

Design and Installation Guide



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Introduction

This Design and Installation Guide provides design information and installation details for the fixing of Formacor plasterboards to walls and ceilings on timber substrates, applications include internal General areas, wet areas and ceilings.

Formacor™ Plasterboard

Formacor has been developed to provide New Zealand builders, contractors and homeowners with dependable plasterboard solutions for everyday residential projects. Built on the belief that confidence starts at the core, Formacor plasterboard products have been engineered to deliver reliable performance, straightforward installation, and quality finishes.

Backed by the combined expertise of CSR and Saint-Gobain, Formacor brings together trusted plasterboard knowledge with products designed to meet the needs of the New Zealand market. With a focus on strength, trust, confidence and quality, Formacor supports building professionals in delivering projects they can stand behind.

The Formacor range includes plasterboard solutions for general internal linings and wet area applications, manufactured to AS/NZS 2588 and designed to provide dependable performance across a broad range of projects.

This Design and Installation Guide provides information on product selection, system design, handling, storage and installation requirements to help achieve quality outcomes on every build.

Compliant to New Zealand Building Code (NZBC)

Formacor plasterboards comply with the following performance requirements of the NZBC:

- Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4.
- Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years (for wet areas), B2.3.1 (c) 5 years (for general lining) and B2.3.2.
- Clause E3 INTERNAL MOISTURE: Performance E3.3.4 and E3.3.5. (for moisture-resistant boards only).
- Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1.

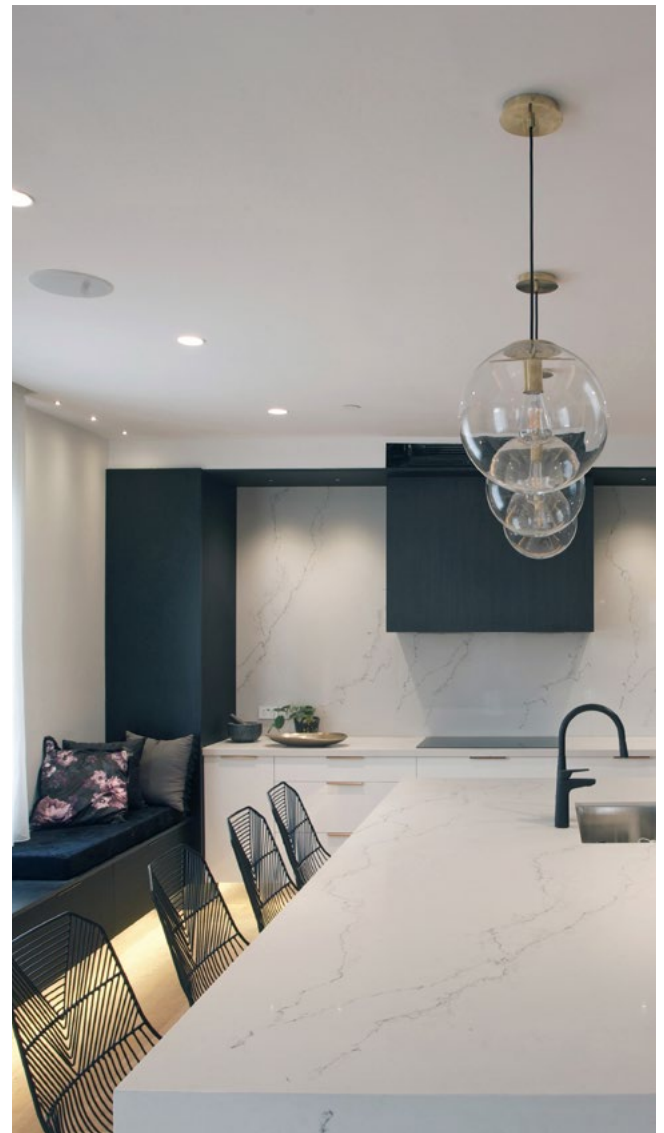
For more information, please refer to the Formacor Product Technical Statement (PTS) at <https://potters.co.nz/product-collection/formacor-plasterboard/>

Applications

Formacor plasterboard can be used as an internal lining board to provide smooth, strong, long-lasting walls and ceilings in all types of residential construction including homes, duplexes, town houses, and medium density residential developments. Its durable surface will accept most types of decorative finishing, including paint, wallpaper, texture compounds and tiles.

Joints between Formacor plasterboard sheets are reinforced and concealed to provide a smooth, durable finish, alternatively covered with a decorative moulding.

Formacor plasterboards must not be used in external applications or garages, as these areas are subjected to different environmental conditions to those in habitable rooms.



Formacor Plasterboard Selection

TABLE 1: Formacor plasterboard Features & Specifications

Formacor Plasterboards	Applications – Walls & Ceilings	THICKNESS (mm)	MASS kg/m ²	Moisture-resistant
	Features			
Formacor Standard	• 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. • Tested and complies with AS/NZS2588 • Available in 2400mm x 1200mm & 2700mm x 1200mm sheets.	10	6.3	
	• A 13mm thick sheet primarily designed for residential ceilings. Long edges are recessed to assist in producing a smooth, even and continuous surface once jointed. • Tested and complies with AS/NZS2588 • Available in 2400mm x 1200mm & 2700mm x 1200mm sheets.	13	9.0	
Formacor Aqua	• A 10mm thick sheet primarily designed for residential walls in wet areas. • Core is treated in manufacture to withstand the effects of moisture and high humidity. • Recessed long edges allow flush jointing to other recessed edge plasterboard types. • Tested and complies with AS/NZS2588 • Available in 2400mm x 1200mm & 2700mm x 1200mm sheets.	10	7.3	✓
	• A 13mm thick sheet primarily designed for residential ceilings in wet areas. • Core is treated in manufacture to withstand the effects of moisture and high humidity. • Recessed long edges allow flush jointing to other recessed edge plasterboard types. • Tested and complies with AS/NZS2588 • Available in 2400mm x 1200mm sheets only.	13	9.4	✓



Referenced Material

The following Standards and handbooks are referenced in this guide.

Manufacturing Standards –

- AS/NZS 2588 – Gypsum plasterboard.

Other referenced Standards and handbooks:

- AS/NZS 1170 series – Structural design actions.
- AS/NZS 2311 – Guide to the painting of buildings.
- AS/NZS 2589 – Gypsum linings – Application and finishing.
- AS/NZS 2785 – Suspended ceilings – design and installation.
- AS/NZS 3000 – Electrical installations.
- AS/NZS 4600 – Cold formed steel structures.
- AS/NZS 4858 – Wet area membranes.
- AS/NZS 5601.1 – Gas installations – General installations.
- AS 3740 Waterproofing of domestic wet areas
- AS 3958 Installation of ceramic and stone tiles
- NZS 3604 Timber-framed building.
- NZS 3603 Timber Structures Standard.
- BRANZ Good Practice Guide: Internal Linings.
- Waterproofing Membrane Association Incorporated (WMAI) Code of Practice for Internal Wet-Area Membrane Systems.

Design & Installation Considerations

Framing Materials

Formacor plasterboard may be fixed to timber framing which conforms to NZS3603 or AS/NZS1170 (series). To achieve an acceptable decorative finish, the walls must not be lined unless the moisture content of the timber framing is less than 18%. AS/NZS 2589 recommends a moisture content of 8-18% where buildings are to be air conditioned or centrally heated.

Wind Loads

All wall, ceiling, floor and roof framing must be designed for the applied loads. Wind pressures occur on interior wall and ceiling linings due to air flow through façade elements as per NZS 3604.

Interior walls and ceilings that are outside the scope of NZS 3604 are treated as Specific Engineering Design and must be designed in accordance with NZS 3603 and AS/NZS1170 (series) by a qualified structural engineer.

Seismic Loads

Seismic actions must be considered for building elements in accordance with the NZBC. Timber frames are to be appropriately designed to accommodate seismic loads. The loads and effects of earthquakes may be determined in accordance with NZS3604. Alternatively, the system must be design in accordance with NZS 3603 and AS/NZS 1170 (series) by a qualified structural engineer.

The calculated seismic forces may be equated to pressures that are to be resisted by the framed walls and ceilings lined with plasterboard, and by the fastening methods that attach them to the framing. The spacing of framing for these walls is dependent on the plasterboard lining span limits. Refer to TABLE 5 and TABLE 6 for maximum framing centres.

Internal Moisture

Formacor plasterboard must not be used where it will be in contact with liquid water or an ambient relative humidity above 90%.

For wet area walls and ceilings subject to intermittent high humidity where plasterboard is specified, any of the moisture-resistant Formacor plasterboards are recommended.

The designer must ensure that moisture control within the building complies with NZBC Clause E3.

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 Formacor plasterboard surfaces be isolated from structural elements, by the use of control joints or other means where:

- A plasterboard/wallboard surface abuts any structural element or dissimilar wall or ceiling assembly.
- The framing or structural support changes within the wall or ceiling.
- At junctions in which wind pressures on the building are likely to result in cracking, often at entrance ways with an adjoining long hallway.
- At all construction/control joints within the building.
- For non-tiled internal walls with plasterboard outer layer, at 12m maximum centres.
- For tiled internal walls, at 4.8m maximum centres.
- At junctions with other building elements.
- At changes of lining material.
- At each storey or rise of studs.

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

Allowance for movement must be made through the frame, lining and any tiles. 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.

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

Refer to 'Fixing Procedures' and 'Installation Details' section for construction information and details.

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 application is required to be installed to AS/NZS5601 Gas Installations, there are requirements stipulated for the protection of surrounding construction. In this case a fire resistant material must be used that meets the specification provided in the code. For residential installations, some acceptable methods for protection include:

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 Formacor plasterboards do not meet the code definition of fire resistant material.

Attaching Fixtures

Lightweight fixtures such as picture frames may be attached to plasterboard walls 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 studs where the stud shall be appropriately designed to accommodate the extra loads refer to FIG 22.

Levels of Finish

Levels of finish are defined in the Australian/New Zealand Standard AS/NZS2589. 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 customer's 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 2.

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".

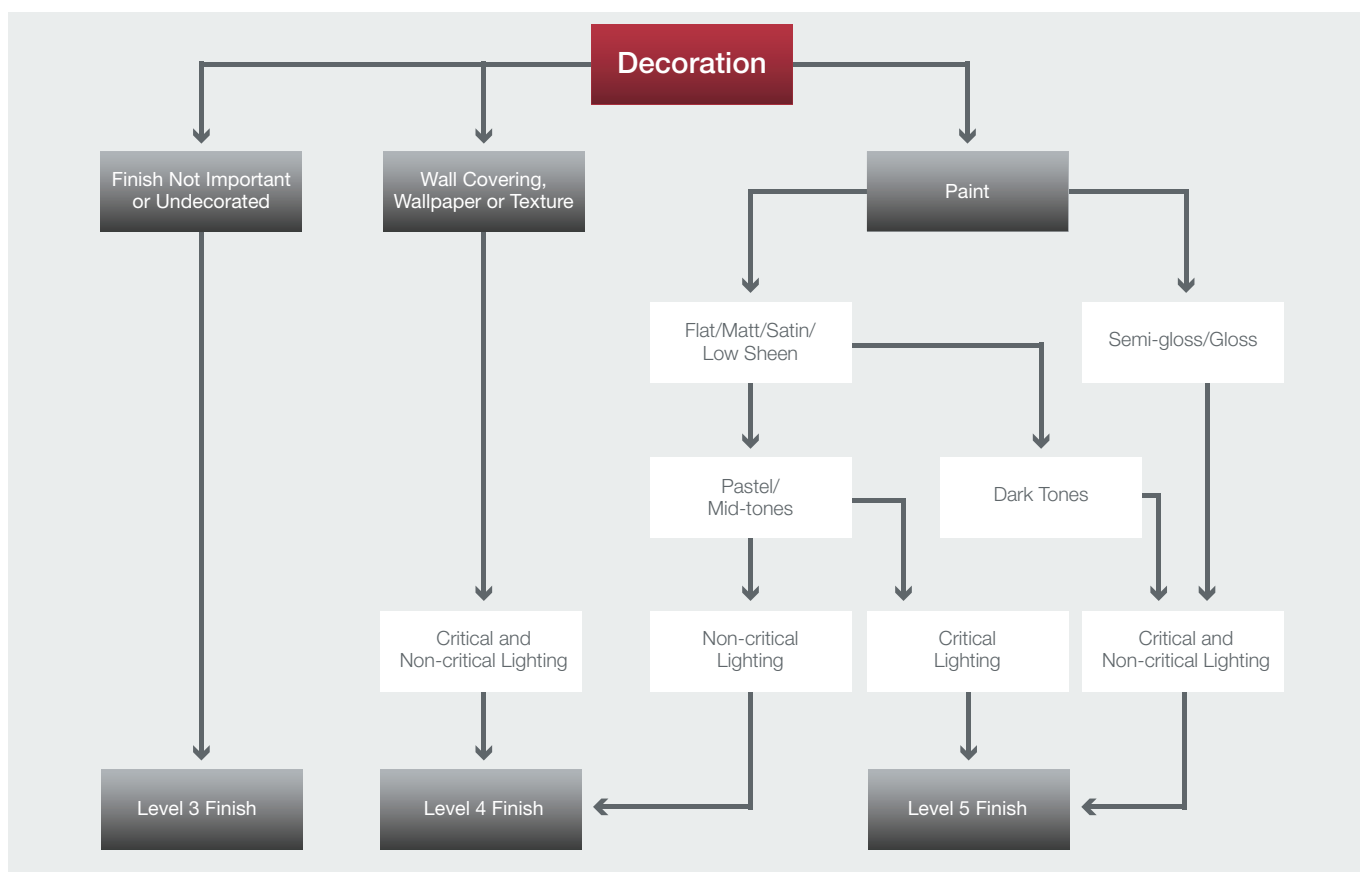
A good method to overcome differences in opinions of quality is to prepare a sample area in a suitable position and for all parties to agree on the finish. The following flow chart will assist in selecting the most appropriate Level of Finish for each area.

