Spray painting is NOT permitted as paint will impair the acoustic tissue thus degrading the acoustic properties.



## Gyptone Access Panel Installation

Gyprock Gyptone Access Panels allow for quick and easy access to above ceiling services and are fully integrated in the ceiling finish. The range and aperture size makes them more practical for the user, with an opening of 510mm x 510mm. Remember to leave a minimum of 35mm between the ceiling section and the underside of any services, to allow for removal of the hatch.

Additionally, Gyprock Gyptone Access Panels are a gypsum-only construction with no metal parts, providing a much improved aesthetic finish, allowing full integration with the corresponding Gyptone board.

Three options are available to match the Gyptone plasterboard sheets.

**Gyprock Gyptone  
12mm Square  
Access Panel**



**Gyprock Gyptone  
12mm Square  
Minigrid  
Access Panel**



**Gyprock Gyptone  
Slotted Minigrid  
Access Panel**



### Benefits

- Patterns match Gyptone boards
- Quick and easy to install
- Very neat factory cut edges – no site cutting of hatch
- Access aperture now 510mm x 510mm
- Jointless frame – seamless finish
- Frame and hatch weight: approximately 4.5kg

### Installation Overview

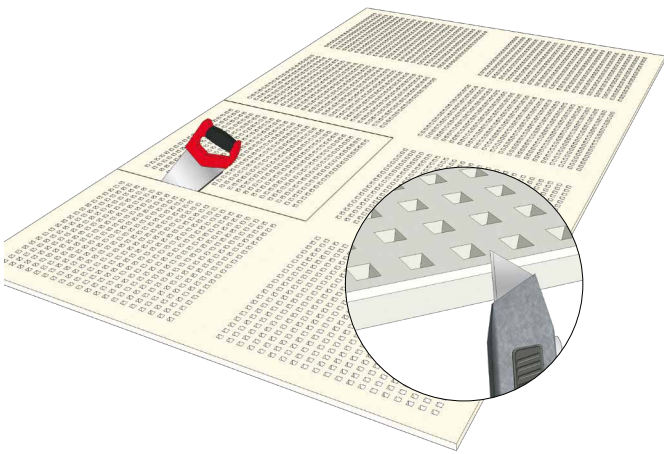
1. Select the correct hatch pattern for the chosen Gyptone sheets.
2. Cut the Gyptone board to the correct size of the panel frame, ensure the location matches the Gyptone pattern.
3. Hatch must be installed so that the hatch frame can be screwed into the ceiling furring channels.
4. Install 2 additional furring channels at right angles to the existing channels, stop them 10mm short of the main channels.
5. Joint the hatch frame using the same method as used when jointing Gyptone without the use of Gyprock Paper Tape.
6. Finish as required.



### Installation Procedure

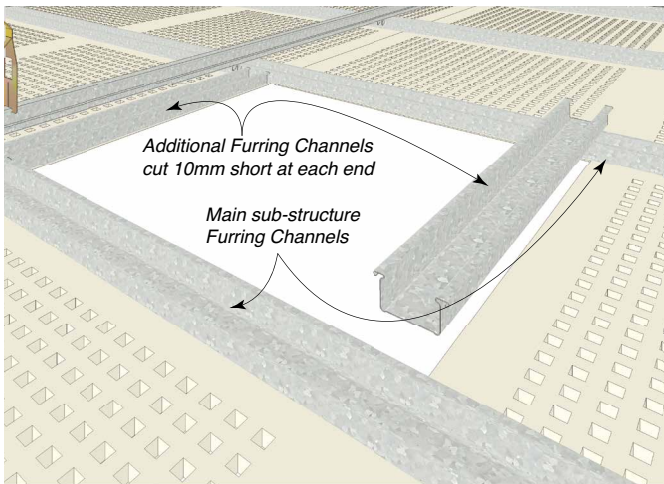
1. Remove the Access Panel from its packaging and store the hatch component in a safe area. Using the frame component, position the Access Panel on the Gyptone sheet by centring it over a perforated section. Trace around the outside of the frame, creating the cut line.
2. Cut the outlined 605mm x 605mm section from the Gyptone sheet, using a hand saw. Once the section is cut away, use a retractable blade knife to bevel all edges of the cut, ready to be filled during the later stages of installation.

Figure 383: Cutting The Opening



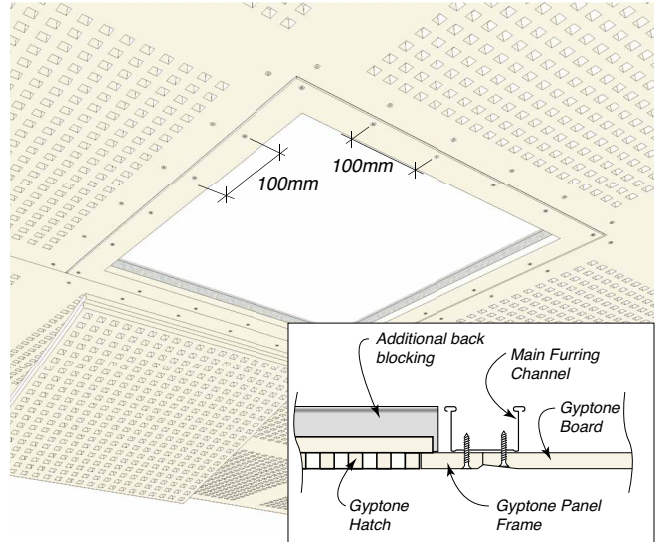
3. Install the Gyptone sheet onto the ceiling frame. Additional back blocking must be installed on the two unsupported hatch edges; use an offcut of furring channel cut 10mm short of the main channels. Screw fix panel to framing at 100mm centres.

Figure 384: Back Blocking



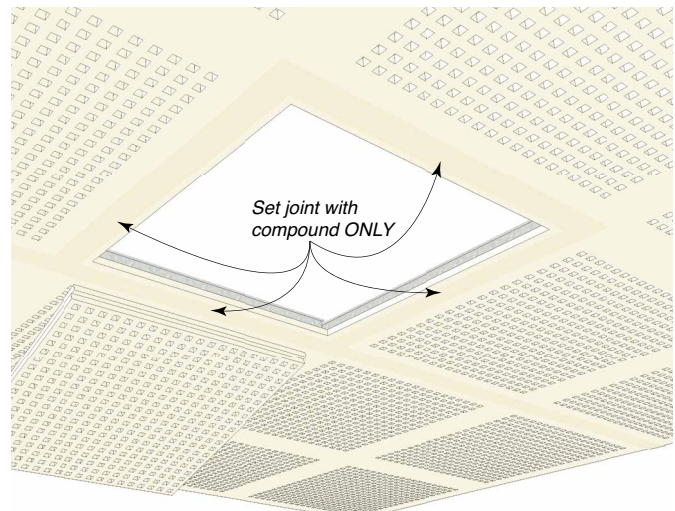
4. Screw fix the Access Panel frame to the furring channels on all four sides, ensure screw placement is at 100mm centres. This must be completed on all four edges to ensure all joints are stable and to avoid reflective cracking.

Figure 385: Frame Installation



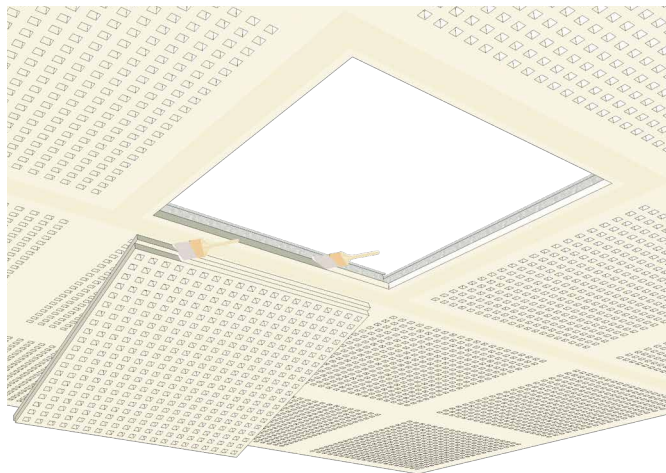
5. Set the joint between the board and the Access Panel frame using the Gyprock three coat jointing system, sanding smooth between coats, and omitting the application of Paper Tape (this is not required).

Figure 386: Frame Jointing



6. All edges of both the frame and the hatch should be painted twice to reinforce them before the hatch is placed in position. A high vinyl content water based coating is recommended, which should be allowed to thoroughly dry to avoid sticking. All edges should be painted at the same time as the face of the ceiling panel to ensure crisp edges.

Figure 387: Frame And Hatch Finishing



Note: When removing the hatch, ensure it is placed with the reverse side in contact with the wall or supporting surface. Avoid contact with the finished face.

## Handling & Storage

All materials must be kept dry, preferably stored inside. Care should be taken to avoid sagging or damage to ends, edges and surfaces of boards.

All Gyptone boards must be stacked flat, properly supported on a level platform or on support members which extend the full width of the boards and which are spaced at a maximum of 600mm.

If stored outside, boards must be stored off the ground, stacked as detailed and protected from the weather.

Buildings should be sealed against water ingress before plasterboard is installed. It is recommended that plasterboard damaged by water is replaced.

Boards must be dry prior to fixing, jointing and finishing.

Figure 388: Board Handling

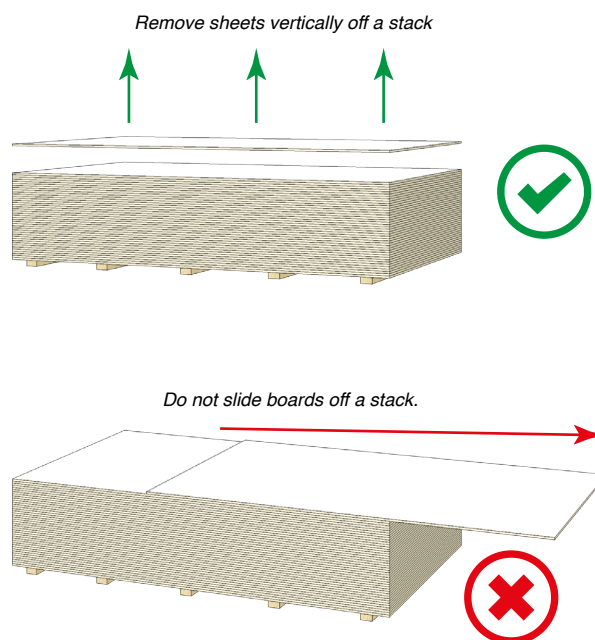
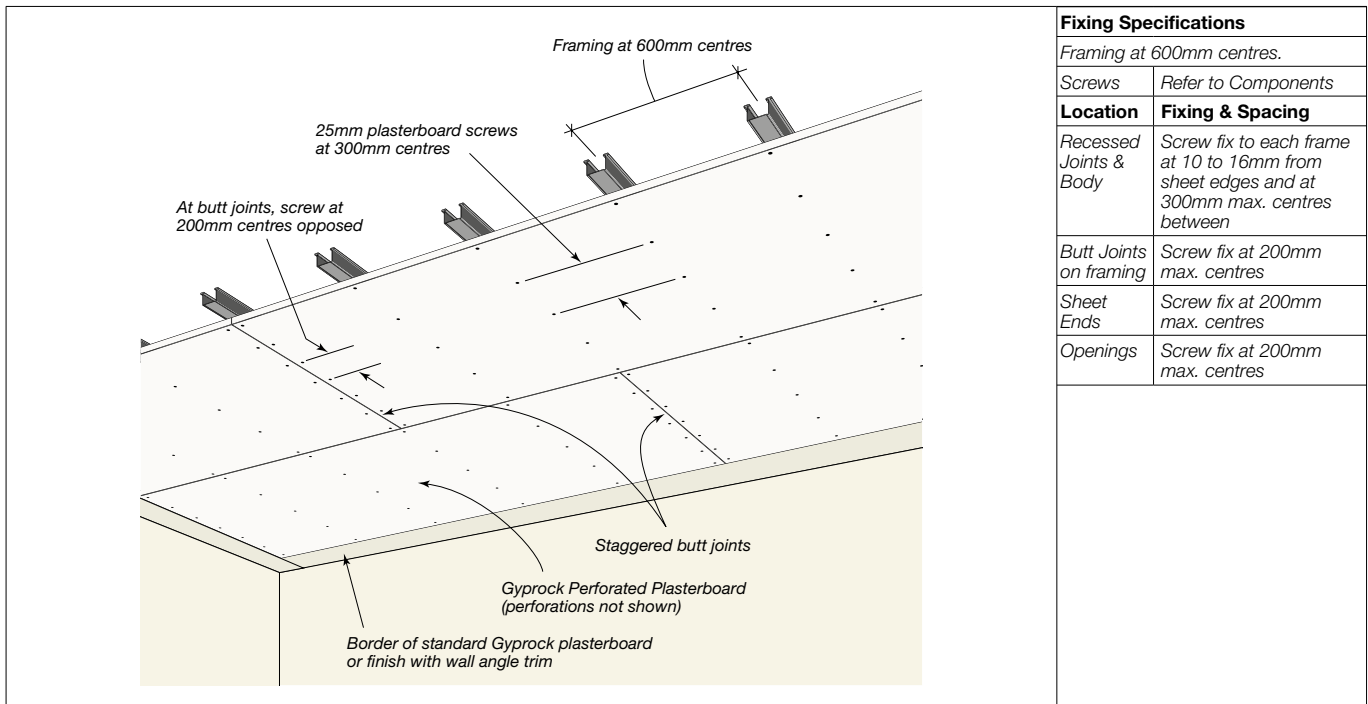




Figure 389: Plasterboard Fixing – Single Layer Gyprock Standard Perforated Plasterboard – Screw Fixing



**Notes On Fixing**

- Plan the layout of the sheets prior to application. It is recommended that a border of standard Gyprock plasterboard at least 150mm wide be provided around the perimeter of the ceiling. Suitable framing must be provided.
- To align perforations, use a stringline or laser.
- Framing members must be positioned at 600mm centres and coincide with non-perforated areas of sheets.
- May be used in curved applications with 20m minimum radius.

**Joints**

Tape and set joints using only approved Gyprock jointing systems and use as detailed later in this guide.

Due to the location of the perforations close to the edge of panels, butt joints are of a narrower width than is normal. Special care should be taken to ensure a good joint finish without filling of perforations.

**Fixing Procedure – Sheets**

Refer to Components for fastener details.

- Apply Gyprock Perforated Plasterboard sheets with paper bound edges at right angles to framing members. Align pattern to previously installed sheets and screw fix as per the fixing table.
- If butt joints are required, centre joints on framing members and screw fix as per the fixing table. Butt joints should be staggered in adjacent sheets.
- Back-blocking is not required.

# Gyprock Tile Ceiling Systems

## Introduction

Gyprock Tile Ceiling Systems offer lightweight, decorative and/or acoustic solutions for commercial applications. They are installed with a two-way suspended grid or direct fixed to battens or an existing plasterboard ceiling.

The pre-coated face of the supporting grid or edge profile of the tiles combine with various surface textures to form a decorative feature ceiling.

## Applications

Gyprock Tile Ceiling Systems are an attractive, economical and functional solution for commercial and industrial ceilings in offices, shops and shopping centres, hospitals and nursing homes, school and university buildings, clubs, restaurants, function centres and community buildings, warehouse and factory buildings.

There is a range of Gyprock Tile Ceiling Systems to suit both decorative and acoustic requirements.

Gyprock Tile Ceiling Systems are NOT suitable for fire rated applications.

## Advantages

- Fast, easy and inexpensive to install. Panels simply sit in a two-way grid suspended frame.
- Panels in grid systems provide ready access to services located above.
- Dimensionally stable panels that will not buckle, shrink or warp. Under normal usage, deflection is minimal – well within the stringent tolerances set by AS2785.
- Virtually maintenance free.
- Vinyl laminate finished panels simply wipe clean with a damp cloth.
- Systems easily adapt to accept flush mounted lighting systems.
- Panels can be easily cut on-site using a trimming knife or panel saw to fit around columns, sprinklers and to accommodate flush lighting systems, etc.
- Used in conjunction with exposed grid suspension systems.
- Hold down clips are available for areas of fluctuating air pressure.