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

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.

FIG 1: SELECTING A LEVEL OF FINISH



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.

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.

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, 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.

TABLE 2: Summary of '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 ④	OR	* Fastener Only Fixing ④	Jointing and Finishing (minimum)
		Ceilings		Walls					Butt and Recessed Joints Internal and External Corners
		Butt	Recessed	Butt	Recessed				
3	4	–	–	–	–	✓	OR	✓ ⑤	Tape Coat + Second Coat
4	4	✓	✓ ② ③	✓①	–	✓	OR	✓ ⑤	Tape Coat + Second Coat + Finish Coat
5	3	✓	✓	✓①	–	✓	OR	✓ ⑤	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.
- ④ Tiled and or fire rated installations MUST be all fastener fixed, adhesive is not permitted. All butt-joints to be on-stud.
- ⑤ Not permitted for unseasoned timber.

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

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 effects 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.

FIG 2: WHAT IS GLANCING LIGHT

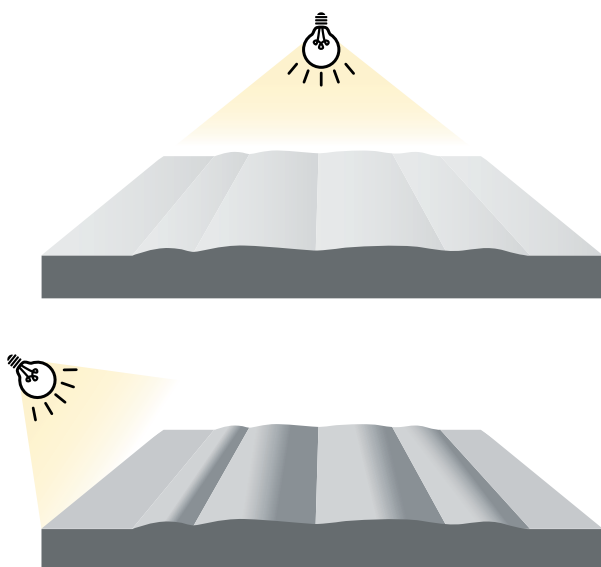
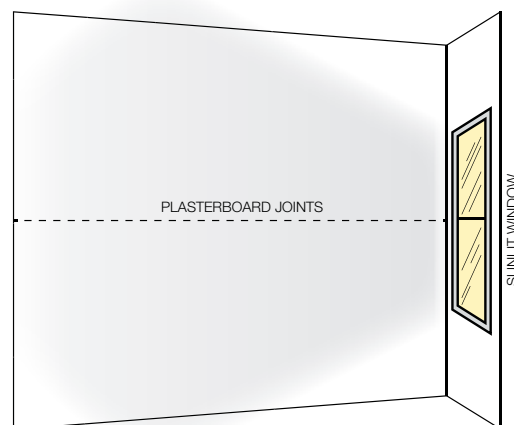


FIG 3: JOINT ORIENTATION



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 highlights imperfections. Clear glazed windows close, or abutted, to perpendicular walls, or acute light sources such as LED wall washers that skim light across a wall or ceiling surface cause maximum visual dissatisfaction.

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:

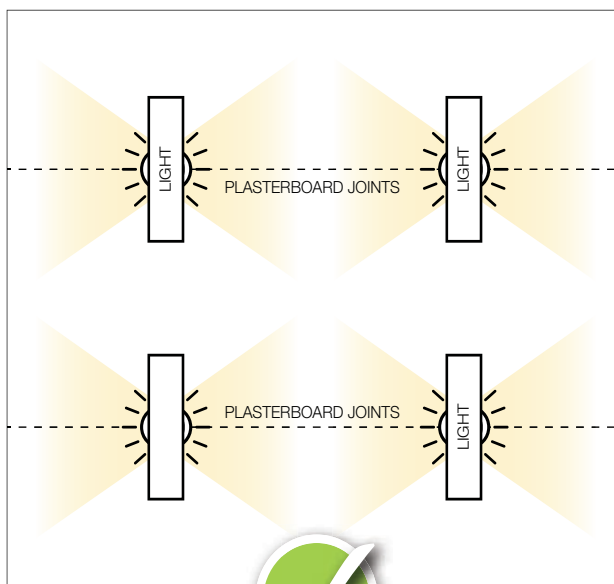
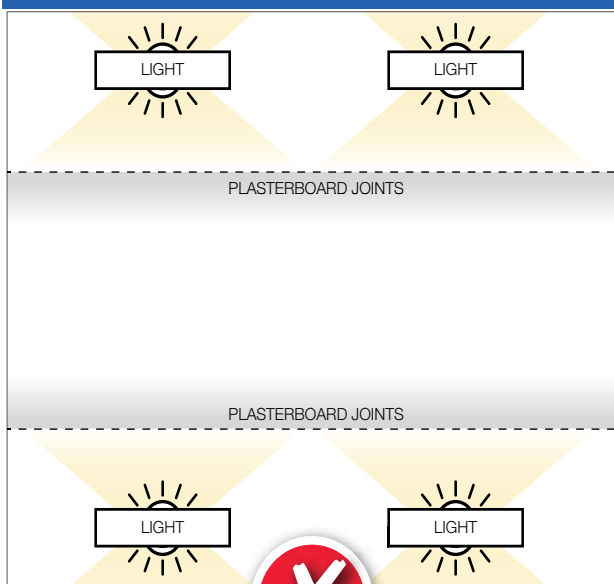
- Unshaded batten holder light fittings.
- Fluorescent lights mounted on the ceiling.
- Wall mounted up lights and downlights.

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. These should not be located close to walls if they cause critical light.
- Consider the use of more lights of lower intensity at regular spacings, ensuring lit areas overlap. This will improve ambience 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.
- Where walls have up-lights, wall washers, or downlights positioned close to the wall; then consider vertical installation of wall linings and aim to centre the light fittings in the middle of the plasterboard sheet.
- 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.

FIG 4: 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 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

Formacor 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.

Sequence of Works

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

1. Framing installation.
2. Wet trades.
3. Roughing in of mechanical and electrical services.
4. Building made weathertight.
5. Installation of insulation in walls.
6. Plasterboard installation on ceilings then walls.
7. Penetrations.
8. Finishing of services.
9. Sealants and junction treatment.
10. Jointing of plasterboard.
11. Installation of insulation in ceilings.
12. Decorative finishing.

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.

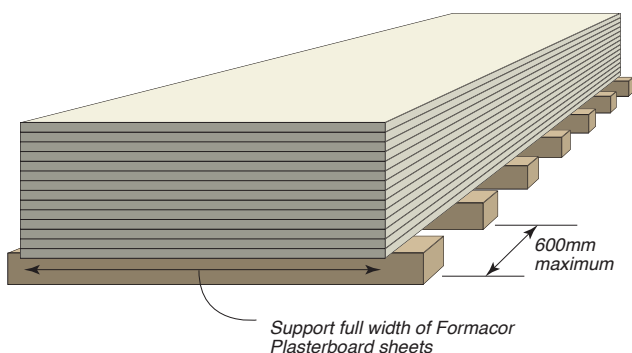
All Formacor plasterboard must be stacked flat, properly supported on a level platform or on support members which extend the full width of the sheets and which are spaced at a maximum of 600mm centres.

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.

FIG 6: STACKING AND SUPPORT OF LINING SHEETS



Plasterboard Cutting & Fixing

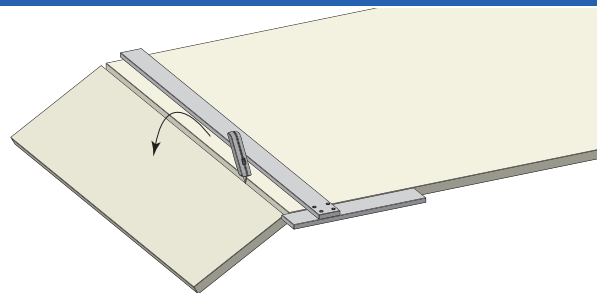
Formacor plasterboard can be cut by scoring the face linerboard with a knife and snapping the plasterboard back away from the scored face.

Always score the front (non-printed) face first. The back linerboard can then be cut from the back towards the front.

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.

FIG 5: PLASTERBOARD CUTTING



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

Penetrations

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.

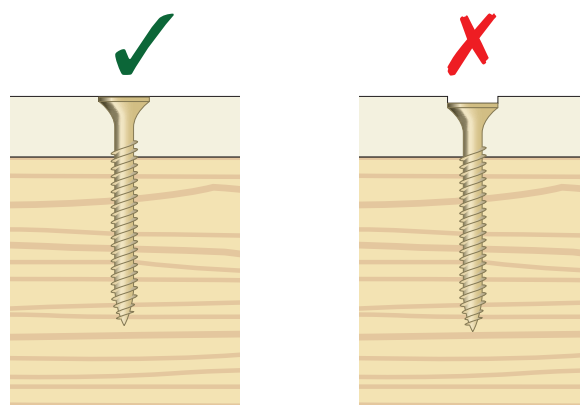
The use of an impact tool such as a hammer is not an acceptable method of producing cut-outs.

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.

Fastener Installation

All 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.

FIG 7: FASTENER DRIVING



General Components

Fixing Systems

The recommended fixing system for all interior applications is fasteners. The fastener fixing system is to be used in all applications and areas, such as in wet areas and tiled areas.

Fasteners

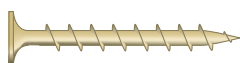
The following fasteners are used with timber framing.

For wet areas, Class 3 or Class 4 fasteners are recommended to be used as appropriate for the corrosion conditions.

The below approved fasteners should be used in these systems:

- **Plasterboard Screws**

#6 Type 'W' for timber framing.



#6 Type 'S' Needle Point (NP) for lightweight steel studs and furring channel up to 0.8mm thickness and hardwood.



TABLE 3: Fixing Plasterboard to Softwood/Hardwood

Thickness	1st Layer
10mm Plasterboard	Type W #6 x 25mm NP Screw (on wall) Type W #6 x 32mm NP Screw (on ceiling)
13mm Plasterboard	Type W #6 x 32mm NP Screw

NOTES:

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

NP = Needle Point Screws

TABLE 4: Fixing Plasterboard to Steel 0.5 – 0.8mm BMT

Thickness	1st Layer
10mm Plasterboard	Type S #6-18 x 25mm NP Screw
13mm Plasterboard	Type S #6-18 x 32mm NP Screw

NOTES:

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

NP = Needle Point Screws

Jointing Compounds and Tapes*

Jointing compounds and jointing tapes must comply with ASTM C475 as specified in AS/NZS 2589.

Corner Beads*

Corner Beads must comply as set out in AS/NZS 2589. Steel Corner Angle (Vertical Corner Flashing) must have a minimum 32 x 32 x 0.55 mm galvanised metal angle.

Sealant*

Sealants must be installed in accordance with the product manufacturer's instruction and applicable standards.

Steel Accessories

It is recommended that Rondo products be used in conjunction with Formacor plasterboard such as: P35 Control Joint, P50, P51 & P52 Stopping Beads, P32 stopping beads, B005 Back Blocking Batten.

While RONDO steel accessories have been referenced in this manual, other components that are equivalent or better can be used as alternative.

Plaster-base Adhesive*

Plaster-base adhesive, such as cornice adhesive, must be used in gluing back-blocking piece and cornices onto Formacor plasterboard.

NOTE: * Products supplied by others.

WALL SYSTEMS INSTALLATION

This section shall be read in conjunction with the Design & Installation Considerations, Level of Finishing, and General Components sections.

Stud Framing

These details are for interior, non-fire rated walls unless noted otherwise. All wall framing must be designed for the applied loads in accordance to NZS 3604 and AS/NZS 1170 (series), and as per the “Design & Installation Considerations” section of this manual.

The spacing of framing for the walls is dependent on the plasterboard lining span limits. Refer to TABLE 5 for maximum framing centres.

- Substrate members which are to support a joint shall have a minimum flat fixing face width of 35mm for timber to enable adequate fixing of the plasterboard. All other substrate members are not to be less than 30mm width.
- All timber framing shall have a minimum structural grade of SG8.
- All substrate members are to be straight and suitable for the application of Formacor plasterboard. Noggings must not protrude to interfere with the linings.
- The deviation in the alignment of the bearing surface(s) shall not exceed the tolerances given in TABLE 2 when measured with a straight edge over a span of 1800mm along individual members or across adjacent members.
- NOTE: A minimum of 90% of all framing shall be in accordance with the appropriate tolerance specified. The remaining 10% (maximum) of framing shall be within +1mm of the allowable deviation.
- Where the alignment of the fixing surface plane falls outside the appropriate tolerance, a suitable levelling system is to be used.
- All openings are to be framed.
- Where door cavity sliders are to be installed, refer to manufacturer for additional framing requirements.

Plasterboard Installation

The following information should be read in conjunction with specific system installation requirements. Also refer to TABLE 2 on page 8 to determine the requirements applicable to the chosen ‘Level of Finish’.

Where interior wall wind pressures are to be considered, the designer should refer to NZS 3604

and AS/NZS1170 (series).

In wet areas, moisture-resistant grade Formacor plasterboards must be used. Refer to the TABLE 1 of this guide for appropriate products, and to specific installation details in the ‘Wet Area Lining Systems’ section of this guide.

Planning & Layout

- The orientation of sheets should be chosen so that any critical light falls along the recessed joints, or to minimise the number of butt joints.
- Where possible it is recommended that full length sheets are used to minimise butt joints at sheet ends.
- The lower edge of wall sheets is to be kept 6-10mm above the finished floor level.
- Sheet 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 FIG 8.
- Noggings are not required behind recessed edge joints in horizontal sheet applications. Noggings should be relocated or trimmed to suit back blocking requirements.
- Where back-blocking of butt joints made between framing is required in accordance with TABLE 2, refer to “Wall Back-Blocking Methods” on page 20 for installation procedures.
- Where butt joints are unavoidable and jointing between framing members is not required, as per TABLE 2, butt joints may be formed on a framing member, provided that the framing member has a bearing face equal to or greater than 35mm width for timber.
- Where butt joints are permitted on framing members, butt sheet ends together centrally over the framing member.
- 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, and in adjacent sheets on opposite sides of the same 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.

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.

Refer to the “Control Joints” on page 19 for appropriate construction details.

Electrical Penetrations

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 Formacor plasterboard is used as a substrate for tiles, the sheets must be moisture resistant plasterboard and fastened with screws only.

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

Please note that this guide does not include advice on selecting the appropriate tile adhesive.

Caulking

Caulking is required in applications such as wet area penetration, where acoustic performance is required.

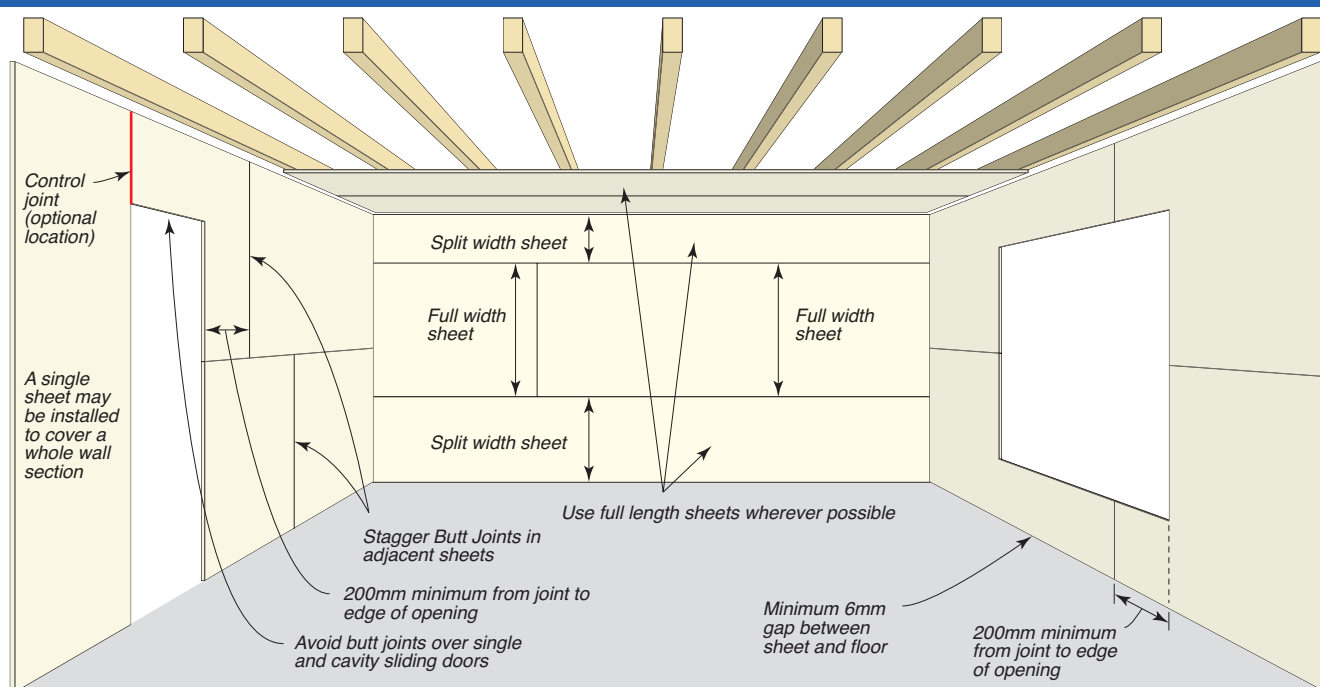
Please note that this guide does not include advice on selecting the appropriate tile caulking materials.

Jointing & Finishing

Sheets are to be fitted together neatly at joints. Gaps up to 3mm wide are permitted and must be filled with a appropriate jointing compounds and jointing tapes must comply with ASTM C475 as specified in AS/NZS 2589.

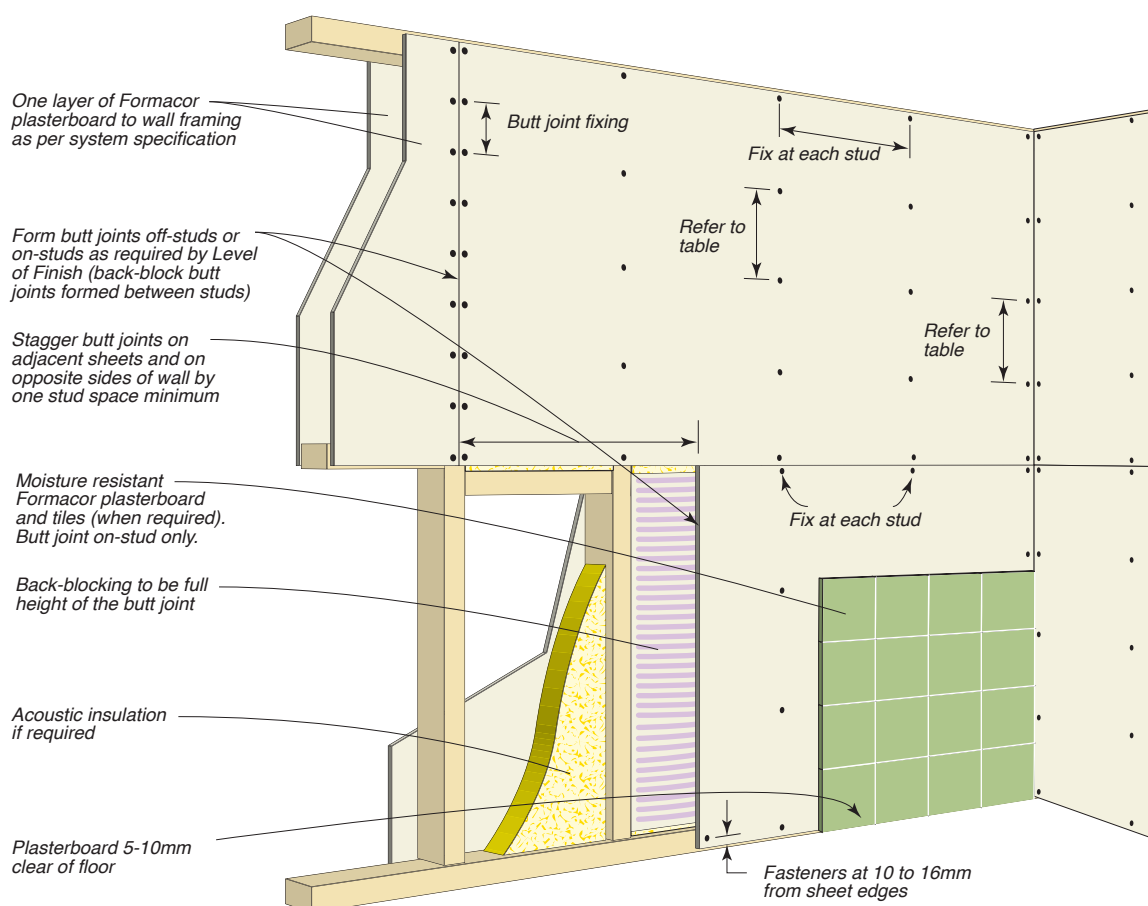
Refer to the ‘Jointing & Finishing’ section of this guide for detailed information.

FIG 8: PLASTERBOARD SHEET AND JOINT LAYOUT



Wall Installation Details

FIG 9: HORIZONTAL PLASTERBOARD FIXING FOR WALLS - NON-TILED OR TILED AREAS



GENERAL INSTALLATION NOTES

- Refer to TABLE 3 for fixing type.
- Refer to TABLE 5 for fixing specification.
- 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.
- For tiled areas, butt joints must be formed on-stud.
- Place edge fasteners at 10 to 16mm from butt joints or 10 to 25mm from recessed edges.

FIXING PROCEDURE - First Side

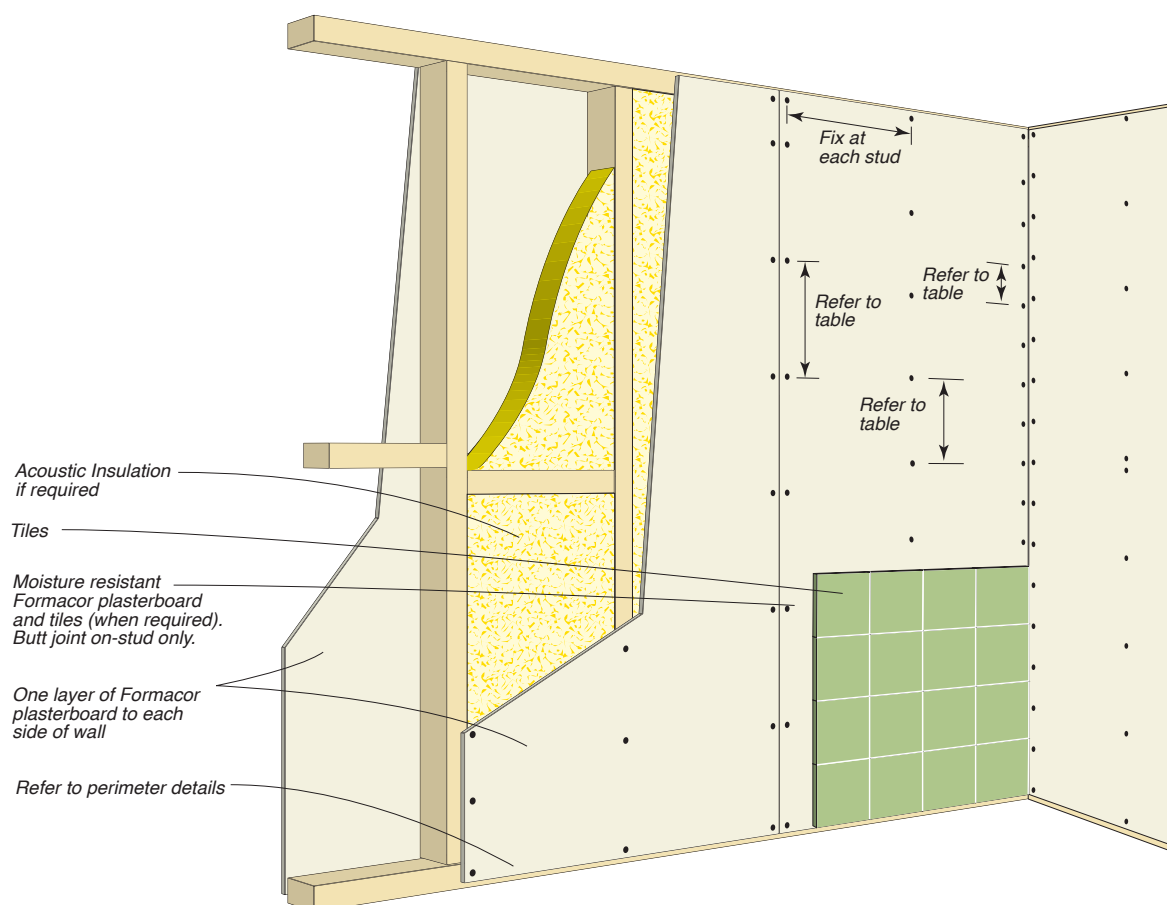
- 1 Apply sheets horizontally leaving a 5-10mm gap between the bottom of the sheet and the floor, and with butt joints off-stud or on-stud in accordance with TABLE 2.
- 2 Press the sheet firmly against the studs and fix to each stud along one recessed edge, as per the fixing specification table, beginning at the centre of the sheet and working towards the ends.

- 3 Where off-stud butt joints are required, form joints within 50mm of the centreline between framing, back-block with adhesive fixed plasterboard. Refer to "Wall Back-Blocking Methods" on page 20.
- 4 Where on-stud butt joints are permitted, centre joints on the studs, press the sheet firmly against the framing and fix as per the fixing specification table.
- 5 Press the sheet firmly against the framing and fix at all corners and around openings as per the fixing specification.
- 6 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.

FIXING PROCEDURE - Second Side

- 1 Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- 2 Cut sheets as necessary so that butt joints in adjacent sheets and on opposite sides of the wall are offset by a minimum of one stud spacing.
- 3 Apply and fix sheets as detailed for the first side.