# Components

## Ceiling Tiles

Himmel Interior Systems (a division of CSR) offers a complete range of commercial ceiling tiles, grid and accessories for all building types. The range includes products from Gyprock, Fricker, OWA and Ecophon. Specialty systems in metal and timber are also available, as well as school, healthcare, retail and office specific products.

For more information on ceiling systems or for more stringent ceiling requirements, please contact the Himmel team on 1300 374 253 or visit [www.himmel.com.au](http://www.himmel.com.au).

## Gyprock Ceiling Tiles

CSR Gyprock offers a range of plasterboard ceiling tiles for exposed grid ceiling systems, each with various surface finishes and different properties to suit a variety of commercial applications. Please refer to Table 3 on page 8 for more detailed information.



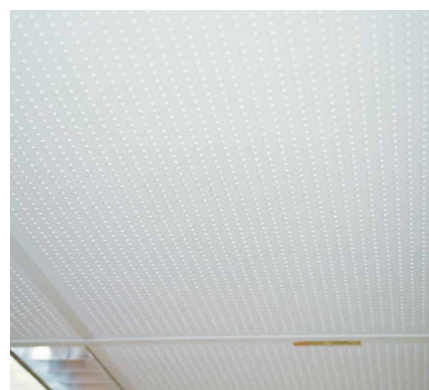
### Gyprock Supatone

Supatone has a wipe clean smooth polycoated white paper laminate surface. Supatone is popular for basic commercial ceiling applications.



### Gyprock Freshtone Diamond White

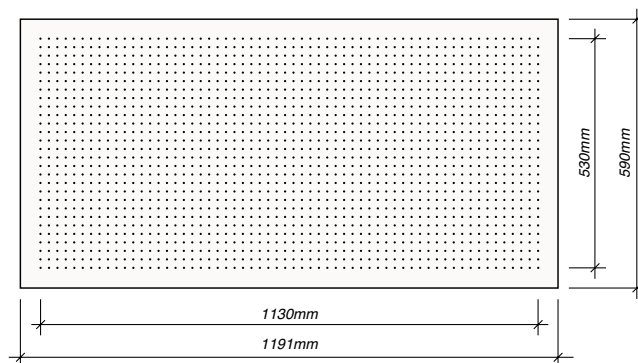
Freshtone has a finely textured white vinyl laminate which resists fading and is easily wiped clean. Freshtone is ideal for shopping centres, offices and industrial premises.



### Gyprock Perforated Tiles

Specifically developed for use in ceilings where additional sound absorption is required. Perforations are approximately 10% of the tile area, and combined with suitable insulation, provide a medium level of acoustic absorption.

**Figure 390: Gyprock Perforated Ceiling Tile**  
(All Dimension Nominal)





## OWA Ceiling Tiles

OWA ceiling tiles are made of bio-soluble mineral fibre and offer a wide range of patterned, textured & scrim face patterns with market leading acoustic standards to meet the needs of commercial applications such as offices, schools, retail and healthcare applications.

For more detailed information contact the Himmel team on 1300 374 253 or visit [www.himmel.com.au](http://www.himmel.com.au).

Figure 391: Typical Ceiling Tile Edge Profiles

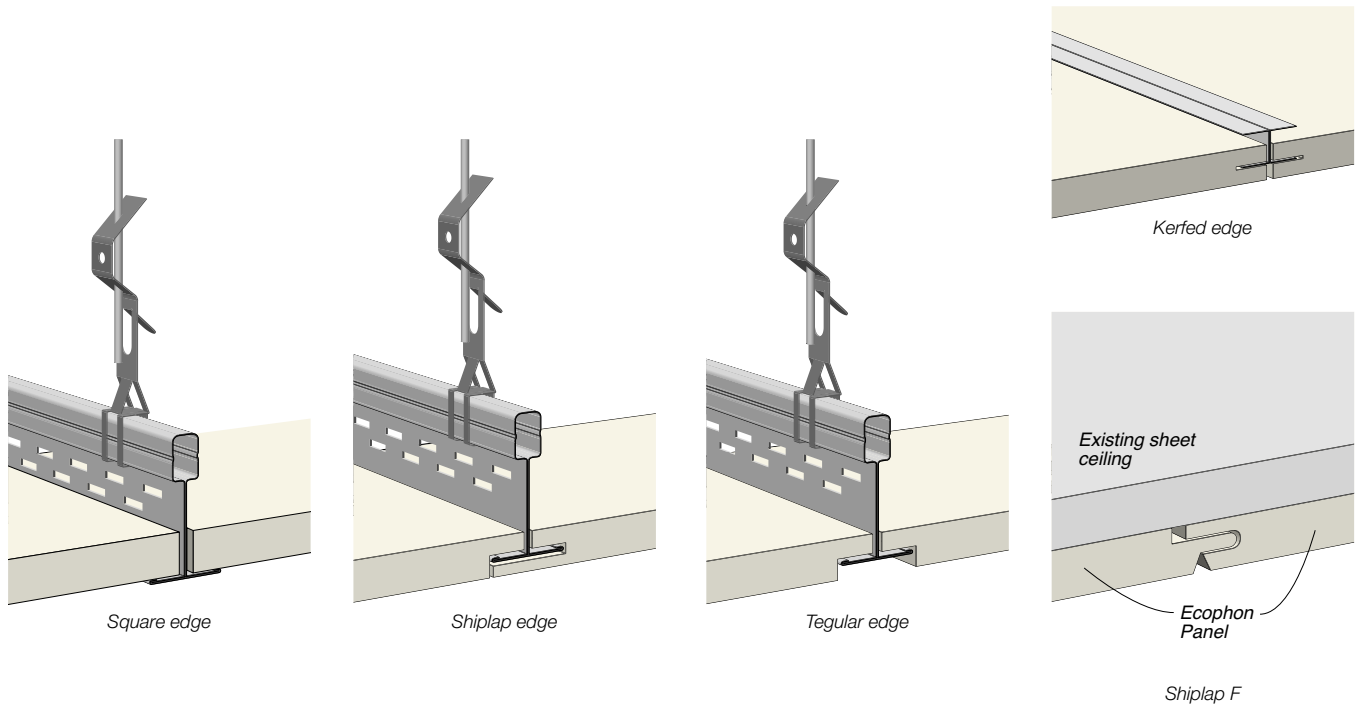


Figure 392: Typical Installation Detail – Himmel Steel Grid Suspended Ceiling System

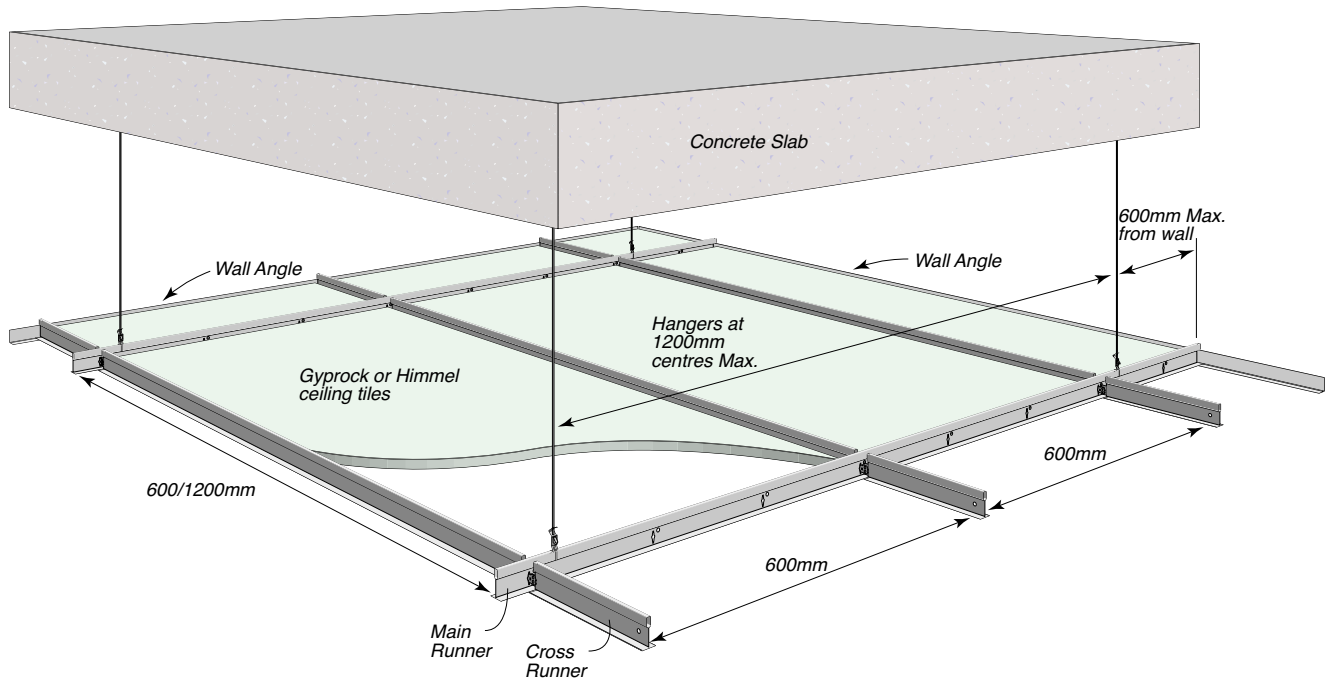


Figure 393: Typical Installation Detail – Fricker Easy Access System With Acoustic Tiles

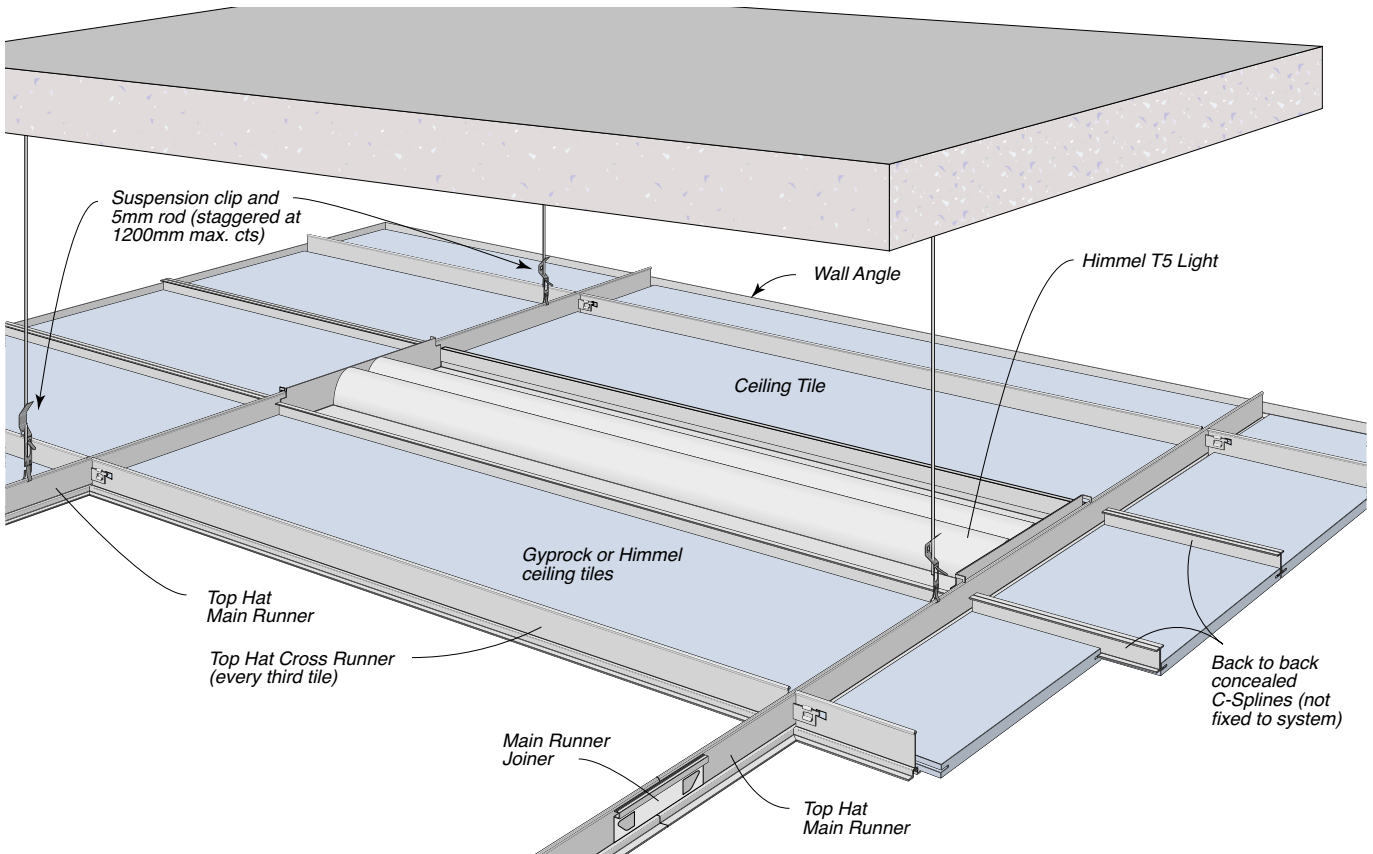
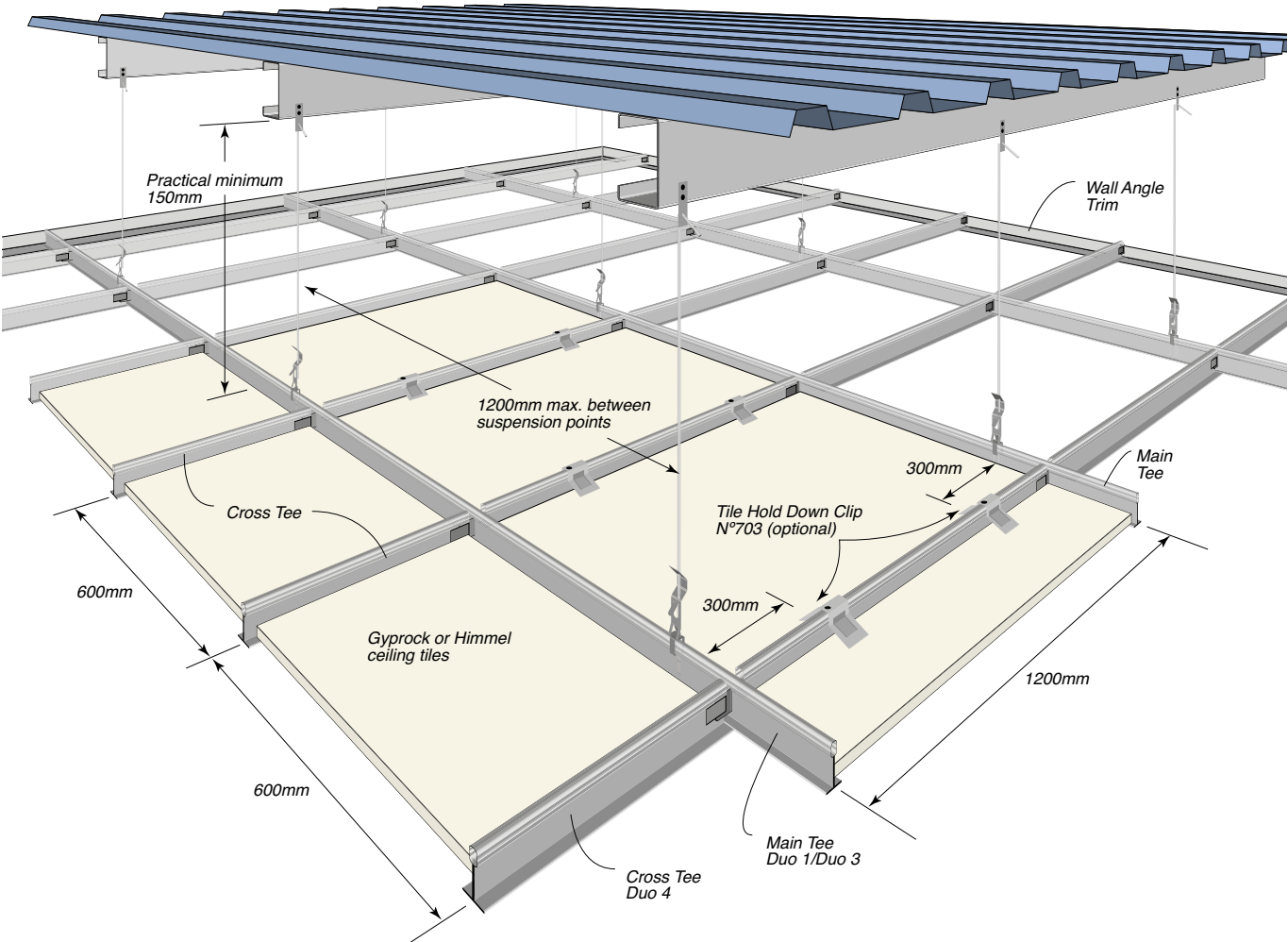


Figure 394: Typical Installation Detail – Rondo Duo Exposed Grid Suspended Ceiling System



# Design Considerations

## Suspension Systems

Gyproc Suspended Ceilings incorporate an Exposed Grid Ceiling System (Himmel Steel Grid, Fricker Easy Access or Rondo Duo), and are designed to AS/NZS2785 Suspended Ceilings – design and installation.

**They are not trafficable unless stated, and are designed to carry the weight of the ceiling only.** Where a trafficable ceiling is required, install a proprietary trafficable ceiling system.

Strengthen suspension systems to support light fittings and access panels as shown in the detailing section of this manual and/or Rondo technical literature.

Any additional loads are not to be placed upon, or carried by the suspension system without the approval of Rondo Building Services or CSR Gyproc.

## Pressure Equalisation Air Grilles

Rooms which do not have permanently open air ventilation grilles should have grilles fitted in the doors to allow air pressure to equalise during opening/closing.

If no ventilation grilles are fitted to a room or its doors, CSR Gyproc recommends that each panel be held in place with Tile Hold-down Clips (N°703), to prevent tiles lifting under pressure fluctuations.

## Grid Installation

The following information assumes the room is diagonally square and the ceiling tiles are to be installed in a standard square-on-square pattern. Installation methods will need to be modified to allow for out of square rooms or other grid patterns, such as brick pattern, and to allow for light fittings, etc.

- For best appearance, the tiles closest to the walls may need to be cut to size to provide a symmetrical pattern. To determine the position of the grid, determine the number of 1200mm tiles that will fit the room dimension. Determine any remainder and add 1200mm. Divide this total by 2. This is the margin along each side of the room. Now determine the number of 600mm tiles that will fit the room dimension. Determine any remainder and add 600mm. Divide this total by 2. This is the margin at each end of the room.

### Example Grid Calculations:

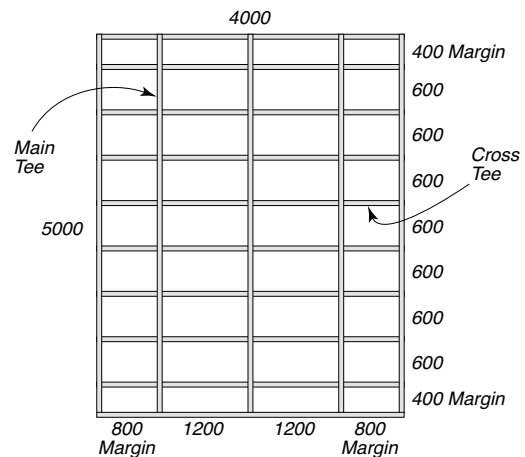
Main Tee Grid

- $4000 \div 1200 = 3.3$  modules
- $4000 - 3600$  (3 tiles) = 400
- $400 + 1200 = 1600$
- $1600 \div 2 = 800$  margin on each side of the room.

Cross Tee Grid

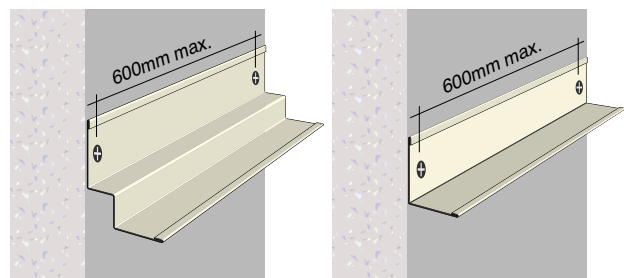
- $5000 \div 600 = 8.3$  modules
- $5000 - 4800$  (8 tiles) = 200
- $200 + 600 = 800$
- $800 \div 2 = 400$  margin at each end of the room.

Figure 395: Typical Grid Layout



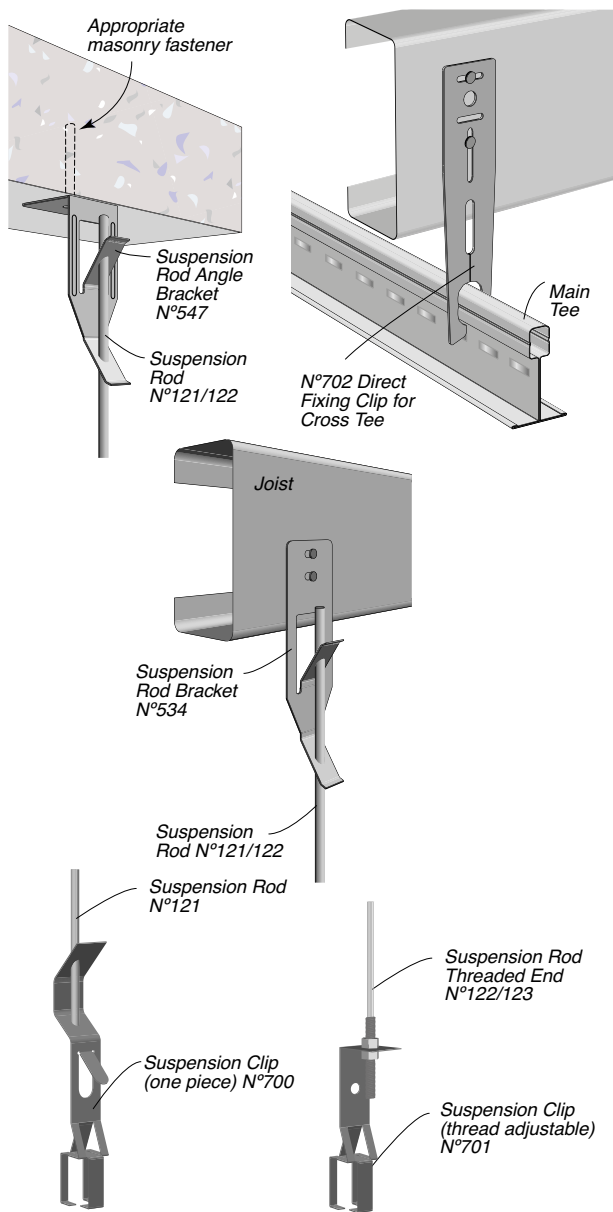
- Install selected wall trim with the bottom flange aligned at the required ceiling level. The ends should be mitre cut for a more attractive finish. Fix trim to the wall framing/masonry at the ends and at 600mm maximum centres between.

Figure 396: Wall Trim Fixing



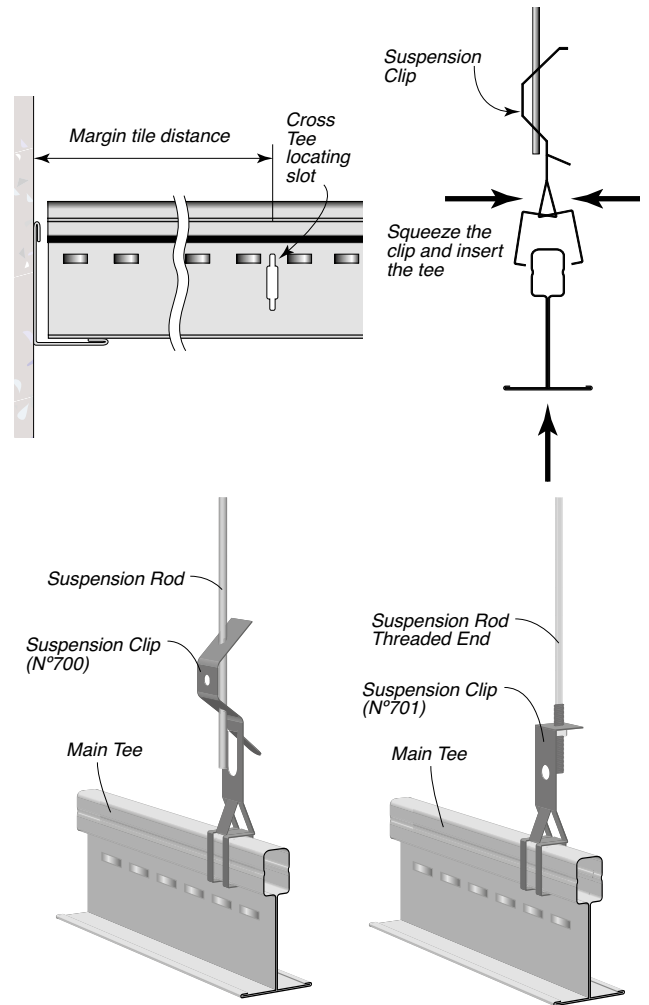
- Accurately position and fix suspension brackets to the floor/ roof structure to support Main Tees at 1200mm centres. (Accurate installation is important to ensure that Main Tees will be at 1200mm spacings).
- Insert rod into suspension brackets and clips.

Figure 397: Suspension Brackets



- Cut main tees so that the cross tee slots are appropriately located to suit the margin. Install Main Tees into the suspension brackets by squeezing the clip.

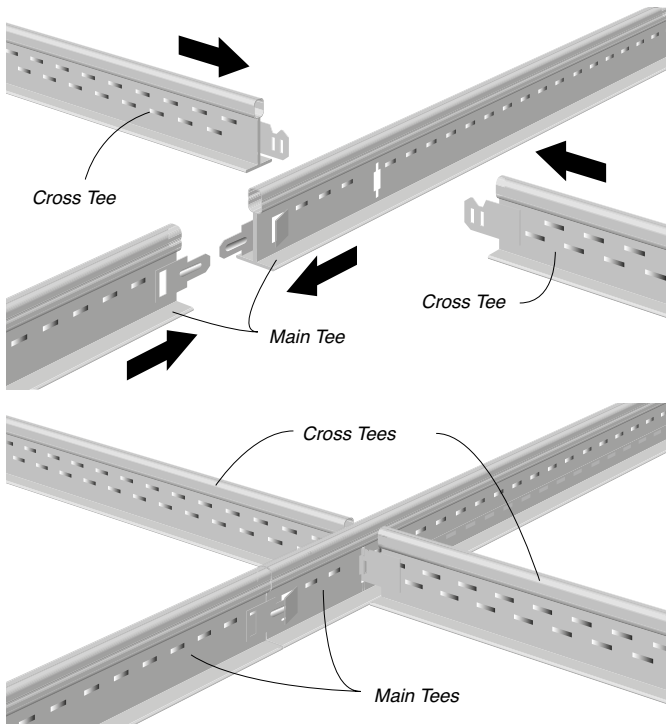
Figure 398: Installing Clips And Tees



- Join main tees by sliding the self locking end tabs together. Locate the outer ends of the main tees on the wall trim for stability.
- Install the self locking tabs of the cross tees through the pre-punched slots in the main tees and gently push to lock together forming a grid of 1200 x 600mm. Cut and install the outer cross tees on to the wall trim as described for the main tees.

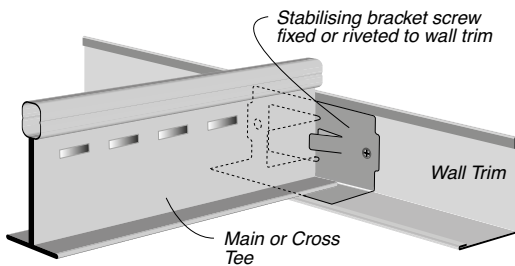


Figure 399: Joining Main Tees



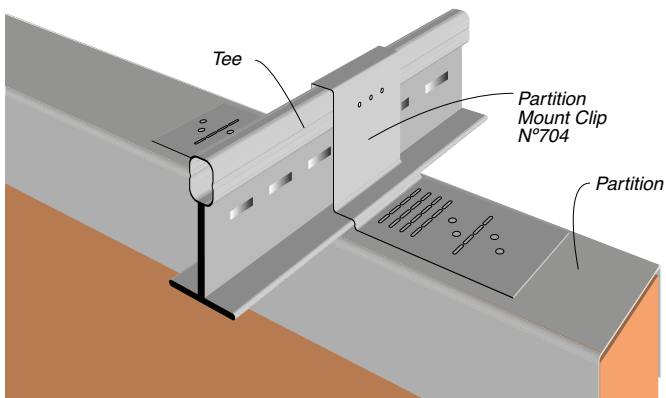
- Accurately align and level the grid. The suspension clips can be adjusted to either a string line or laser.
- To assist with stabilising the grid system in large ceiling areas, the Wall Trim Stabiliser N°705/706 should be attached to the wall trim at every second or third main and cross tee.

Figure 400: Wall Trim Stabiliser



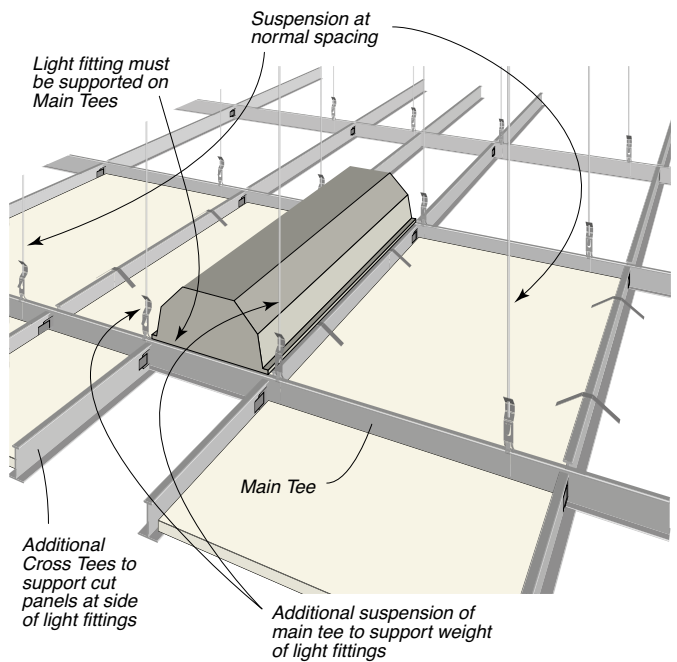
- Rondo Partition Mount Clip N°704 can be fixed to the top of the partition frame to connect the ceiling system to partitioning.

Figure 401: Wall Trim Stabiliser



- Light fittings must always be supported on main tees. **Additional suspension brackets, rods and clips MUST BE INSTALLED to support light fittings.** Refer to Rondo literature for maximum allowable loads for the grid.
- Additional cross tees will need to be installed to support tiles at the side of light fittings.

Figure 402: Typical Light Fitting Installation



## Tile Installation

**Clean hands or gloves are essential to prevent soiling of tile face during installation.**

- Remove protective plastic cover from tile face.
- Lift the tile through the grid and position face down on the bottom flanges of the grid main/cross tees.
- Fit Hold-down Clips to cross tee top flange, and bend hold-down flanges downward to prevent tiles lifting.