FIG 10: VERTICAL PLASTERBOARD FIXING FOR WALLS – NON-TILED OR TILED AREAS



GENERAL INSTALLATION NOTES

- Refer to TABLE 3 for fixing type.
- Refer to TABLE 5 for fixing specification .
- 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 a nogging and fixed as per the Fixing Specifications Table.
- Place edge fasteners at 10 to 16mm from sheet edge.

FIXING PROCEDURE – First Side

- 1 Apply sheets, leaving a 10mm max. gap between the bottom of the sheet and the floor, and with recess joints centred on stud faces.
- 2 Press the sheet firmly against the studs and screw fix recessed edges as per the fixing specifications table. Do not fix to intermediate studs at this time.
- 3 Screw fix at butt joints, corners and around openings as per the fixing specifications table.

FIXING PROCEDURE – Second Side

- 1 Ensure all electrical/plumbing/insulation materials have been installed before sheeting second side.
- 2 Cut the first sheet to half width so that recess joints on opposite sides of the wall are located on different studs.
- 3 Screw fix to all studs as per the Fixing Specifications Table.
- 4 Screw fix at butt joints, corners and around openings as per the fixing specifications table.
- 5 Return to the first side and screw fix sheets to intermediate studs as per the Fixing Specifications Table.

TABLE 5: Wall Fixing Specification for Horizontal or Vertical Sheeting – max. 600mm stud spacing

NZS3604 Wind Category	Vertical Fastener Spacing (mm)				Butt joint Fastener Spacing (mm)	
	10 Standard 10 Aqua		13 standard 13 Aqua		Between framing ^a	On Framing
	Non-Tiled Areas	Tiled Areas up to 32kg/m ²	Non-Tiled Areas	Tiled Areas up to 50kg/m ²		
Low	300	150	300	150	n/a	200
Medium						
High						
Very High						
Extra High						

^aWhen back-blocking is required as per TABLE 2, refer to 'wall back-blocking' section on page 20 of this manual



Wall Construction Details

Control Joints

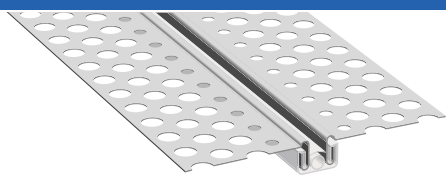
Rondo P35 Control Joint beads are designed to allow expansion in control joints in Formacor plasterboard walls and ceilings.

The control joint is located between the sheets and set over. The filament tape is then removed leaving a clean, well-formed joint.

Door frames extending from floor to ceiling constitute control joints. For doors less than ceiling height, control joints extending from both corners of the frame to ceiling may be used.

Refer to "Control Joints" on page 5 for detailed location requirements.

FIG 11: RONDO P35 CONTROL JOINT BEAD



INSTALLATION OF CONTROL JOINT

- Allow a 15-20mm gap between ends of Formacor plasterboard sheets.
- Locate control joint bead centrally in gap. Fasten flanges and Formacor plasterboard 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.

FIG 12: VERTICAL CONTROL JOINT

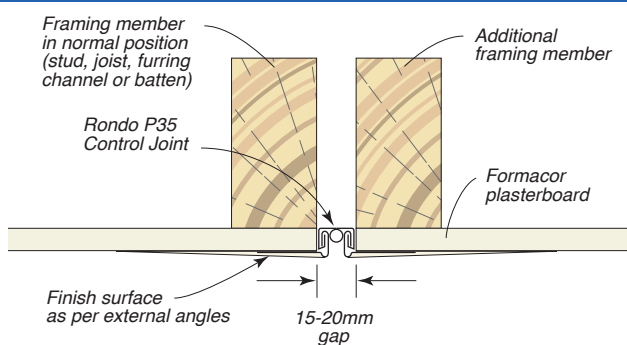


FIG 13: VERTICAL CONTROL JOINT - TILED WALL

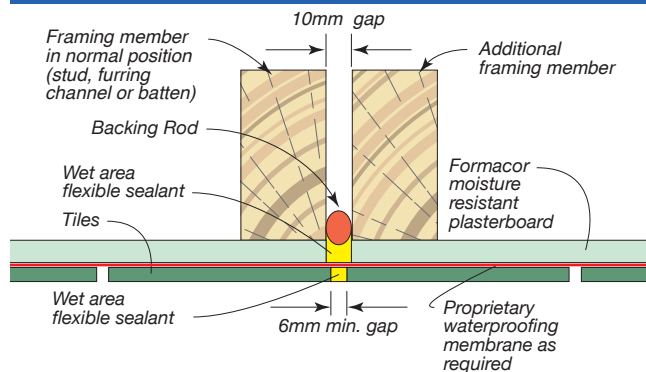


FIG 14: HORIZONTAL CONTROL JOINT WITH CONTROL JOINT BEAD

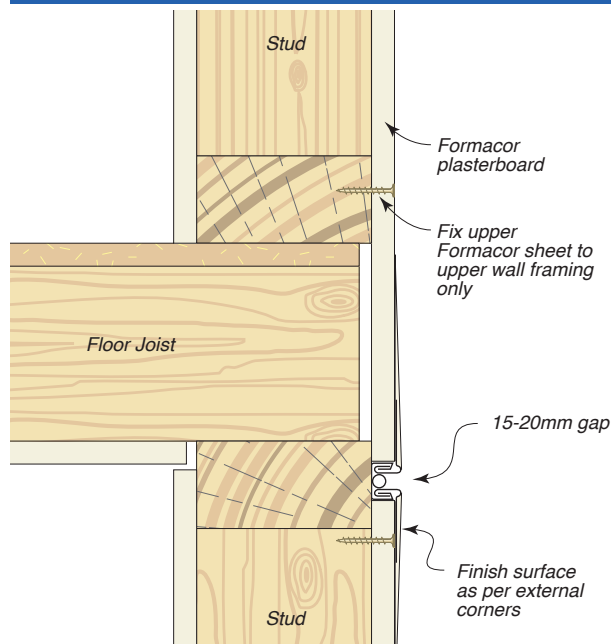
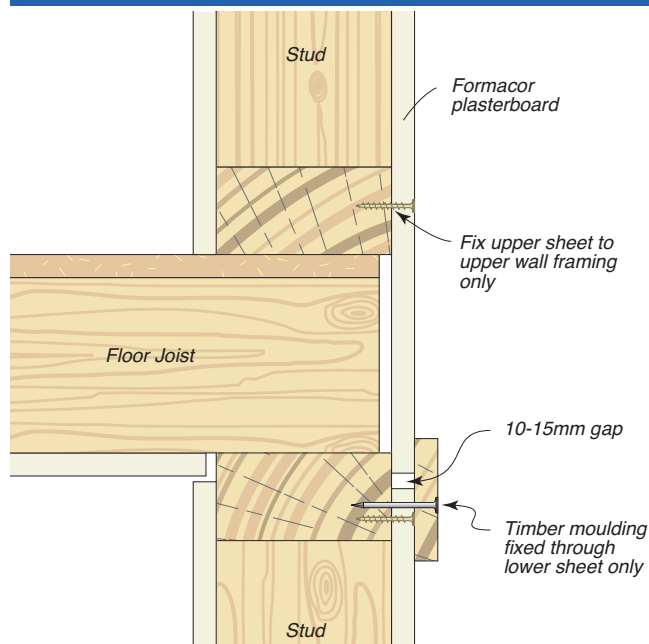


FIG 15: HORIZONTAL CONTROL JOINT WITH TIMBER MOULDING



Wall Back-Blocking Methods

Back-blocking is a reinforcing system where pieces of Formacor plasterboard are laminated to the back of the sheets, behind joints.

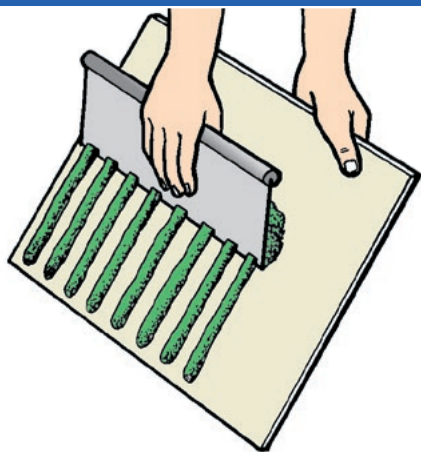
Back-blocking is to be used on all butt joints formed between framing members and on recessed joints where indicated. See requirements in Table 2.

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

All mid-span joints must be positioned within 50mm of the mid-span point between the framing members.

Fix back-blocks with Plaster-based adhesive, e.g. Cornice adhesive, applied with a notched spreader to form beads 6mm x 6mm at approximately 20mm centres over the entire face of the back-block.

FIG 16: ADHESIVE APPLICATION TO BACK-BLOCK



Back-Blocking of Butt Joints on Walls

- Sheet ends should be neatly cut and butted together within 50mm of the centre line between the studs.
- Screw strips of Formacor plasterboard to the sides of the studs to support the back-blocking over the full length of the joint. Position so that the face of the back-block will finish 5mm to 9mm behind the stud face.
- Cut back-blocking to fit neatly between the studs and fix by skew-nailing the edges back to the studs.
- Apply Plaster-based adhesive to back-blocks as described previously.
- Fix Formacor plasterboard wall sheets in place.
- Depress sheet ends at butt joint with battens and packing such as nails to form a 2mm deep depression as illustrated.
- Allow the adhesive to set for a minimum of 24 hours (or refer to the adhesive manufacturer's instruction) before removing the temporary battens. A hollow formation suitable for jointing remains, as illustrated.

FIG 17: BACK-BLOCKING OF BUTT JOINTS ON WALLS

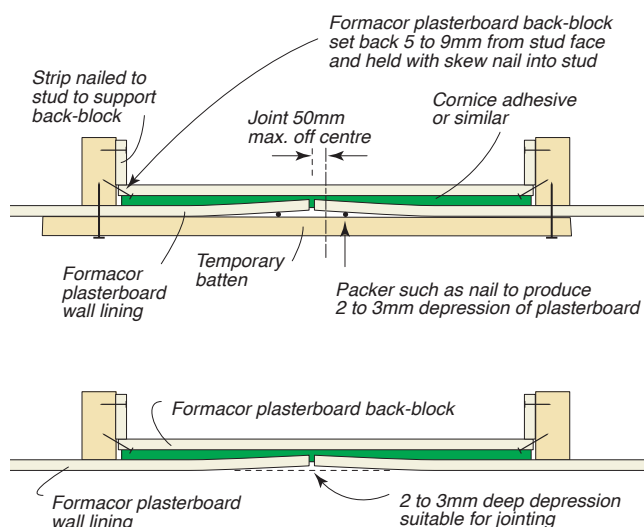
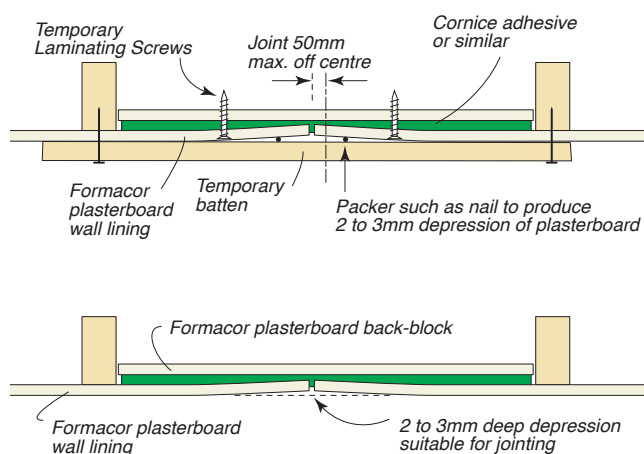


FIG 18: BACK-BLOCKING OF BUTT JOINTS ON WALLS (ALTERNATIVE METHOD)

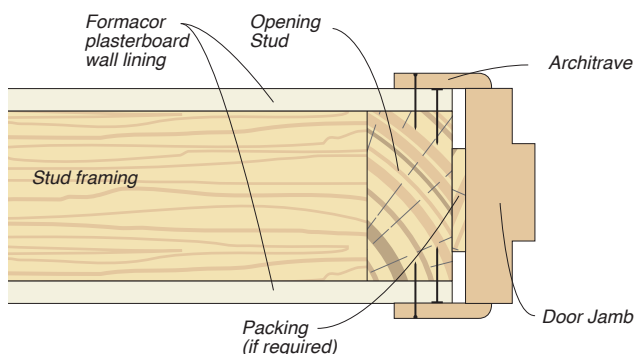


Perimeter Details

Door frames with architrave

- Install Formacor plasterboard to finish flush with the side of the opening stud.
- The appropriate width door jamb is then installed to the side of the opening stud (with packing as required).
- Architraves are then fitted over the junction of the plasterboard and the door jamb by fastening them through to the opening stud.

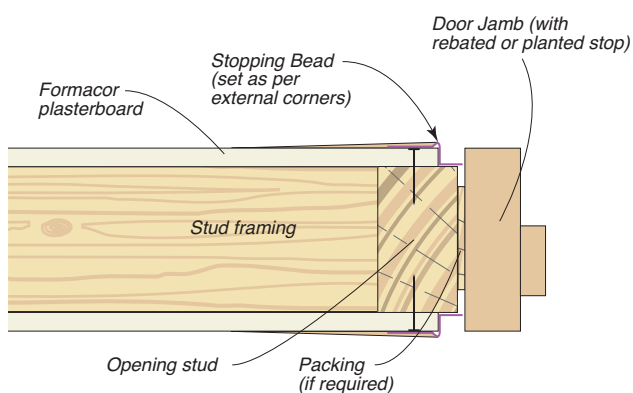
FIG 19: PLASTERBOARD FINISHING AT DOOR JAMB WITH ARCHITRAVE



Door frames with stopping bead

- Install Formacor plasterboard to finish flush with the side of the opening stud.
- The appropriate width door jamb is then installed to the side of the opening stud (with packing as required).
- Trim plasterboard back to allow for Rondo P50 Stopping Bead.
- Fit Stopping Bead and fix at 300mm max. centres.
- Set over bead as for external corners.

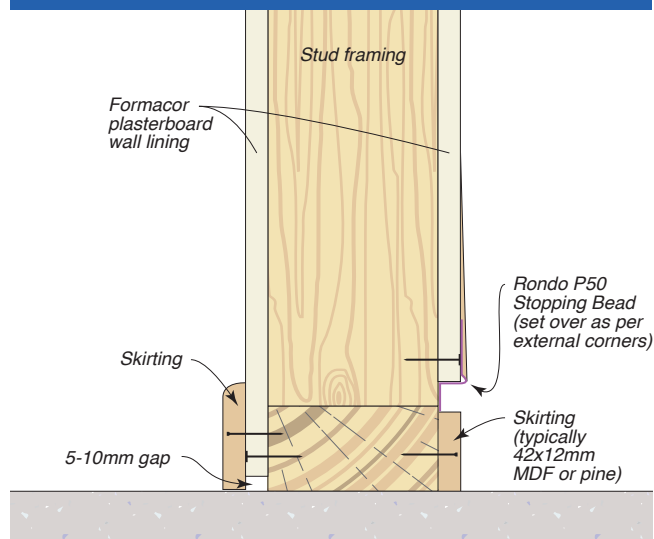
FIG 20: PLASTERBOARD FINISHING AT TIMBER DOOR JAMB WITH RONDO P50 STOPPING BEAD



Skirting board or stopping bead

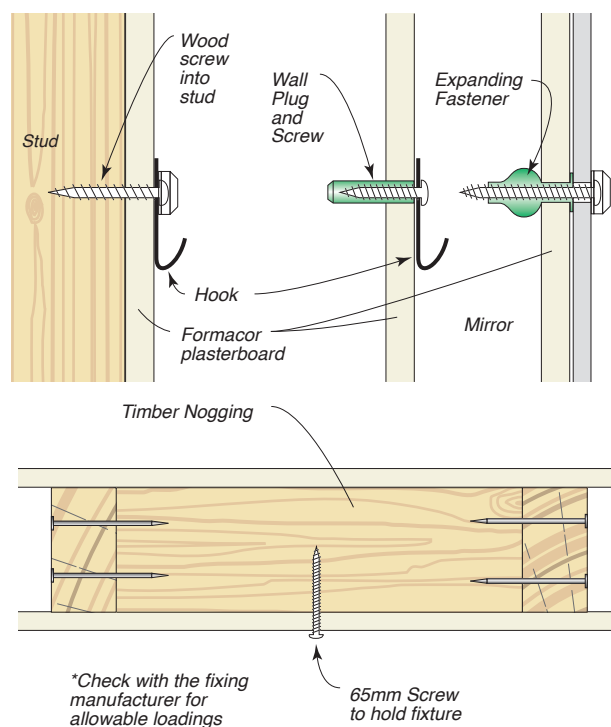
- Install Formacor plasterboard to finish minimum 10mm from the floor.
- Skirting board is then fitted over the plasterboard and fastened through the plasterboard into the frame
- Alternatively a shadow line bead can be used and set over as for external corners.

FIG 21: TYPICAL PLASTERBOARD FINISHING AT SKIRTING



Attaching Fixtures

FIG 22: ATTACHING FIXTURES



WET AREA LINING SYSTEMS

This section shall be read in conjunction with the Design & Installation Considerations, Level of Finishing, and General Components sections.

Applications

Wet areas are defined as areas within a building that are supplied with water. They include bathrooms, showers, laundries, kitchens and toilets, and exclude, bars and other food preparation areas. NZBC E3/AS2 references the Waterproofing Membrane Association Incorporated (WMAI) Code of Practice (CoP) for Internal Wet Area Membrane Systems (IWAM) for selection, design and installation of internal wet-area membrane systems. Refer to the CoP for more information.

In these cases Formacor moisture-resistant board should be used as water-resistant substrates as defined in AS 3740 or water-resistant plasterboard as defined in AS/NZS 2588.

Advantages

The advantages of Formacor moisture-resistant board plasterboard for wet areas include:

- Simple dry wall installation.
- Low in-place cost.
- Smooth, even finish.
- Dimensional stability.
- Low maintenance.
- Allows flush jointing to other Formacor plasterboards.
- 10 or 13mm uniform thickness suits standard door and window frame widths.
- A substrate suitable for both tile and paint finishes.

Wet Area Components

Formacor moisture resistant board

Refer to TABLE 1 of this publication.

Fasteners*

Refer to details in the “General Components” on page 13 of this publication.

Jointing Materials*

Appropriate jointing compound must be used and must comply with ASTM C475 as specified in AS/NZS 2589.

Flexible Sealant*

When flexible sealant is being referenced, it must be installed in accordance with the product manufacture’s instruction and applicable standards.

Waterproof Membrane*

A proprietary impervious barrier compliant with 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*

Flashings including corner and perimeter flashings, must be installed in accordance with the product manufacture’s instruction and applicable standards. In all cases, min. 32 x 32 x 0.55mm galvanised flashing angle shall be used.

NOTE: * Products supplied by others.

Stud Framing

Ensure that all timber 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 and in accordance with the general wall system design on outlined on page 14.

Provide noggings at 25mm above bath, purpose made shower base or sink/tub to support edges of Formacor moisture-resistant board.

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

Plasterboard Installation

Generally, Formacor moisture-resistant board wall sheets are applied horizontally, unless a single sheet covers the whole wall.

Fasteners are to be positioned between 10 and 16mm from sheet edges and at appropriate spacing for the application. Sheets are to be held firmly against frame while fasteners are positioned.

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.

Stagger butt joints between different framing

members. Refer to FIG 9 or FIG 10 for detailed installation information.

Non-tiled Areas

Formacor moisture-resistant 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 Formacor moisture-resistant board is applied as a substrate for tiles, the sheets must be mechanically fastened with screws only. Installation should be to Level 3 Finish.

All tiling must be installed in accordance with the requirements of AS 3958.

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 AS/ISO13007.

Refer to FIG 9 or FIG 10 for detailed installation information.

Design Consideration

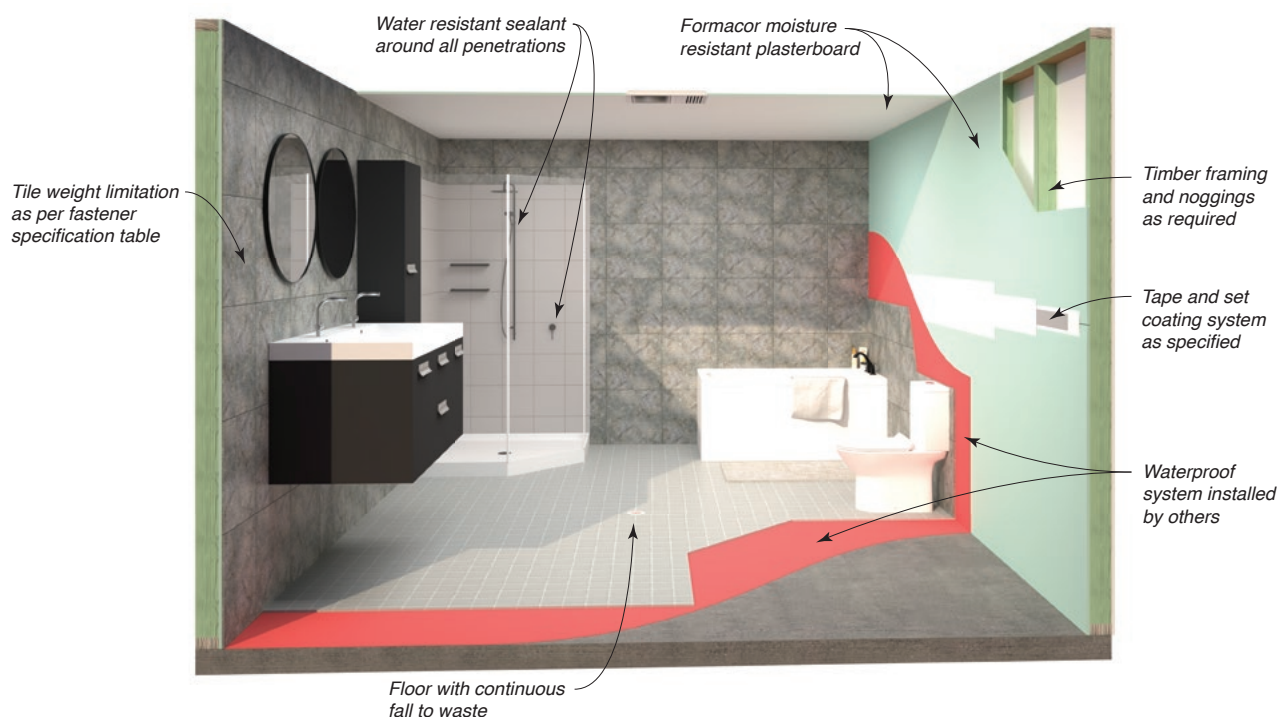
The following section demonstrates some recommended construction details using Formacor moisture-resistant board in wet area.

The construction details presented in this publication are intended as recommendations only. The overall waterproofing performance of the system is subject to the standard of installation workmanship and the suitability of the selected waterproofing membrane system, which are beyond the scope of this publication. Always check with the waterproofing manufacturer of the most relevant construction details and construction methodology.

NZ Building Code Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating, thermal insulation and mechanical ventilation must be provided in kitchens, bathrooms and laundries. This manual does not take this clause into consideration.

Refer to Code of Practice for Internal Wet-area Membrane Systems issued by Waterproofing Membrane Association Incorporated (WMAI) for comprehensive information.

FIG 23: FORMACOR BATHROOM OVERVIEW



Construction Details – Wet area

Note: Always check with the waterproofing manufacturer of the most relevant construction details, construction methodology to suit the waterproofing requirement.