Figure 403: Tile Hold-Down Clip

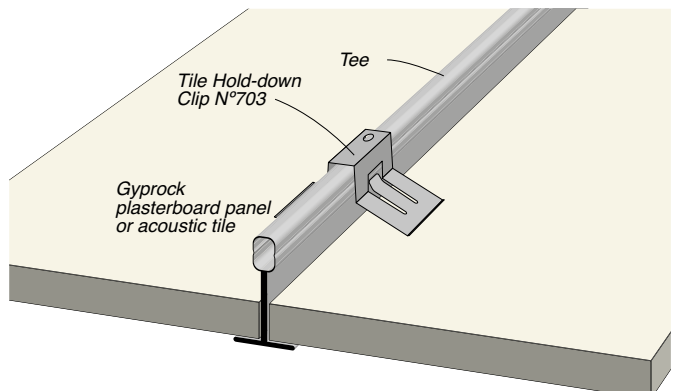




Figure 404: Suggested Bulkhead Detail (Maximum Drop 600mm) Horizontal Exposed Grid/Vertical Screw-Up System

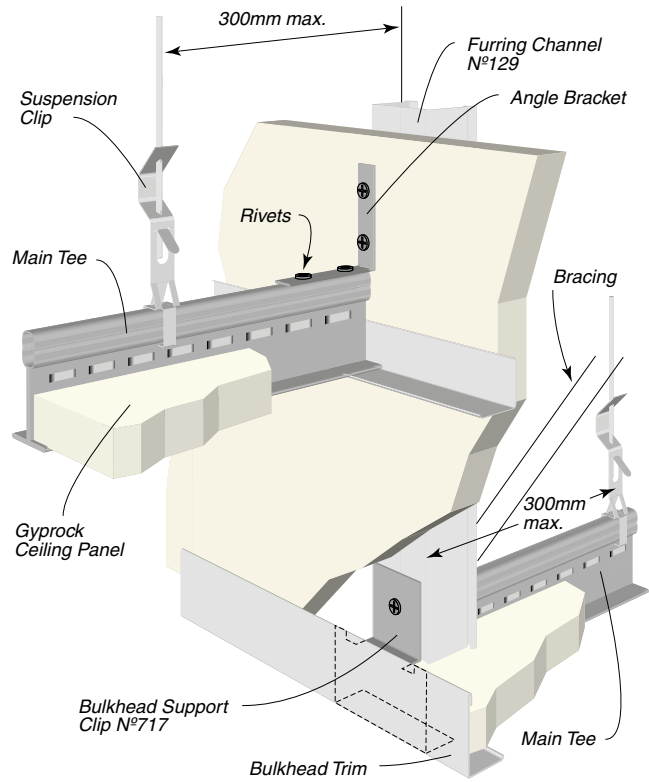
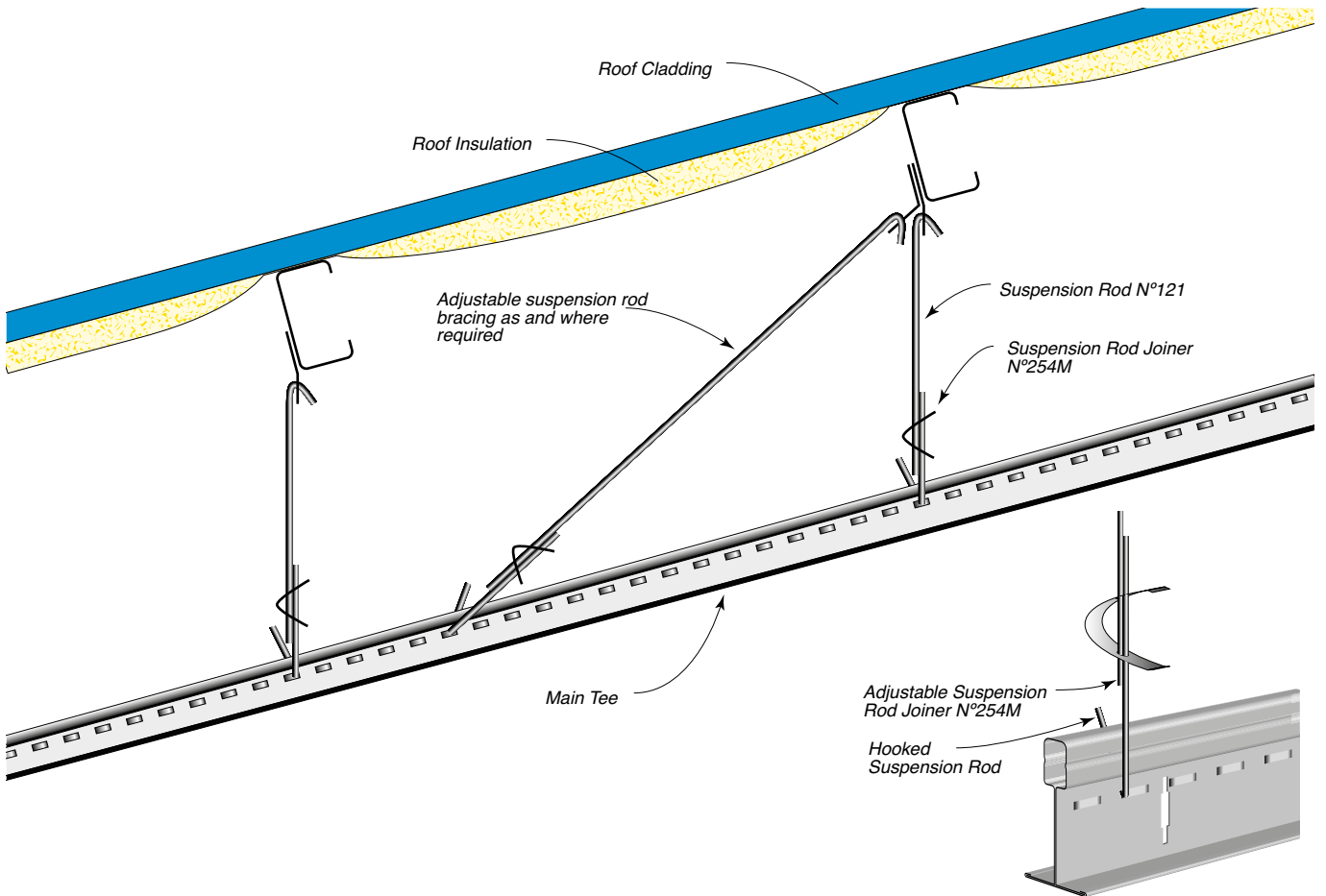
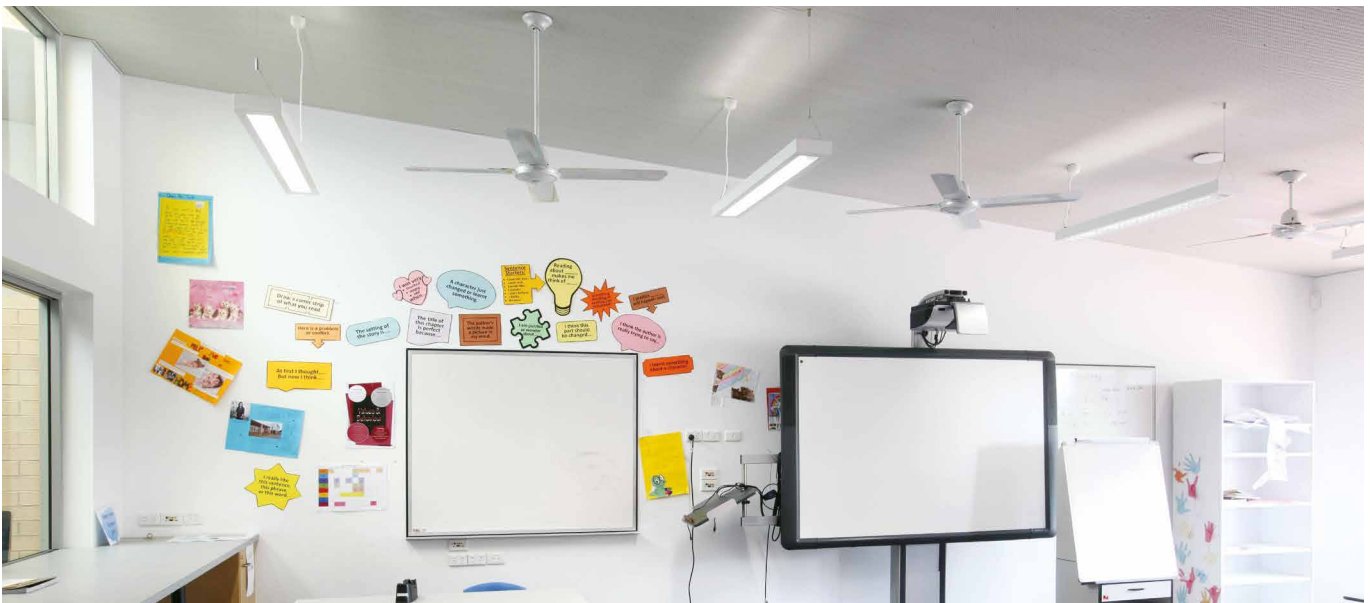
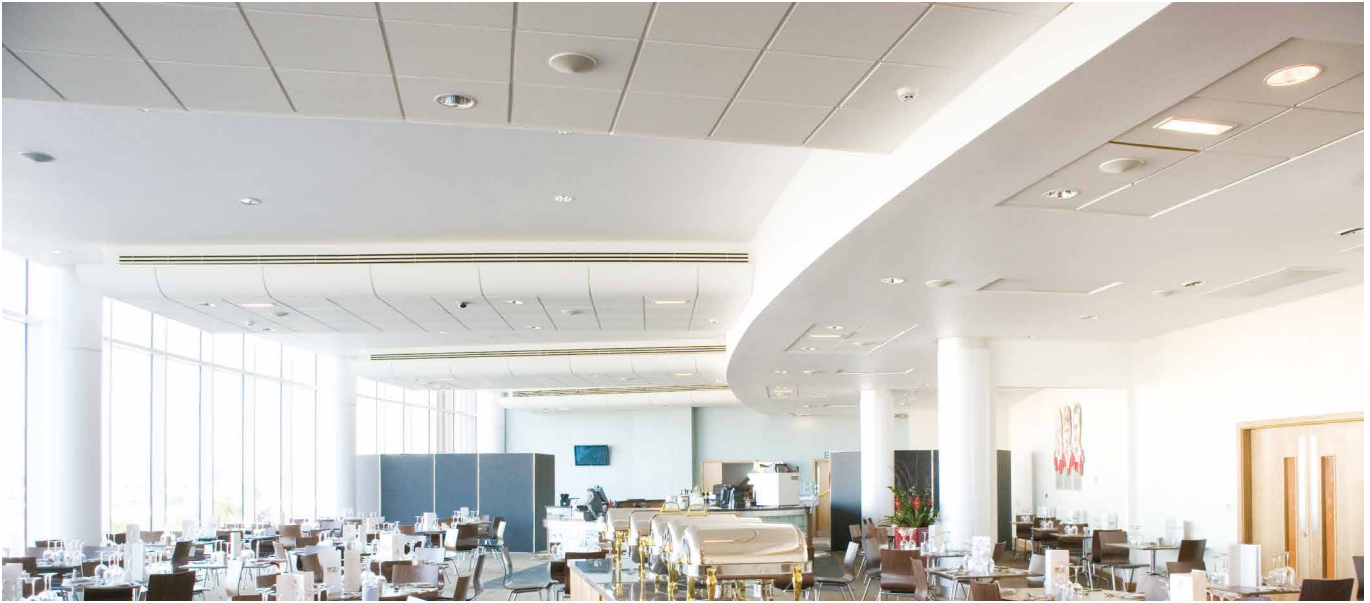


Figure 405: Suggested Raked Ceiling Detail (Maximum Pitch 45°)





# Gyprock Jointing & Finishing Systems

## Introduction

Jointing and finishing of Gyprock plasterboard interior installations is to be carried out in accordance with Figure 3 and Table 49 or Table 50 in this publication, and the following details, so as to provide a smooth surface for decorating.

Stopping and external corner beads are to be applied to all edges subject to damage.

A Level 4 Finish is generally the recommended level of finish for commercial construction as detailed in AS/NZS2589.1. This requires a three coat system, consisting of:

- tape and tape coat
- second coat, and
- finish (or topping) coat.

In fire rated systems and acoustic systems with multiple board layers, a different level of finish may be specified, and back-blocking of joints is not required. For additional requirements for Levels 3, 4 and 5 Finishes, refer to Table 6. In the instance of Rigitone perforated plasterboard, a specialty jointing system is used. For details on this style of jointing, please refer to page 188..

Gyprock® One Finish assists in achieving the highest criteria of a uniform and smooth Level 5 finish on plasterboard walls and ceilings subject to critical lighting conditions. Gyprock One Finish is a pre-mixed acrylic compound designed to create a uniform surface on interior walls and ceilings affected by

critical lighting conditions. The application of One Finish over a standard level 4 finish will improve the final surface and minimise the effects of critical light, however it will not automatically upgrade the work to a level 5 finish.

## Applications

The 3-coat plasterboard jointing process is used in most areas of commercial construction. Whether a project site has access to clean water for mixing dry compounds, or requires a ready-to-use pre-mixed option, Gyprock has a jointing solution to suit.

Joints are achieved using high quality Gyprock compounds. Jointing compounds are classified as either setting type or drying type. Setting type compounds produce stronger joints and reduce installation delays and shrinkage associated with drying-type compounds, have a defined setting time e.g. 20, 45, 60 or 90 minutes, and require on-site mixing.

**Setting type compounds:** Base Coat 20, Base Coat 45, Base Coat 60, Base Coat 90 and Ultra-Base MR 60. These are supplied in dry format and mixed with water on-site.

**Drying type compounds:** Wet Area Base Coat, Easy-Base, Pre-Mixed Total Joint Cement, Easy-Flow, Ultra-AP, Jointmaster, Easy-Finish, and Ultra-Top, supplied as pre-mixed product.

All compounds can be applied by hand or with mechanical jointing tools.





## Gyprock Jointing Compounds

Gyprock jointing compounds are classified as either setting type or drying type.

Setting type compounds have a defined setting time e.g. 20, 45, 60 or 90 minutes.

In 3 coat jointing applications, a drying type compound must be used as a finish coat and must be completely dry before sanding. This usually takes about 24 hours.

Drying type compounds will shrink and harden with evaporation of water. The joints must be allowed to set and appear completely dry before re-coating or sanding. Actual drying times will be extended in low temperature and high humidity conditions. Do not use a setting type compound over a drying type compound.

Note that Gyprock Wet Area Base Coat sets very hard; apply accurately to avoid the requirement to sand.

All compounds can be applied by hand or with mechanical jointing tools.

## Jointing Perforated Plasterboard

Tape and set joints using only approved Gyprock jointing systems and use as detailed later in this guide.

Due to the location of the perforations close to the edge of panels, butt joints are of a narrower width than is normal. Special care should be taken to ensure a good joint finish without filling of perforations.

With Rigitone perforated plasterboard, a specialty jointing systems is used. For details on this style of jointing, please refer to page 188.

## Jointing Wet Areas

It is recommended that Gyprock Ultra-Base MR 60 or Wet Area Base Coat be used at sheet joints in areas that are required to be waterproof or water resistant. Set all joints with paper tape. When the tape coat has dried, apply a second coat of the same compound and cover all fastener heads.

Joints in wet areas that are not tiled and not required to be waterproof or water resistant should be set with Gyprock compounds and tape as detailed for Level 4 or Level 5 finishes.

## Jointing Tape

Gyprock Paper Tape and Fiba-Fuse tape have been developed to enable the preparation of strong joints and should be used on all butt and recess joints, and internal corners.