FIG 24: IN SITU FORMED SHOWER RECESS

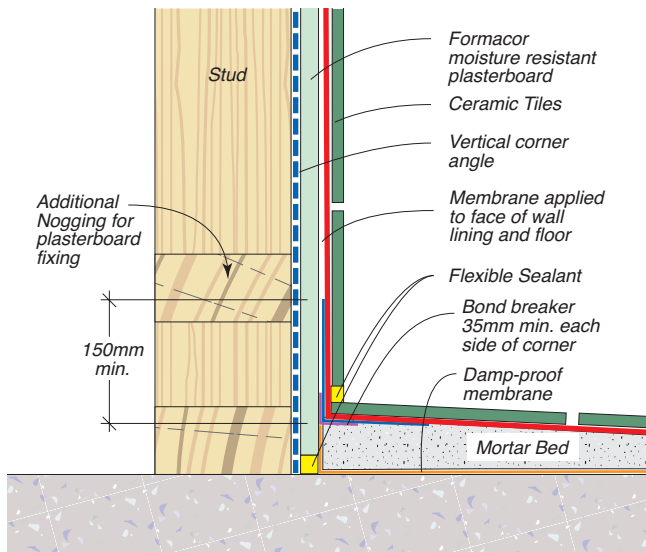


FIG 26: PREFORMED SHOWER TRAY

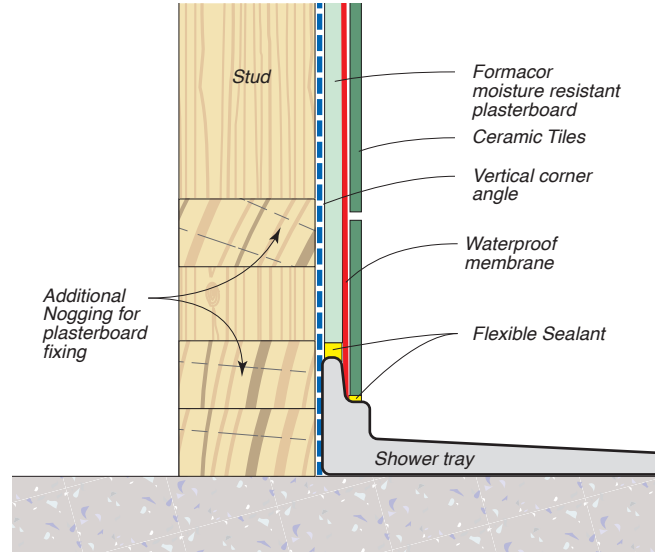


FIG 25: INTERNAL CORNER DETAIL

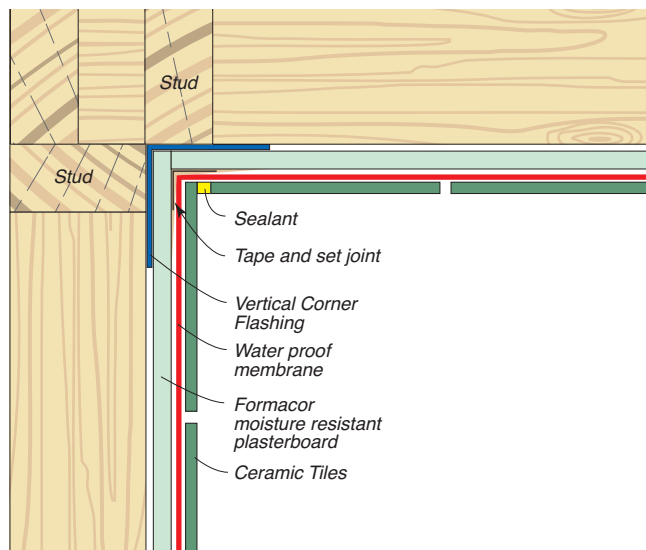


FIG 27: TYPICAL SKIRTING WALL/FLOOR JUNCTION

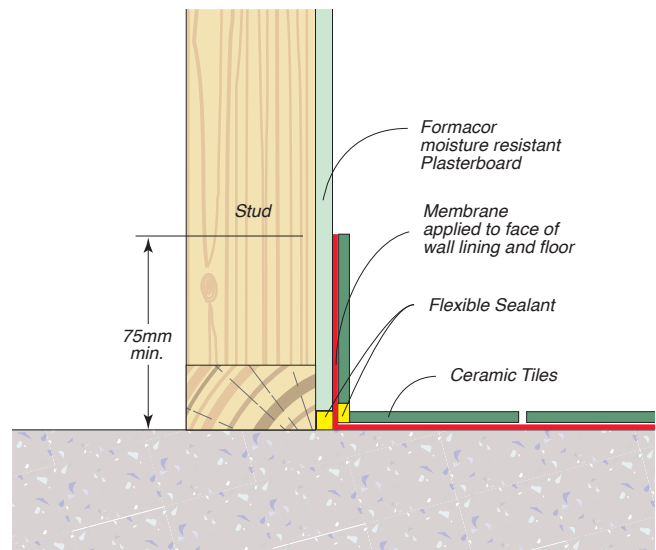


FIG 28: LAUNDRY TUB/SINK INSTALLATION

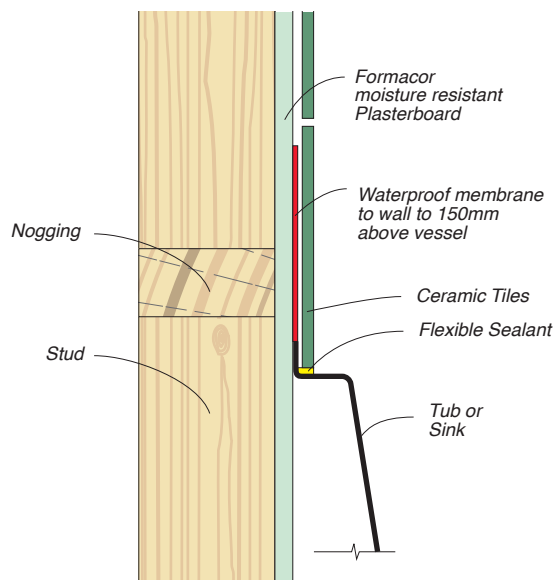


FIG 30: BATH/WALL JUNCTION

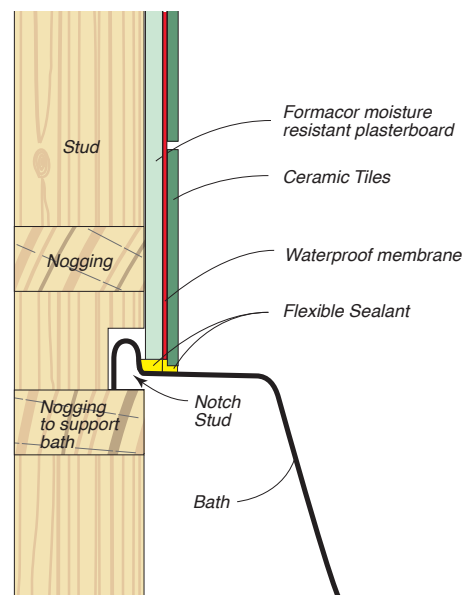


FIG 29: TAP INSTALLATION - ELEVATION

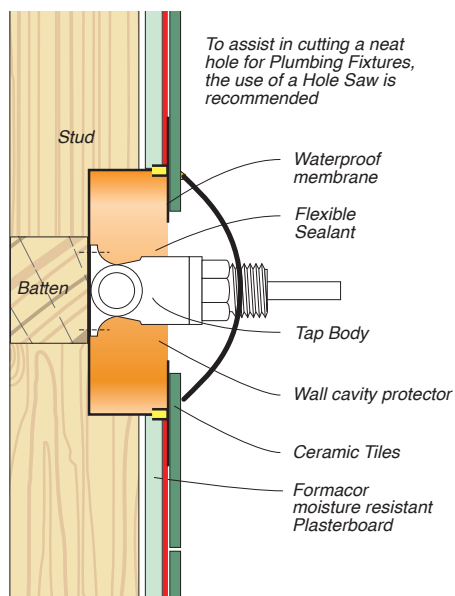
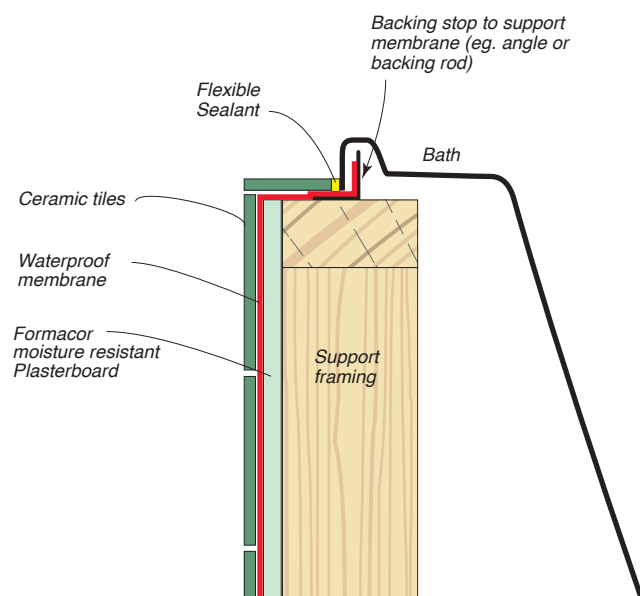


FIG 31: BATH INSTALLATION



FLUSH JOINTED CEILING SYSTEMS

This section shall be read in conjunction with the Design & Installation Considerations, Level of Finishing, and General Components sections.

Introduction

Formacor plasterboard is suitable for use in flush jointed ceiling systems for residential applications.

Plasterboard sheets are fixed to appropriately prepared framing. Plasterboard joints are 'taped and set' to form a smooth 'flush jointed' continuous ceiling suitable for painting.

Applications

Formacor flush jointed ceiling systems are suitable for interior ceiling applications and can be installed under roof or floor framing.

Where a Level of Finish is specified, refer to the Design & Installation section of this manual for additional framing and fixing requirements.

Advantages

- Flush jointing gives a smooth, seamless, easily decorated finish.
- Suitable for use under timber roof and floor structures.
- Surface or flush mounted light fittings can be used.

Design & Installation Considerations

Refer to design, framing, components and installation requirements at the beginning of this guide together with the following specific requirements.

Framing

All ceiling framing must be designed for the applied loads. Wind pressures occur on interior ceilings due to airflow through the façade and lining elements. The spacing of framing for ceilings is dependent on the plasterboard lining span limits. Refer to TABLE 6 for maximum framing centres in various wind categories, and TABLE 3 for fastening details. Ceiling linings may be fixed directly to primary timber framing, or to secondary members such as battens.

Timber members to which plasterboard will be fixed must comply with NZS 3604 and shall have a minimum structural grade of SG8. Timber framing for direct fixing of linings shall have a minimum flat fixing face width of 35mm.

Trimmers are to be provided in the part of the ceiling framing system where primary support members change direction within a room.

Ceiling Components

Formacor plasterboard

Please refer to the full range of Formacor plasterboards in the introduction section of this guide, TABLE 1 on page 4.

Framing & Fixing Components

Please refer to "General Components" on page 13 and additional information in this section.

For wet areas, Class 3 or Class 4 fasteners must be used. To guarantee performance, only recommended fasteners should be used with Formacor plasterboard.

Control Joints

The continuity of lining sheets and support framework should be broken at control joints.

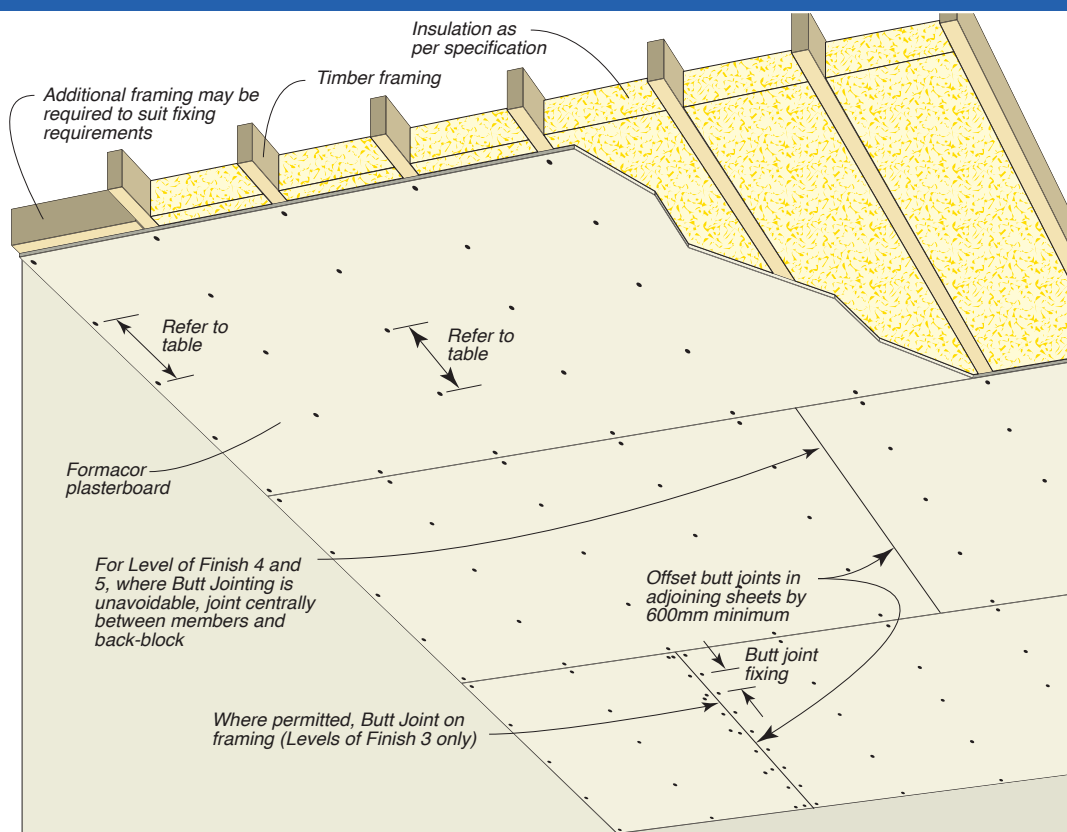
Control joints may be positioned to intersect light fixtures, heating vents and air diffusers. Control joints are to be installed:

- 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 "Construction Details" for appropriate installation methods.

Ceiling Installation Details

FIG 32: FORMACOR PLASTERBOARD INSTALLATION DIRECT FIX TO TIMBER



NOTES ON FIXING

- Refer to TABLE 3 for fastener details.
- Refer to TABLE 6 for fixing specification.
- Suitable for direct fixing to internal timber framing.
- Install sheets with paper bound edges at right angles to joists/framing to which sheets are being fixed.
- Place edge fasteners at 10 to 16mm from sheet edge.

FIXING PROCEDURE

- 1 Apply plasterboard and fasten to each framing member along recessed edges.
- 2 Press the sheet firmly against the framing and fasten the field of the board to each framing member in accordance with TABLE 6.
- 3 Where butt joints are permitted on framing members, fix as per TABLE 6.
- 4 Where butt joints are made between framing, join within 50mm of centreline between framing and back-block joint. Refer to "Back-Blocking of Butt Joints Off Framing" on page 29.
- 5 Back-block recessed joints where required. Refer to "Ceiling Back-Blocking of Recessed Joints" on page 29.
- 6 Offset butt joints in adjoining sheets by 600mm minimum.
- 7 Fasten around openings and ends of sheets as per the fixing specification table.

Construction Details

TABLE 6: Direct Fixing for Ceiling Plasterboard on Timber- Including an insulation load of 6kg/m² max

NZS3604 Wind Category	Vertical Fastener Spacing (mm) ^b		Fastener Spacing at Butt joint (mm)	
	10 Standard 10 Aqua	13 standard 13 Aqua	Between framing ^a	On Framing
Low	300	300	n/a	200
Medium	300	300	n/a	200
High	300	300	n/a	200
Very High	300	300	n/a	200
Extra High	300	300	n/a	200

up to 600mm batten spacing

up to 400mm battten Spacing

^aBack-blocking is required to achieve Level 4 and Level 5 finishes. Refer to ‘ceiling back-blocking’ section on page 29 of this manual.
^bIt is recommended that 13 mm Formacor plasterboard be used for ceiling applications to achieve optimal performance.
 Fastener centres provided in this table considered earthquake design actions to Section 8 of NZS1170.5 with a max vertical distance from ground to ceiling of 12m.