## Site Mixing of Compounds

The first step to achieving good jointing is proper mixing of the compound.

- Always use clean containers and mixing equipment as contamination by previously set compound will accelerate setting time.
- Always use clean water of drinking quality.
- Never mix different compounds together or mix old batches with new ones.
- Follow mixing instructions printed on each bag.
- Use compounds before the Best Before date printed on the packaging.

### Important

When setting type compounds are used during hot, dry conditions, rapid evaporation of water and increased absorption by the lining surface can prevent the compound from setting correctly. This will result in the compound being soft and weak.

If jointing must be carried out under severe drying conditions, use fast setting products such as Base Coat 45 and mix only small quantities of compound. The compound should then be left standing for approximately 15 minutes to ensure that it sets soon after application to the joints. Additionally, depending on the severity of the drying conditions, the surface of the area to be jointed may require wetting with a brush before applying the compound.

Drying-type compounds should not be used when the interior temperature is less than 10°C.

### Preparation

Fill any voids deeper than 4mm and gaps greater than 3mm wide with Base Coat and allow to dry before jointing. All surfaces must be free of dirt, oil or foreign matter that could reduce bond.

Table 49: Jointing Compound Selection – Hand Or Mechanical Application

<b>Tape Coat</b>	<b>Second Coat</b>	<b>Finish Coat</b>
Any of the following:	Any of the following:	Any of the following:
Base Coat 20 Base Coat 45 Base Coat 60 Base Coat 90 Ultra-Base MR 60 Easy-Base Pre-Mixed Total Joint Cement Easy-Flow Ultra-AP Wet Area Base Coat	Base Coat 20* Base Coat 45* Base Coat 60* Base Coat 90* Ultra-Base MR 60* Easy-Base Pre-Mixed Total Joint Cement Easy-Flow Ultra-AP Wet Area Base Coat	Jointmaster  Ultra-Top  Pre-Mixed Total Joint Cement  Easy-Finish  Easy-Flow  Ultra-AP
* Setting type compound. Do not use a setting compound over a drying type compound. For protected exterior applications, use Wet Area Base Coat or Ultra Base MR 60 for tape and second coat, followed by a Gyprock Finish Coat.		

Table 50: Jointing System Selection – Tiled Areas

<b>Wall</b>	<b>Tape Coat</b>	<b>Second Coat</b>	<b>Finish Coat</b>
Waterproof or water resistant	Wet Area Base Coat Ultra-Base MR 60	Wet Area Base Coat Ultra-Base MR 60	Nil
Other areas	Base Coat 20 Base Coat 45 Base Coat 60 Base Coat 90 Ultra-Base MR 60	Base Coat 20 Base Coat 45 Base Coat 60 Base Coat 90 Ultra-Base MR 60	Nil

Table 51: Approximate Quantities Per 100M<sup>2</sup> Gyprock Plasterboard (Horizontal Sheeting)^

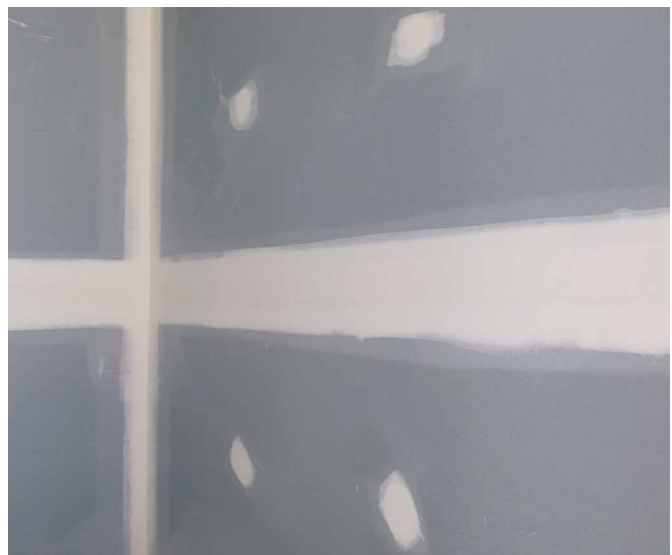
Tape + Second Coats		Approx Qty	Finish Coat		Approx Qty
Base Coat 20/45/60/90		16kg	Jointmaster		10kg
Ultra-Base MR 60		13kg	Ultra-Top		6kg
Ultra-AP		18.5kg	Ultra-AP		5.7kg
Easy-Flow		21kg	Easy-Flow		7kg
Pre-Mixed Total Joint Cement		31kg	Easy-Finish		8kg
Easy-Base		24kg	Pre-Mixed Total Joint Cement		10kg
Wet Area Base Coat		15kg			

^ Allow 20% more jointing material for vertical sheeting.

## Jointing With Mechanical Tools

The use of mechanical tools to joint Gyprock plasterboard is very popular, and used correctly, these tools can significantly increase productivity by cutting the amount of time taken to finish a job. Gyprock supplies an extensive range of mechanical jointing tools to increase productivity and reduce physical stresses on operators. Please contact your local Gyprock centre for details.

Premixed compounds should be used directly from the bucket, but can, if necessary, be thinned down with water, used sparingly. Follow the instructions provided on the product packaging.





## Mechanical Jointing of Recessed Joints & Back-blocked Butt Joints

### Tape Coat

- Using a taping machine, apply tape and compound centrally to the recessed joint.
- Using a joint knife, immediately press tape into the joint and cover the tape with a thin coat of compound. Feather the edges and clean off excess compound.

### NOTE

A minimum 1mm compound is to be left under the tape.

- Cover all fastener heads and fill any surface damage with compound.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

### Second Coat

- Using a 200mm plaster box, apply a second coat to the recessed joint.
- Cover fastener heads with a second coat of compound, laid in a different direction, and extending beyond the first coat by about 25mm.
- Allow compound to set/harden before proceeding.

### Finish Coat

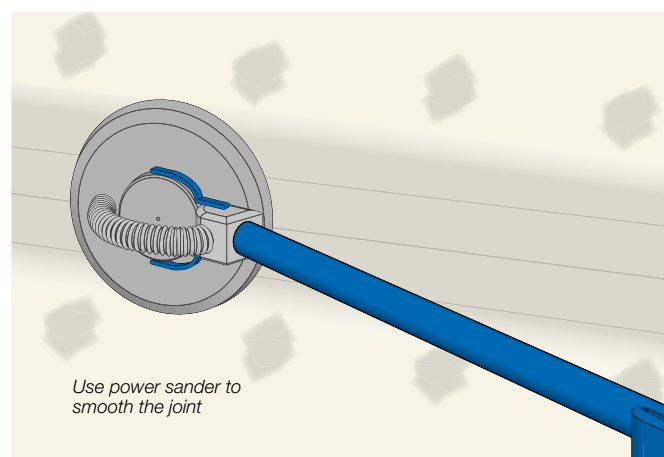
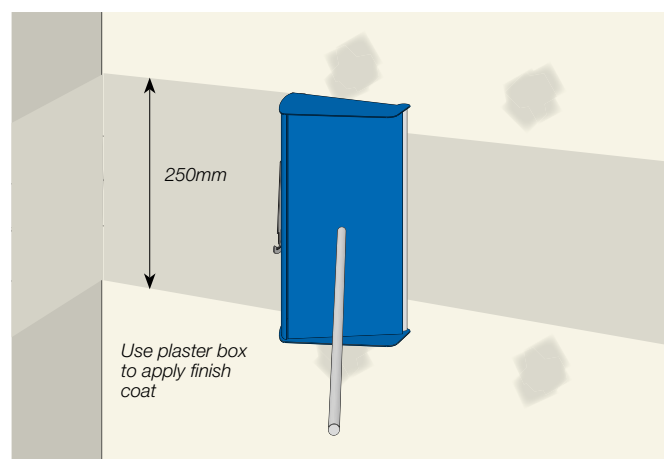
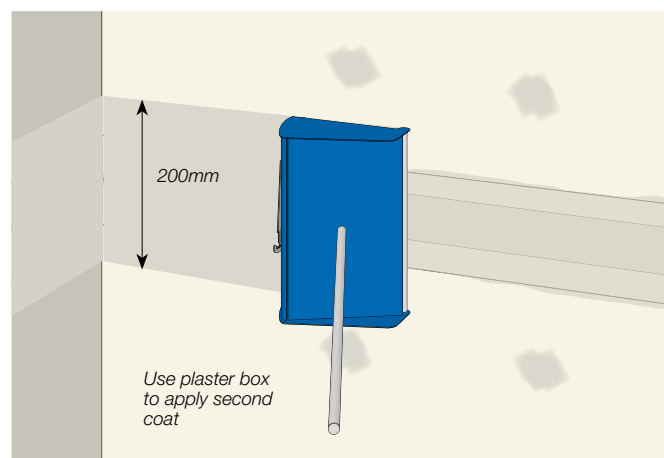
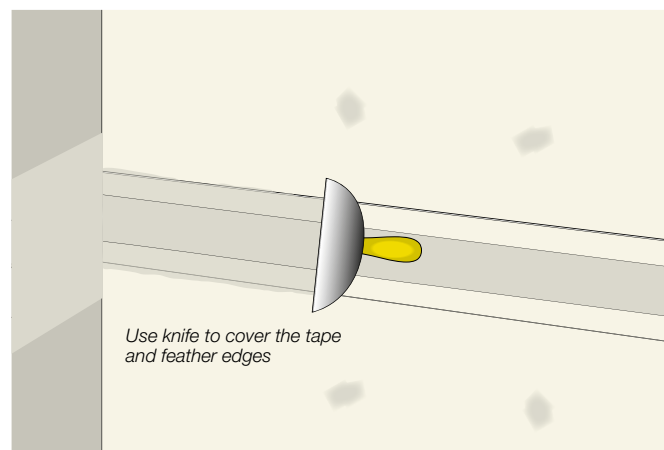
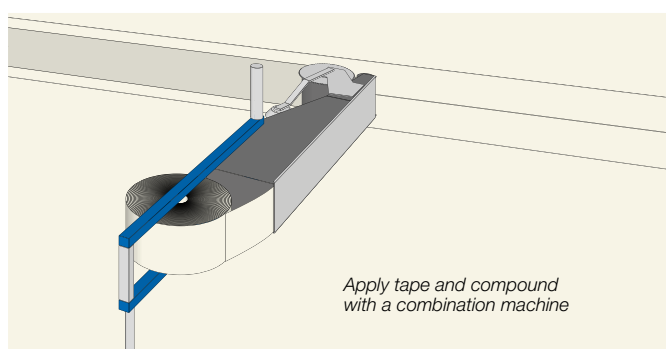
- Using a 250mm plaster box, apply third coat to the recessed joint.
- Cover fastener heads with a third coat of compound, laid in a different direction, extending beyond the previous coat by about 25mm. Ensure that the edges of the compound are neatly feathered and that there are no trowel edge marks left in the final stopping.
- Allow compound to harden before proceeding.

### Sanding

- Use a power sander to smooth the joint.

**Caution:** If previous coats of drying type compounds are not thoroughly dry before application of subsequent coats, imperfections can result from delayed shrinkage of the compound.

Figure 406: Procedure For Mechanical Jointing Of Recessed Joints & Back-Blocked Butt Joints



## Mechanical Jointing of Butt Joint Formed on Framing

### Tape Coat

- Using a taping machine, apply tape and compound centrally to the recessed joint.
- Using a joint knife, immediately press tape into the joint and cover the tape with a thin coat of compound. Feather the edges and clean off excess compound.

### NOTE

A minimum 1mm compound is to be left under the tape.

- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

### Second Coat

- Using a 200mm plaster box (adjusted to reduce centre build-up), apply a second coat to each side of the butt joint.
- Allow compound to set/harden before proceeding.

### Finish Coat

- Using a 250mm plaster box (adjusted to reduce centre build-up), apply a third coat to each side of the butt joint.
- Allow compound to harden before proceeding.

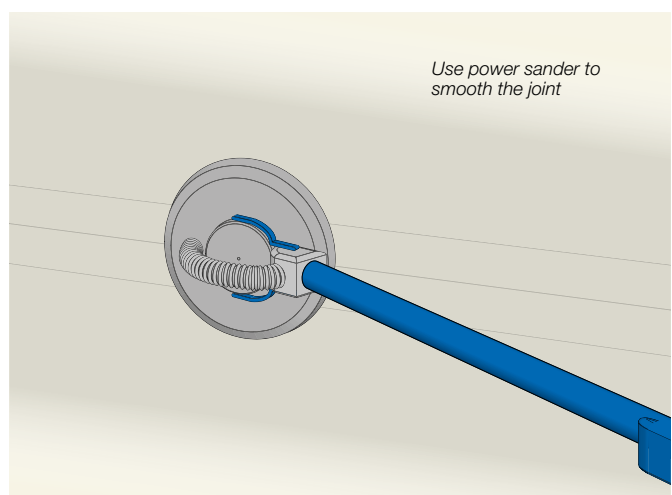
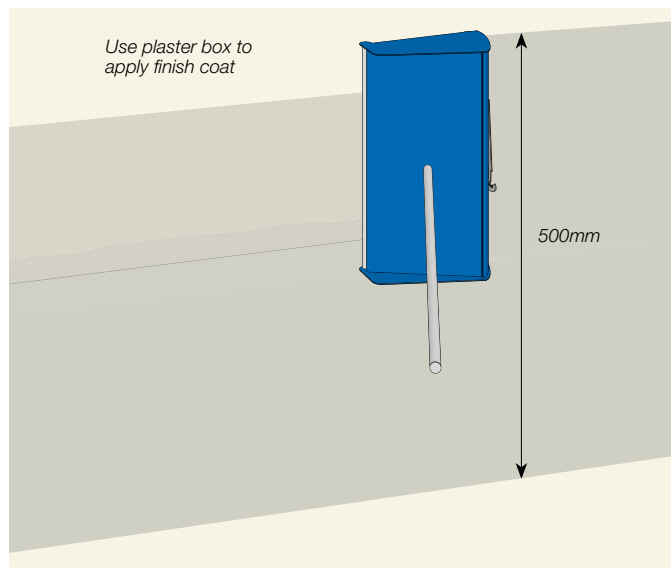
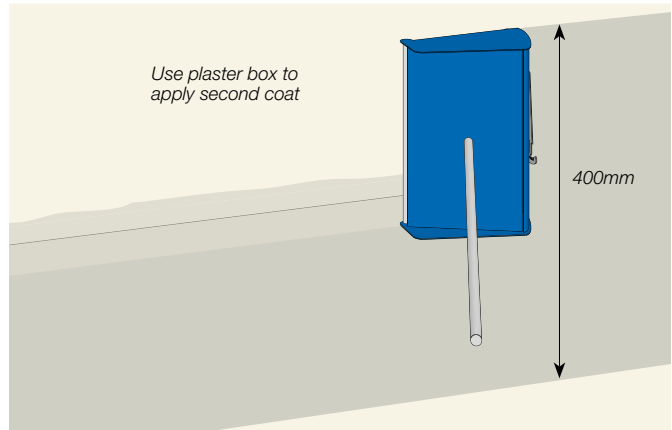
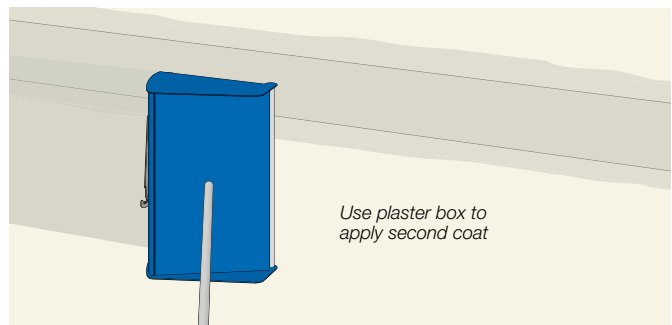
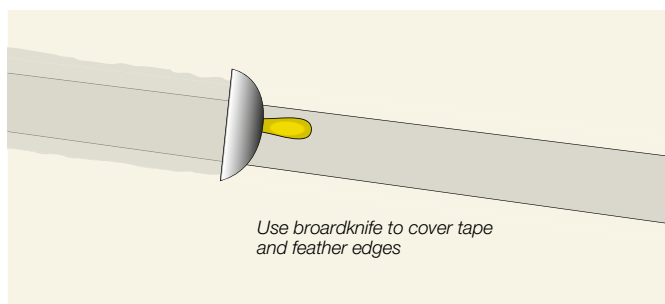
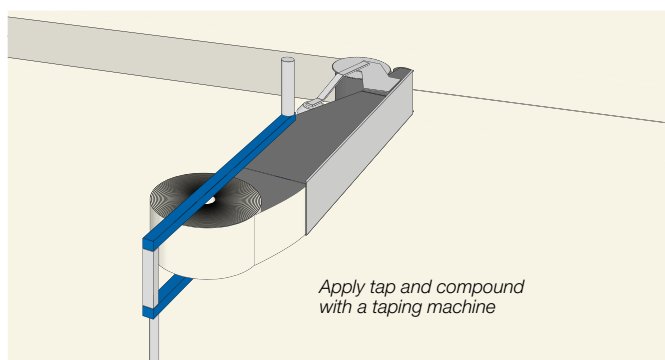
### Sanding

- Use a power sander to smooth the compound.

### Sanding

- Use a power sander to smooth the compound.

Figure 407: Procedure For Mechanical Jointing Of Butt Joint Formed On Framing



## Mechanical Jointing of Internal Corners

Remove debris from corner and floor.

### Tape Coat

- Using a taping machine with tape creaser in place, apply tape and compound centrally to the joint.
- Follow immediately with a corner roller, pressing tape into the joint.
- Using a glazing tool, cover the tape with a thin coat, feather the edges and clean off excess compound.

### NOTE

- A minimum 1mm compound is to be left under the tape.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

### Finish Coat

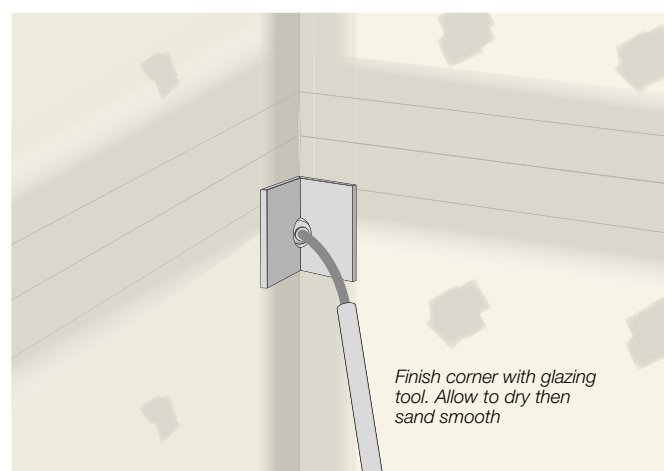
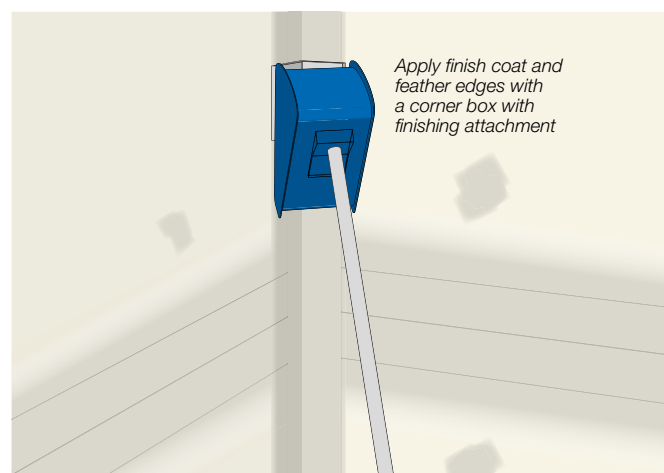
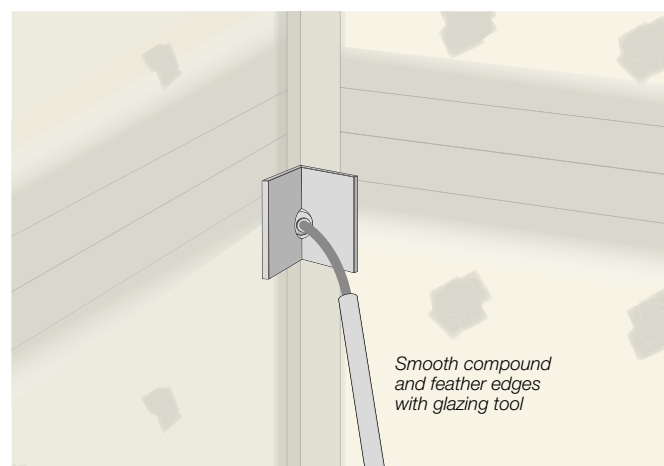
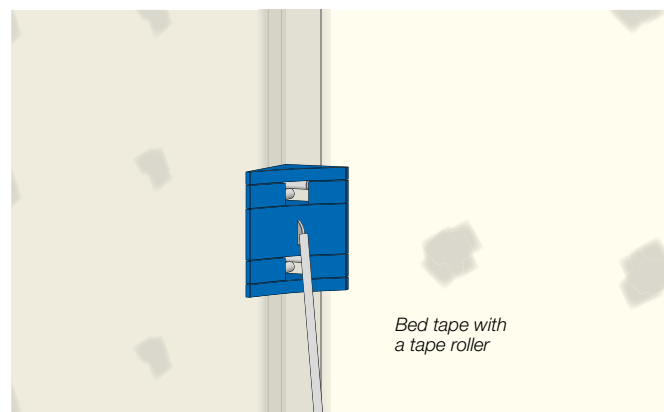
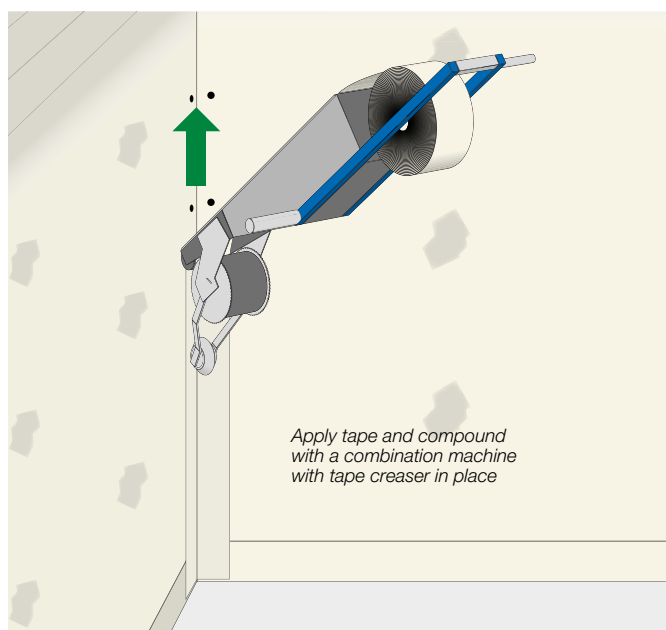
- Using a corner box with finisher attachment or corner glazer, apply a thin coat of finishing compound over the tape coat, ensuring that the edges are well feathered.
- Smooth joint with glazing tool.
- Allow compound to harden before proceeding.

### Sanding

- Hand sand smooth with 150/180 grit paper or cloth, or with 220 grit sanding mesh and a sanding block.

**Caution:** If previous coats of drying type compounds are not thoroughly dry before application of subsequent coats, imperfections can result from delayed shrinkage of the compound.

Figure 408: Procedure For Mechanical Jointing Of Internal Corners



## Mechanical Jointing of External Corners

### Apply Corner Bead

- Position external angle bead over the corner and sight it to ensure straightness before fastening both flanges at 300mm centres.
- Using a joint knife, cover the bead with a thin coat. Feather the edges and clean off excess compound.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

### Second Coat

- Using a plaster box, with bead guide attached, apply a minimum 140mm width compound coat to each side of the corner. This will also feather the edges.
- Allow compound to set/harden and trim excess material.

### Finish Coat

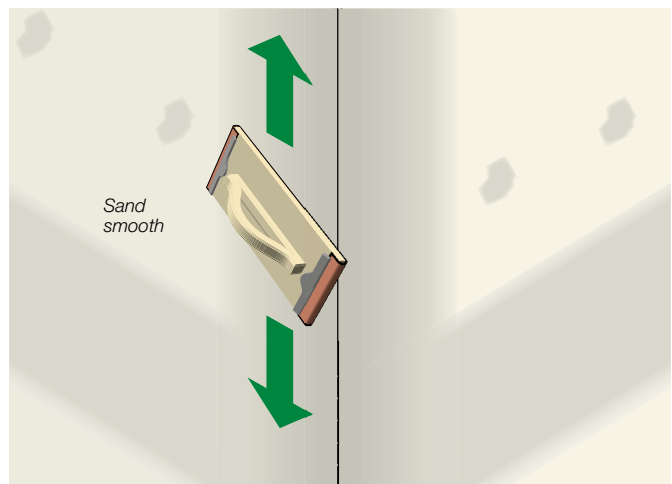
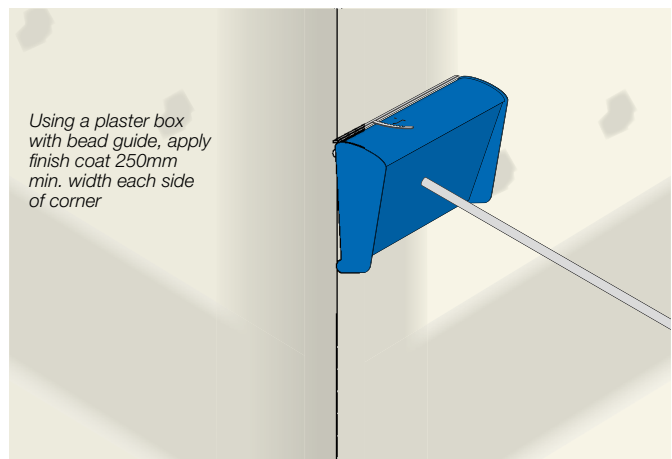
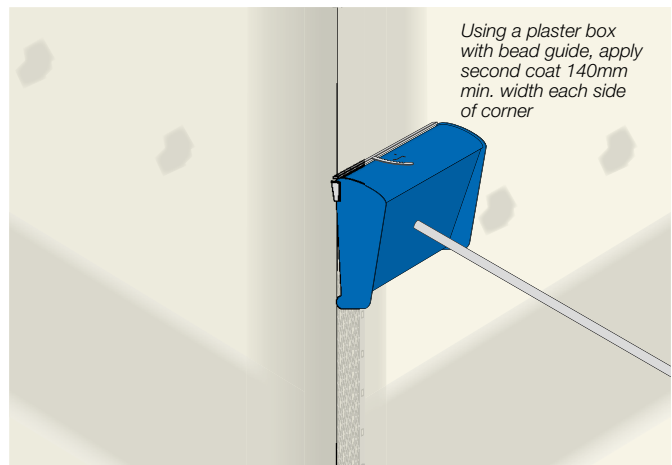
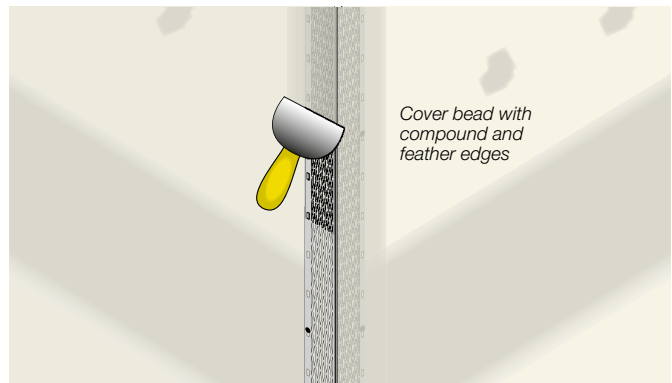
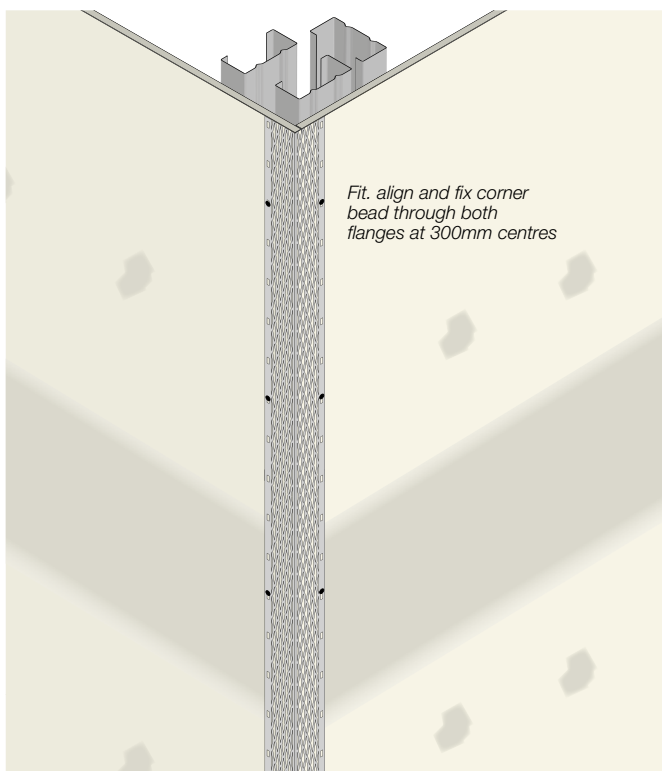
- Using a 250mm plaster box, with bead guide attached, apply a finish coat each side of the corner.

### Sanding

- Hand sand smooth with 150/180 grit paper or cloth, or with 220 grit sanding mesh.

**Caution:** If previous coats of drying type compounds are not thoroughly dry before application of subsequent coats, imperfections can result from delayed shrinkage of the compound.

Figure 409: Procedure For Mechanical Jointing Of External Corners



## Jointing Hand Applied

### Hand Jointing of Recessed Joints & Back-blocked Butt Joints

Curved or straight trowels may be used for setting recessed and back-blocked butt joints. Under normal pressure, a curved trowel deflects and can assist in the preparation of flatter and more consistent joints. A 200mm trowel is recommended for second coat application, while a 250mm trowel is recommended for the finish coat.

#### Tape Coat

- Fill recess in plasterboard evenly and fully with compound using a 150mm broadknife.
- Bed in Gyprock Paper Tape centrally over the joint and cover lightly with compound.

#### NOTE

A minimum 1mm compound is to be left under the tape.