Perimeter Details

FIG 33: CORNICE PERIMETER DETAIL

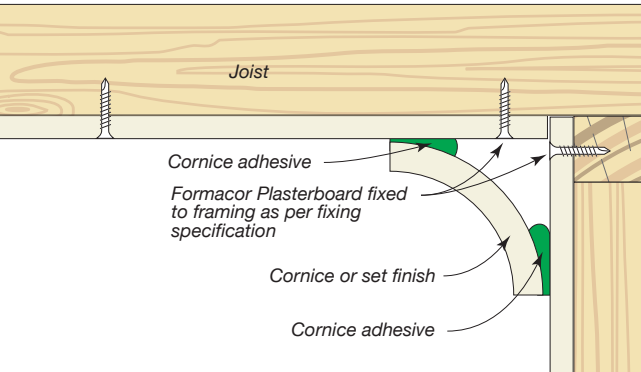


FIG 35: SHADOWLINE PERIMETER DETAIL

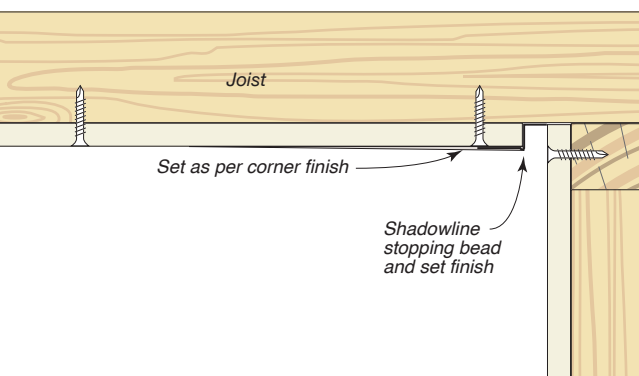


FIG 34: CORNICE PERIMETER DETAIL

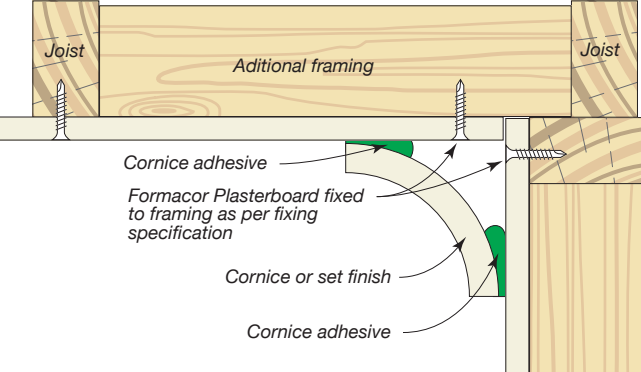
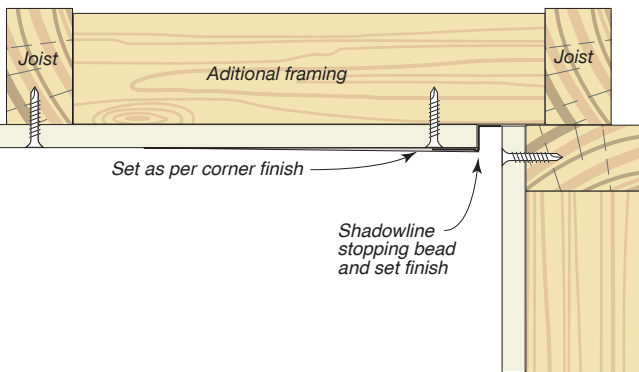


FIG 36: SHADOWLINE PERIMETER DETAIL

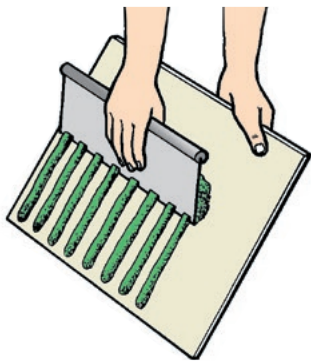


Ceiling Back-Blocking of Recessed Joints

In single layer systems, back-blocking of 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.

Install back-blocking in accordance with the following specifications and refer to the "Levels of Finish".

- Cut back-blocks of at least 200mm width and to length to fit within 30mm of adjoining framing members.
- Fix back-blocks with Plaster-based adhesive, e.g. cornice adhesive, applied with a notched spreader to form beads 6mm x 6mm at approximately 20mm centres over the entire face of the back-block.
- Apply Formacor 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.

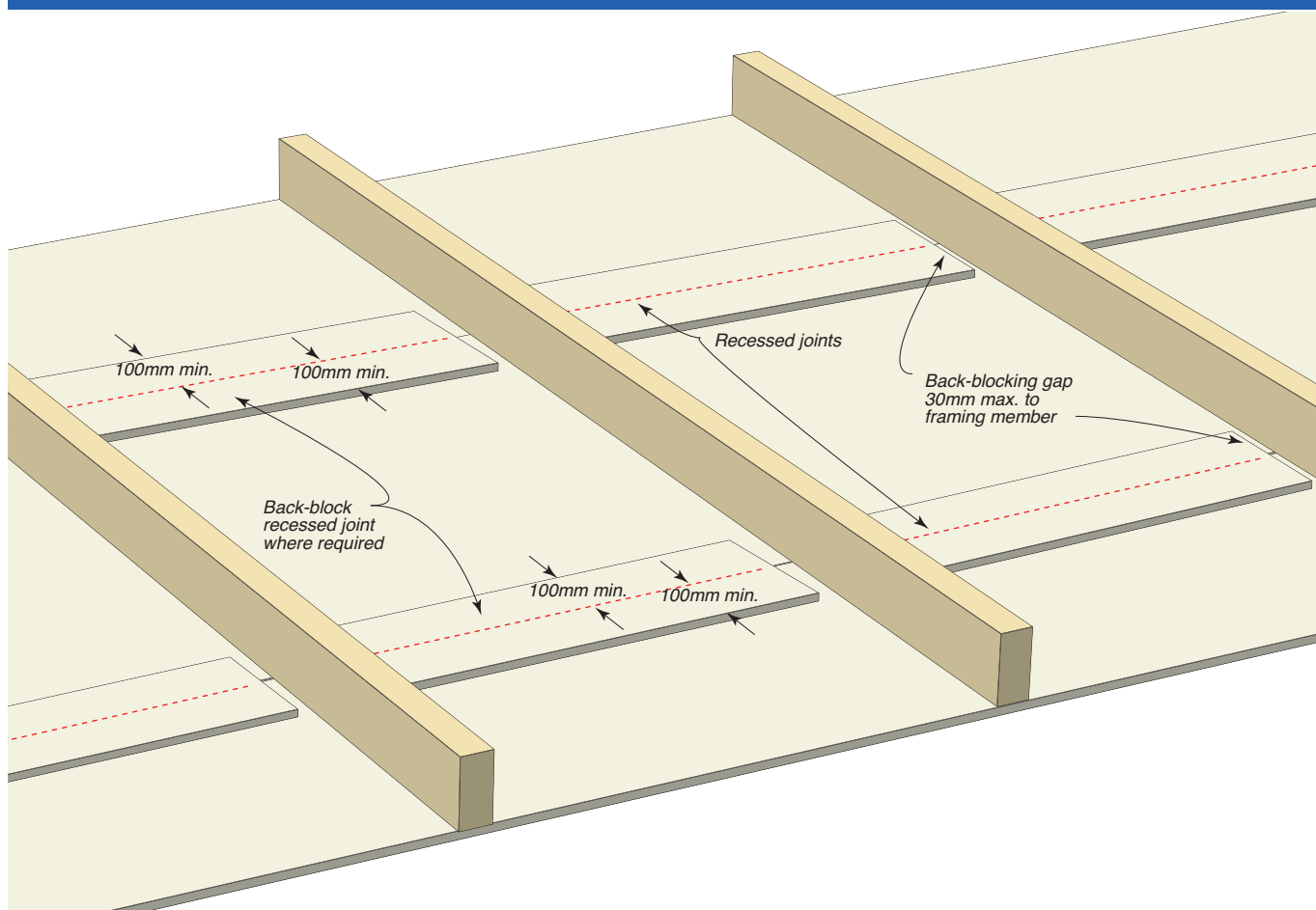
Back-Blocking of Butt Joints Off Framing

Wherever possible, butt jointing of sheets on ceilings should be avoided.

In single layer systems, back-blocking of butt joints is required in all Level 4 and Level 5 Finishes. In these cases, butt joints are to be formed within 50mm of the centreline between framing members, back-blocked and depressed, forming a recess to allow smooth jointing.

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

FIG 37: BACK-BLOCKING OF RECESSED JOINTS ON CEILINGS



One of the following methods is to be used on all single layer butt joints formed between framing members.

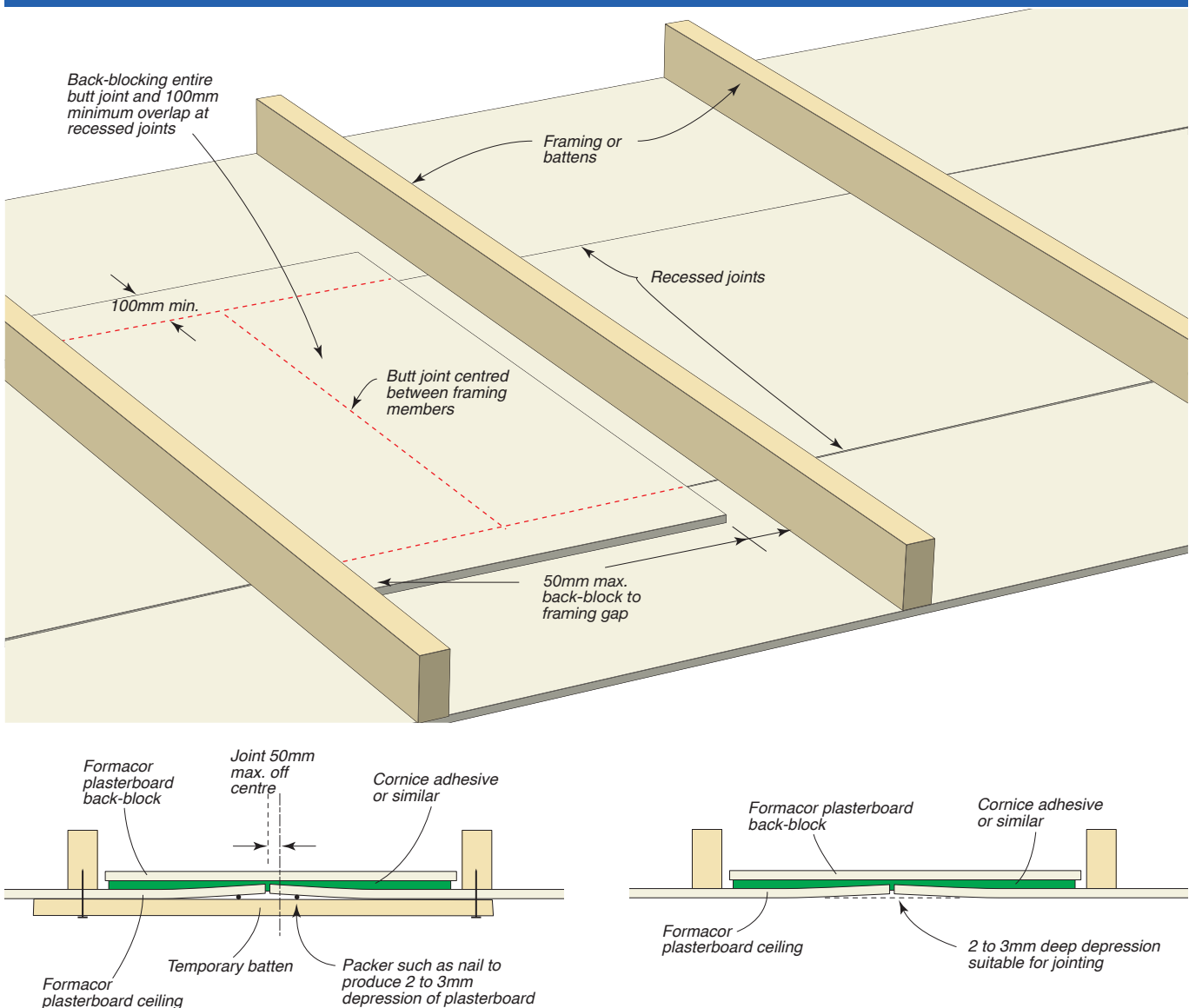
Method 1

Back-blocking is formed using temporary battens screwed to framing across the front of the joint together with pieces of Formacor plasterboard adhesive laminated to the back of the joints. Refer to FIG 38.

- Sheet ends should be neatly cut and butted together within 50mm of the centre line between the studs.
- Fix back-blocks with Plaster-based adhesive, e.g. cornice adhesive, 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.

- Reinforce the butt joint by back-blocking with Formacor 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 Plaster-based adhesive, e.g. cornice adhesive, as described earlier.
- Allow the adhesive to set for a minimum of 24 hours (or refer to the adhesive manufacturer's instruction) before removing the temporary battens. A hollow formation suitable for jointing remains.

FIG 38: BACK-BLOCKING OF RECESSED AND BUTT JOINTS ON CEILINGS

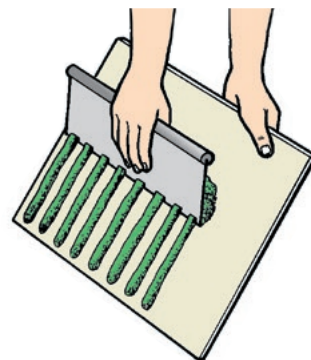


Method 2

Back-blocking is formed using Rondo B005 battens to form the depressed joint, along with pieces of Formacor plasterboard adhesive laminated to the back of the joint. Refer to FIG 39.