- Cover all fastener heads and fill any surface damage with compound.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

#### Second Coat

- Apply a second coat, about 170mm wide, finishing slightly above the board surface, and feather joint edges.
- Cover fastener heads with a second coat of compound, laid in a different direction, and extending beyond the first coat by about 25mm.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

#### Finish Coat

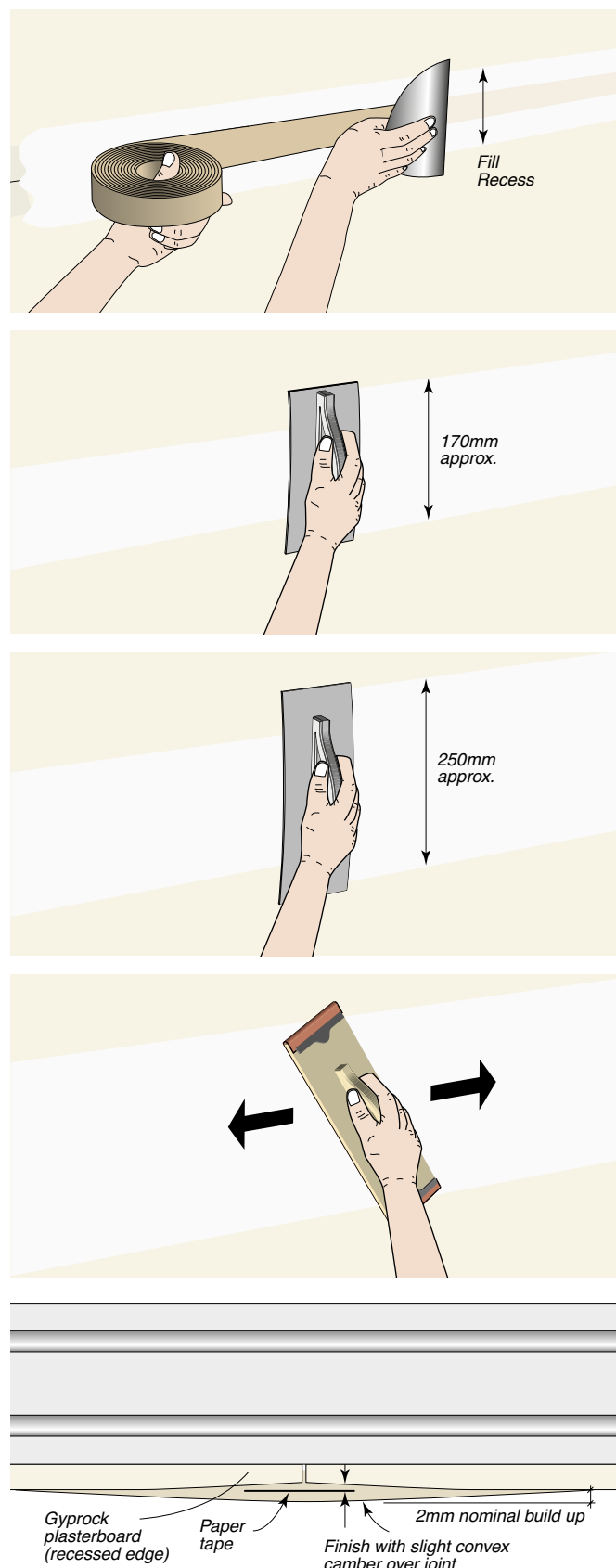
- Apply a thin finish coat of topping compound centrally over the previous coat, about 250mm wide. Feather the edges of the compound with the trowel.
- Cover previously stopped fastener heads with a third coat of compound, laid in a different direction, extending beyond the previous coat by about 25mm. Ensure that the edges of the compound are neatly feathered and that there are no trowel edge marks left in the final stopping.
- Allow the finish coat of compound to dry for at least 24 hours before proceeding.

#### Sanding

- Sand smooth with 150/180 grit paper or cloth, or with 220 grit sanding mesh. Avoid any heavy pressure which might scuff the linerboard.

**Caution:** If previous coats of drying type compounds are not thoroughly dry before application of subsequent coats, imperfections can result from delayed shrinkage of the compound.

Figure 410: Procedure For Hand Jointing Of Recessed Joints





## Hand Jointing of Butt Joints Formed on Framing

### Tape Coat

- Apply a thin layer of compound over the joint.
- Bed Gyprock Paper Tape and apply a thin coat of compound over the top of the tape. The compound must be spread approximately 120mm each side of the joint.

### NOTE

A minimum 1mm compound is to be left under the tape.

- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

### Second Coat

- Apply a second coat of compound about 170mm wide to each side of the joint. This should have a gradual convex camber over the joint surface.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.

### Finish Coat

- Apply a finish coat of topping compound centrally over the previous coat to form an even camber over the joint about 250mm each side of the joint. Soften the outer edges of the compound with a damp water brush or sponge before feathering the edges with the trowel.
- Allow the finish coat of compound to dry for at least 24 hours before proceeding.

### Sanding

- Sand smooth with 150/180 grit paper or cloth, or with 220 grit sanding mesh.
- Finished joints should have an even and slightly convex camber from edge-to-edge as shown.

**Caution:** If previous coats of drying type compounds are not thoroughly dry before application of subsequent coats, imperfections can result from delayed shrinkage of the compound.

Figure 411: Jointing Of Butt Joints Formed On Framing

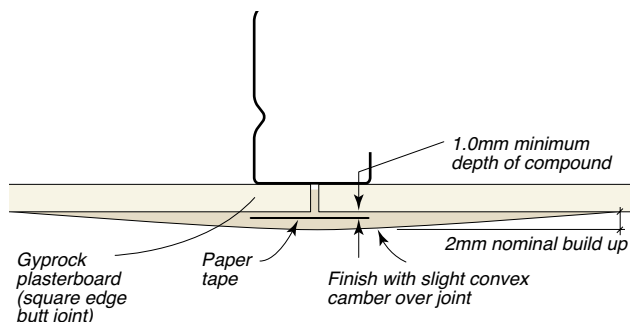
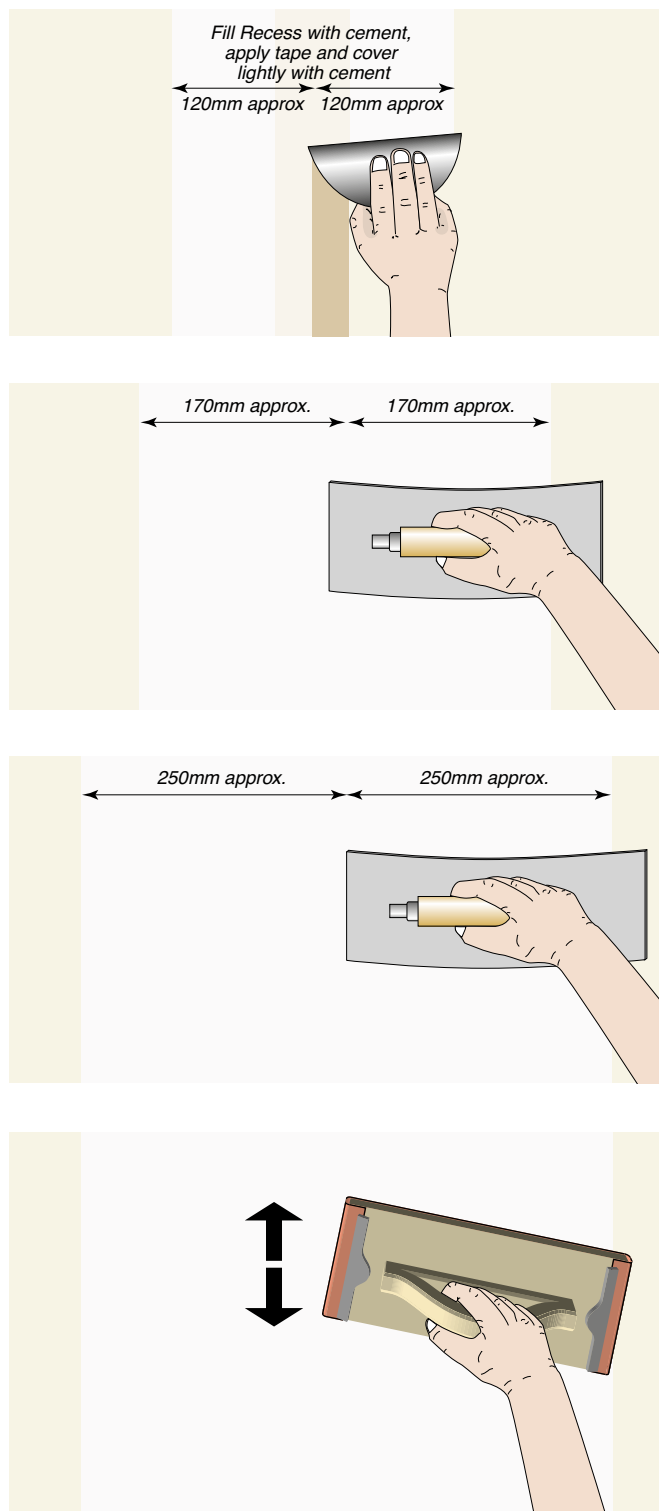


Figure 412: Procedure For Hand Jointing Of Butt Joints



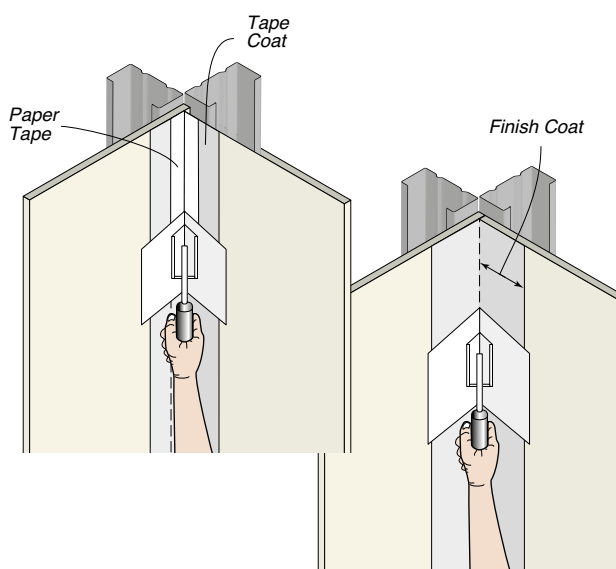
## Hand Jointing of Internal Corners

- Apply a tape coat to both sides of the corner, bed in the tape centrally over joint and cover lightly with compound.

### NOTE

- A minimum 1mm compound is to be left under the tape.
- Allow setting-type compounds to set completely, and drying type compounds to harden for 24 hours before proceeding.
- When the tape coat is dry, apply a thin coat of finishing compound over the tape coat to a width of at least 100mm, ensuring that the edges are well feathered.
- When dry, sand smooth with 150/180 grit paper or cloth, or with 220 grit sanding mesh.

Figure 413: Procedure For Hand Jointing Of Internal Corners



## Hand Jointing of External Corners & Arch Beads

- Position external angle bead over the corner and sight it to ensure straightness before fastening both flanges at 300mm centres.
- External corners and arch beads are finished with a three coat compound system applied to the same specifications as for joints. The finish coat should be at least 250mm wide each side of the corner.
- When compound is dry, sand smooth with 150/180 grit paper or cloth, or with 220 grit sanding mesh.

Figure 414: Jointing Of External Corners

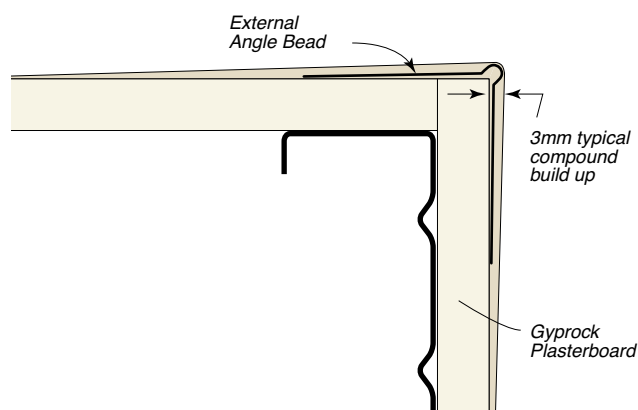
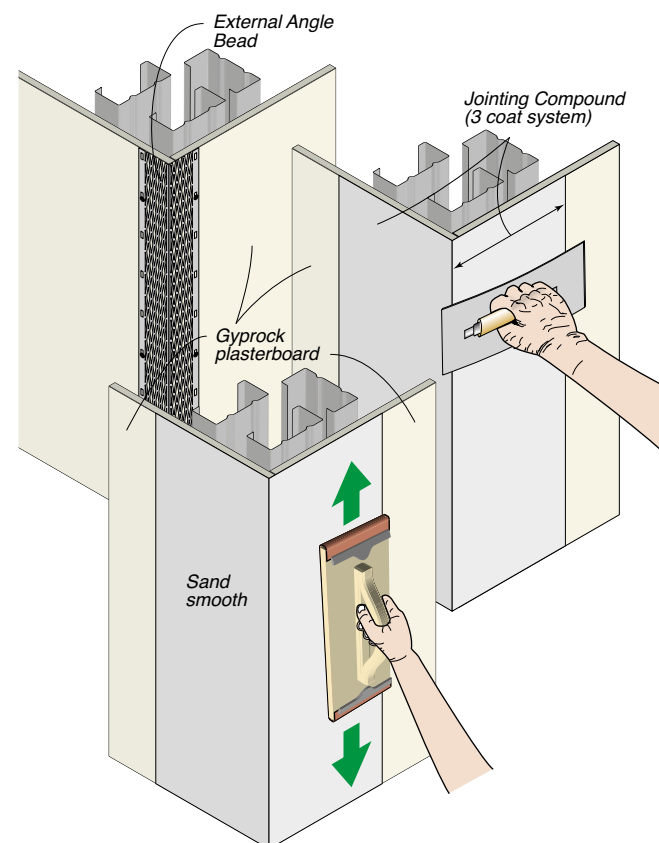


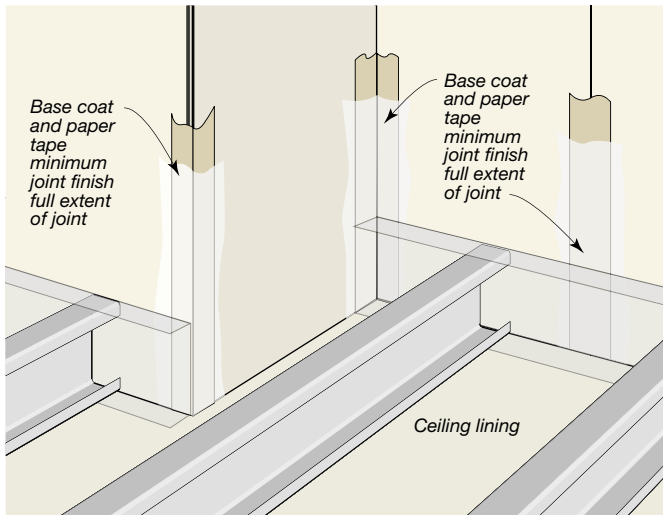
Figure 415: Procedure For Hand Jointing Of External Corners



## Jointing in Non-Visible Areas

In fire or acoustic rated systems, all outer layer joints and corners, including those in non-visible areas such as ceiling voids, must be finished with a minimum of base coat and paper tape.

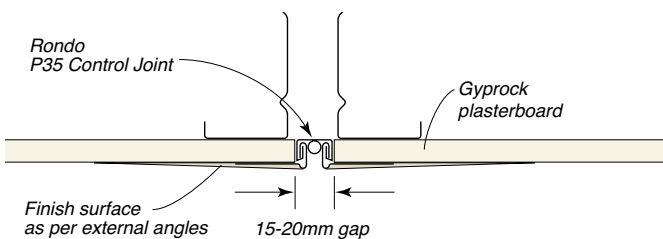
**Figure 416: Minimum Jointing Requirements For Fire Or Acoustic Rated Systems In Non-Visible Areas**



## Installation of P35 Control Joint

- Allow a 15-20mm gap between ends of sheets.
- Locate control joint, Rondo N°P35, centrally in gap. Fasten flanges and sheets to frame at a maximum of 300mm centres.
- Set over bead as for normal joint application using centre channel ribs as screeding guides.
- Finish the joint in the normal manner.
- When the joint is dry, remove the filament tape.

**Figure 417: Installing A P35 Control Joint**



## Cornice Fixing

Gyprock Cornice is designed to provide an attractive finish at the junction of the wall and ceiling. It can be used on Gyprock plasterboard, fibrous plaster or cement rendered surfaces.

The cornice is composed of gypsum plaster encased in a strong linerboard.

Gyprock Cornice Cement 45/60/90 is formulated for adhesion of cornice to plasterboard surfaces. For material other than plasterboard, such as fibre cement, plaster glass, cement render, or highly absorbent surfaces, Gyprock Masonry Adhesive is recommended. In Western Australia Gyprock Cornice Cement 60 may be used as an alternative.

Installation of 100 lineal metres of standard cornice requires approximately 12kg of cornice cement.

### Important

When cornice cements are used in hot, dry conditions, the water in the mix can evaporate or be absorbed into the dry lining surfaces. In this situation the cement will not set correctly and will be lacking in strength.

Under severe drying conditions, use a faster setting cornice cement such as Cornice Cement 45. Mix only small quantities of cement and allow to stand for 10 to 15 minutes to ensure that it sets soon after application.

Butter cement to one length of the cornice only before installation. In addition, depending on the severity of drying conditions, the contact surfaces may require dampening with a water brush before applying the cement.

The best adhesion is to unpainted plasterboard. Where cornices are to be fixed to surfaces that are painted, additional preparation is required:

- For low gloss acrylic paint, sand painted surfaces.
- For high gloss acrylic or oil based paint, coat with a PVA adhesive such as Bondcrete.

Cornice Cement may not bond well to ceramic tiles. When fixing cornice to wall tiles and a plasterboard ceiling, additional strength is required. If possible, bond the cornice to plasterboard above the tiles, otherwise use screws or nails to the ceiling plasterboard. Gyprock Wet Area Acrylic Sealant may be used to seal any gaps to the tiles. Support cornice for 24 hours or until adhesive is dry.

## Cornice Fixing (Mechanical or Hand Fixing)

### Prepare

- To ensure equal projection on wall and ceiling surfaces, measure down from the ceiling surface and mark lines on the walls at; 55mm down for the 55mm cornice; 90mm down for the 90mm cornice; and 75mm down for the 75mm cornice.
- Mark and cut the cornice to the actual length required.
- All corner angles are to be mitred. When cutting mitres, use a mitre box with the cornice orientated as it is to be mounted. Where butt joints are unavoidable, prepare ends so that they will accurately butt together.

### Apply Cornice Adhesive

- Using an applicator tube, apply cornice cement to wall/ceiling junction. Ensure adequate amount of adhesive is applied.

OR

- Butter 20-30mm wide beads of cement along the full length of each back edge of the cornice and to each mitre and butt joint.

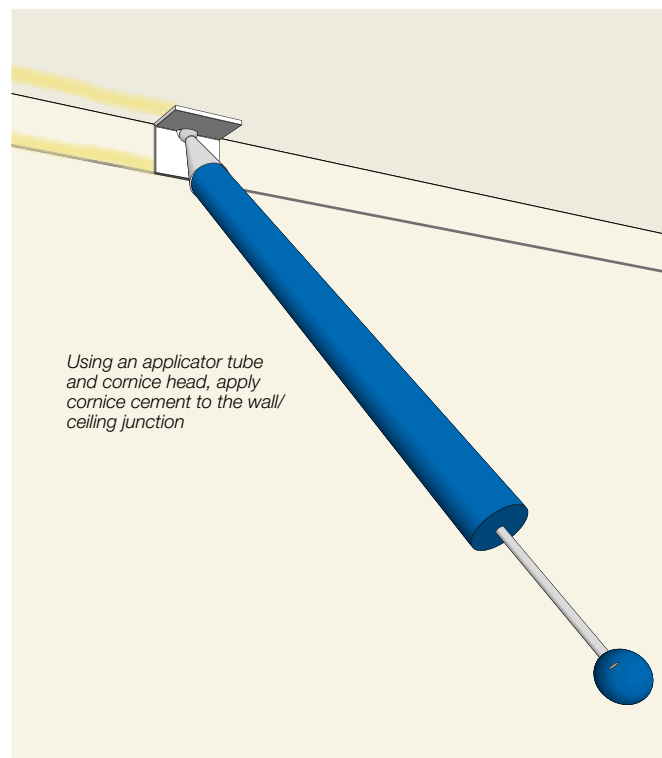
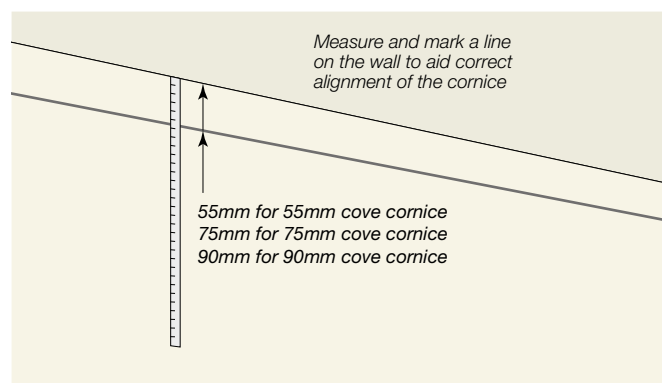
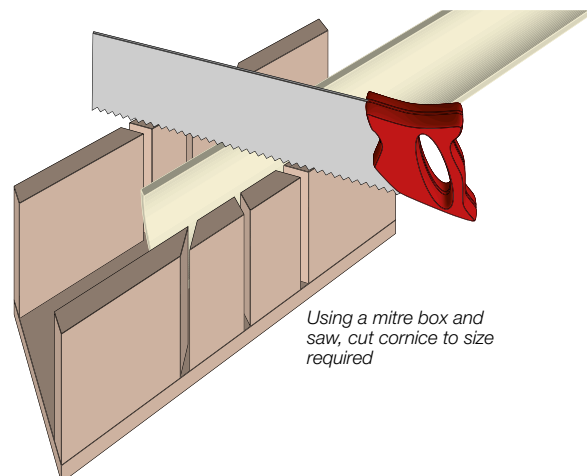
### Install Cornice

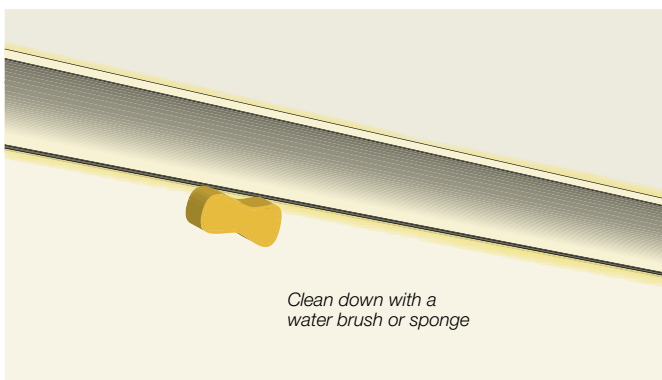
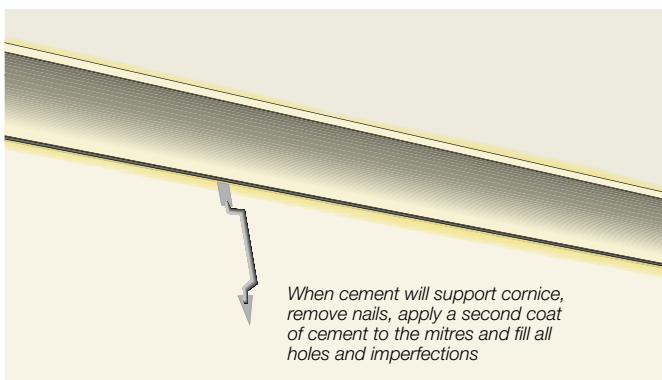
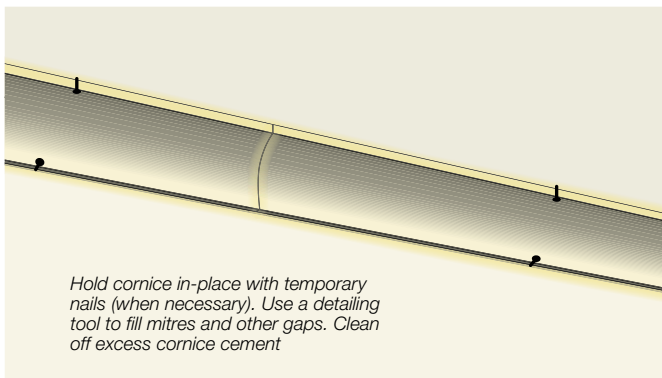
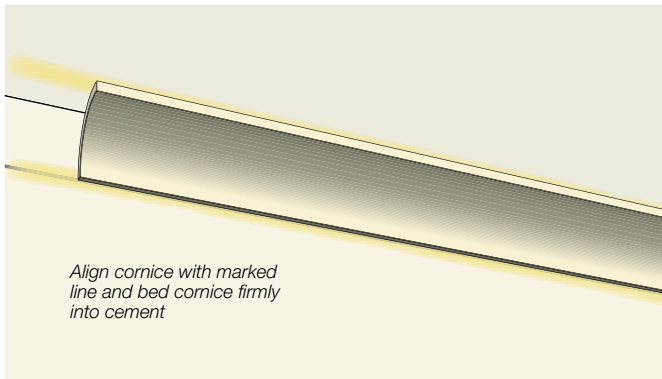
- Position the cornice accurately to the marked lines. Press the cornice firmly into the cement, and where necessary hold cornice in position with temporary nails.
- Clean off any surplus cement.
- Straight stop the cornice and fill internal and external mitres.
- Clean off residue with a damp water brush or sponge.
- Allow to set before removing the temporary nails. and fill the holes.

### Finishing

- When cement will support cornice, apply a second coat of cement to the mitres and butt joints, remove nails and fill holes and any imperfections, then brush with a clean water brush or sponge.

Figure 418: Procedure For Preparing And Fixing Cornice





## Decoration

Interior Gyprock plasterboard surfaces may be decorated in any of a variety of finishes including flat, semi-gloss or gloss paint, wallpaper or vinyl, texture or stipple, or tiles.

Tiles are required in waterproof and water resistant areas.

No building material has an absolutely flat surface, and all that can be expected in practice is an appearance of flatness. The effect of glancing light on the appearance of flat surfaces is described in the CSIRO Division of Building Research Report No. L8 (Revised Edition). This report clearly demonstrates that surfaces which seem perfectly flat in diffuse light appear rough and uneven when light strikes nearly parallel to the surface.

### Surface Preparation

All joint stopping must be sanded smooth.

Remove all loose dirt and dust with a soft brush or dry cloth.

Ensure that the joint treatment is thoroughly dry before applying sealer or paint.

### Wallpaper & Vinyl

To enable removal of wallpaper and vinyl without damaging the plasterboard, seal the surface with a pigmented solvent based sealer.

### Paint Finishes

Select a proprietary paint system and apply all paints strictly in accordance with the respective manufacturer's instructions.

Roll coated paints generally have a greater coating thickness and create a similar texture on both the plasterboard and the jointing compounds.

**The use of a preparatory coat over the entire surface is recommended** prior to application of the finish coats due to the differing texture and porosity of uncoated plasterboard and areas which have received joint treatment.

Recommended paint systems typically consist of one coat of a plasterboard sealer followed by two coats of finishing paint.

### Preparatory Coat

The chosen proprietary brand sealer should be formulated to fulfil the following functions:

- Equalise variations in porosity over the entire surface.
- Provide a bonding surface or key for the finishing coats.
- Stop the migration or bleeding of chemicals from the substrate which could affect the performance of the finishing coat.
- Conceal the difference in texture between the paper surface and the joints.

### Important:

- Plasterboard that has been fixed and allowed to stand for



long periods prior to painting may become discoloured due to exposure to light. In this case the plasterboard surface should be sealed with a pigmented solvent-borne sealer before the application of finishing coats.

- In areas of high humidity such as bathrooms, kitchens, laundries and toilets, a paint system that protects the plasterboard and joints from moisture must be used. Refer to paint manufacturer's recommendations.
- When applying the preparatory coat, apply a sufficient thickness to ensure that the surface is completely covered. Do not over-spread the paint.
- To avoid paint lifting over jointed areas, do not overwork or over-roll the paint when applying the preparatory coat.
- Allow the preparatory coat to dry thoroughly. If necessary, lightly sand between coats of paint to remove any nap lift or other surface blemishes.
- In accordance with normal building practice, application of a finish is deemed to be acceptance of the substrate.

### Finishing Coats

Always follow the manufacturer's instructions for application and recoating.

For best results, apply the coatings with a roller. This helps to achieve a full even coat and a light, uniform texture over the entire surface.

Refer to Australian Standard AS2311 – The Painting of Buildings and/or paint manufacturer's recommendations for specific roller nap length for the desired finish.

### Joint Treatment – Wet Areas

It is recommended that a water resistant base coat be used at sheet joints in areas that are required to be waterproof or water resistant. Set all joints with Gyprock Wet Area Base Coat or Ultra-Base MR 60 and paper tape. When the tape coat has dried, apply a second coat of the same compound. Cover all fastener heads with Wet Area Base Coat or Ultra-Base MR 60.

Joints in wet areas that are not tiled and not required to be waterproof or water resistant should be set with Gyprock compounds and tape as detailed in this publication.

### Tiling

Tiles are required in waterproof and water resistant areas.

The tile adhesive must be compatible with the proprietary waterproofing membrane used.

Proprietary tile adhesives that meet the requirements of AS2358 Adhesives for fixing ceramic tiles are recommended.

For best results, spread tile adhesive directly onto the surface to a depth of about 3mm, then rib in a horizontal direction with a notched trowel having approximately 6mm x 6mm notches.

It is important to strictly follow the membrane/sealer and tile

adhesive manufacturer's instructions to ensure that the system will perform satisfactorily and will provide suitable long term performance. Some products require primers before application.

Allowance must be made for movement by leaving a gap of 3mm between tiles in each vertical corner, as shown.

## Maintenance

It is important that Gyprock plasterboard products be kept dry throughout their service lifetime, and must be protected from internal and external moisture. Regular checks of the lining system (at least annually), as well as regular cleaning and re-painting to manufacturer's requirements is recommended to ensure the Gyprock plasterboard continue to perform the function which they were originally intended.

In general, we recommend that Gyprock plasterboard be replaced after being substantially wet (say as a consequence of burst water services or flooding) as if the paper is wet, or if the paper lining is subject to any deterioration, board strength and the holding capacity of fixings may be reduced. When subjected to minor water effect, the plasterboard must be allowed to dry and be inspected for signs of deterioration or warping. If unaffected the plasterboard can be retained.

Gyprock plasterboard affected by smoke or fire damage is recommended to be replaced.

Minor impact damage to Gyprock plasterboard resulting in small holes and cracks must be patched, stopped and finished as originally carried out using CSR plasterboard and accessories. Where the plasterboard has suffered significant impact damage, resulting in large holes, creases along edge of support framing, or cracks the plasterboard should be repaired using standard methods. For fire rated walls repair must be completed in accordance with the assessed methods outlined in the Gyprock Professional Solutions Guide – Repair Of Gyprock® Fire Rated Wall & Ceiling Linings, available by contacting DesignLINK.

In tiled areas any cracks or damaged areas which would allow water ingress into the wall cavity, must be repaired immediately by re-stopping and repainting, or by replacing tiles, pointing or sealants.

Damaged boards are not covered by CSR's product guarantee and should be replaced.

## Health & Safety

Information on any known health risks of our products and how to handle them safely is on their package and/or the documentation accompanying them.

Additional information is listed in the Safety Data Sheet. To obtain a copy, telephone 1300 306 556 or visit [www.gyprock.com.au](http://www.gyprock.com.au).

## Warranty

Gyprock products are designed to achieve optimal performance when part of a CSR integrated system.

CSR Building Products Limited warrants its Australian made Gyprock products to remain free of defects in material and manufacture for the usual lifetime of the product (25 years).

CSR warrants its International Alliance Gyprock products to remain free of defects in material and manufacture for 7 years.

For details on our product warranty, please visit [www.gyprock.com.au](http://www.gyprock.com.au), or contact us on 1300 306 556.

## Contact Details

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CSR Building Products ABN 55 008 631 356



## Gyprock Commercial & Multi-Residential Installation Guide – Class 2–9 Buildings – May 2020

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