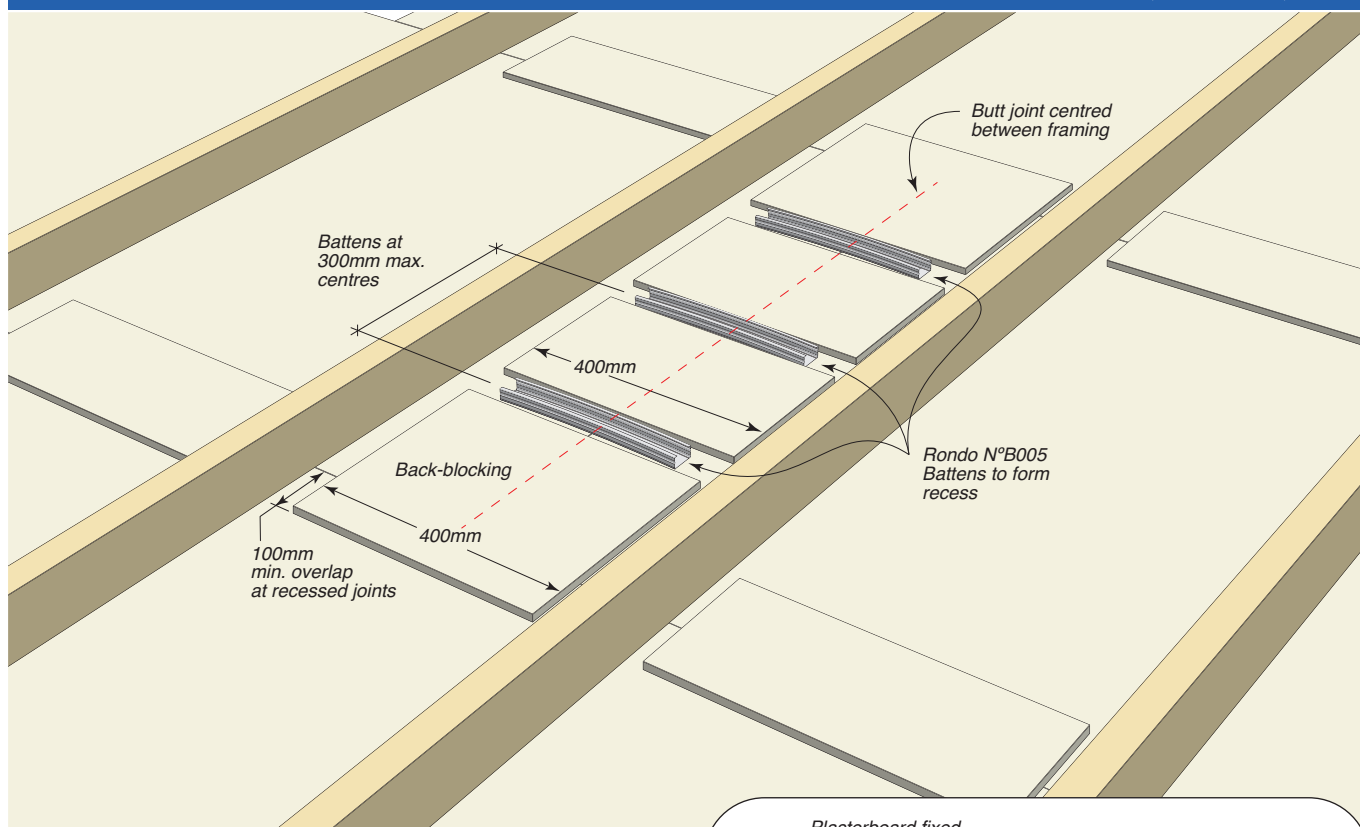
- Install Rondo B005 battens centred over the butt joint and at 300mm maximum from recessed joints and 350mm maximum centres.
- Fix battens with 2 screws each side of the joint to form a depression in the ceiling sheet. Install screws carefully. Collated screw guns may not be suitable for this procedure.
- Cut back-blocks to overlap the recessed joints by 100mm minimum and long enough to fit loosely between the framing members.

- Fix back-blocks with Plaster-based adhesive, e.g. cornice adhesive, applied with a notched spreader to form beads 6mm x 6mm at approximately 20mm centres over the entire face of the back-block.

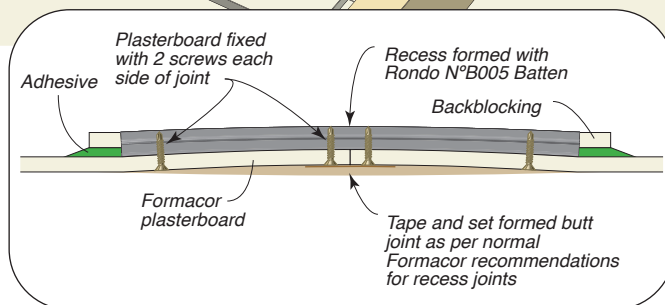


- Reinforce the butt joint with the back-blocking along the full length of the butt joint and overlapping the recessed joints by a minimum 100mm.
- Allow the adhesive to set for a minimum of 24 hours (or refer to the adhesive manufacturer's instruction) before removing the temporary battens. A hollow formation suitable for jointing remains.

FIG 39: BUTT JOINT CONSTRUCTION USING RONDO B005 BATTENS AND BACK-BLOCKING (TOP VIEW)



NOTE: Install screws to battens carefully. Collated screw guns may not be suitable.



JOINTING & FINISHING

Jointing Systems

Jointing and finishing of Formacor plasterboard interior installations is to be carried out in accordance with the requirement 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 accepted level of finish for residential construction as detailed in AS/NZS2589.1, and is also recommended for commercial construction. This requires a three coat system, consisting of:

- tape and tape coat.
- second coat.
- finish (or topping) coat.

Jointing 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. They are recommended for experienced trades people and have typical setting times of 20, 45, 90 or 150 minutes.

Additional coats may be applied over setting type compounds once they have gone hard (set), usually after 40 minutes to two hours. 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.

All compounds can be applied by hand or with mechanical jointing tools.

Jointing Wet Areas

It is recommended that a joint compound suitable for use in wet areas be used at sheet joints in areas that are required to be waterproof or water resistant.

Joints in wet areas that are not tiled and not required to be waterproof or water resistant should be set with compounds and tape as detailed for Level 4 or Level 5 finishes.

Jointing Tape

Tapes are used to provide strength and rigidity in the first coat of a three coat plasterboard jointing process. The tape is bedded in a base coat or all-purpose compound before the second coat and topping coat is applied and sanded, ready for painting. Tapes are also used in conjunction with a patching compound to repair dents, cracks and holes in plasterboard walls, ceilings and cornice.

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. Refer to the product manufacturer for further information.

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.

Jointing with Mechanical Tools

The use of mechanical tools to joint Formacor plasterboard is very popular, when used correctly, these tools can significantly increase productivity by cutting the amount of time taken to finish a job.

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

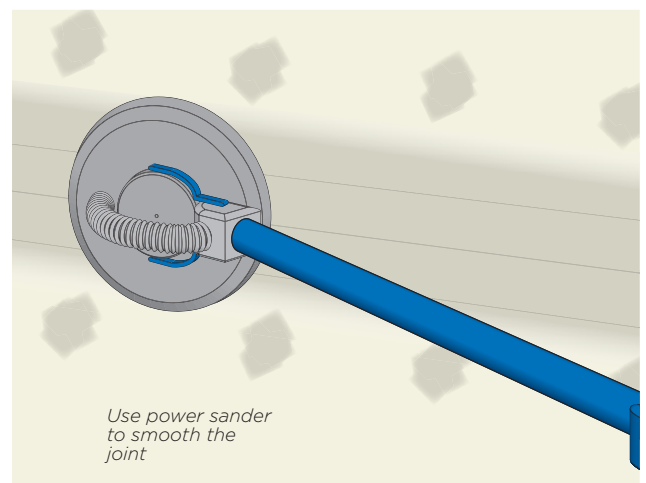
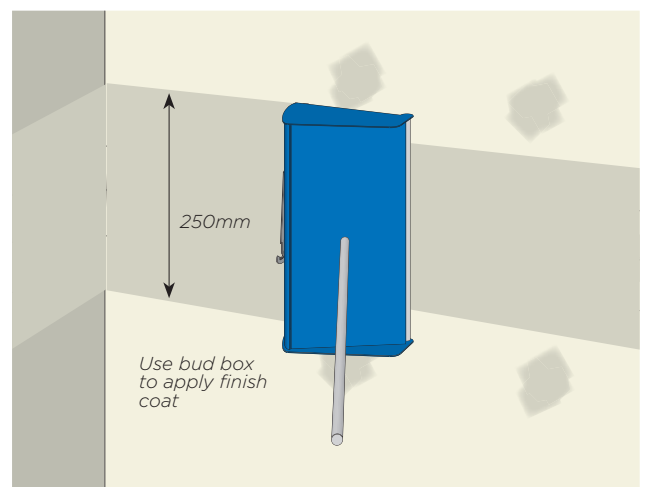
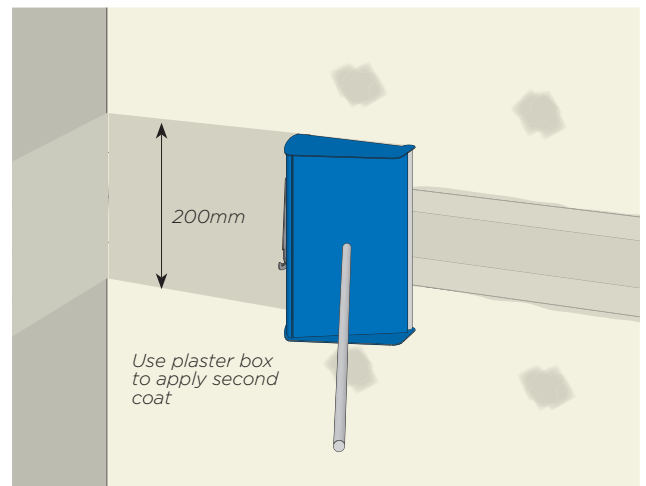
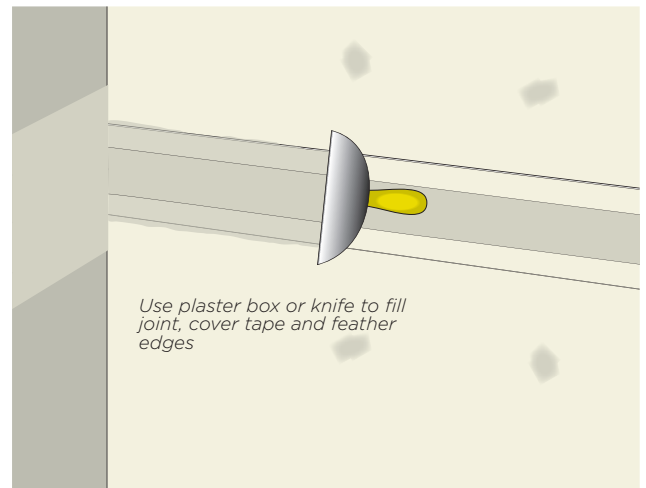
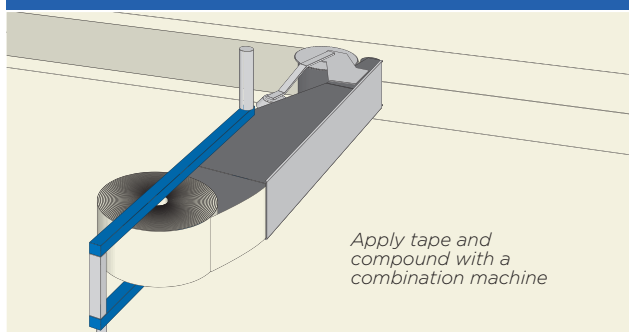
- Using a 250mm plaster box, apply a third coat to the recessed joint.
- Cover fastener heads with a third coat of compound, laid in a different direction, extending beyond the previous coat by about 25mm. Ensure that the edges of the compound are neatly feathered and that there are no trowel edge marks left in the final stopping.
- Allow compound to harden before proceeding.

Sanding

- Use a power sander to smooth the compound.

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.

FIG 40: 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.

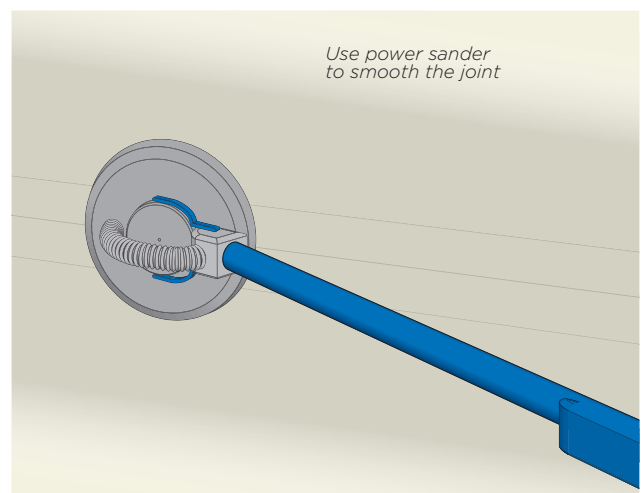
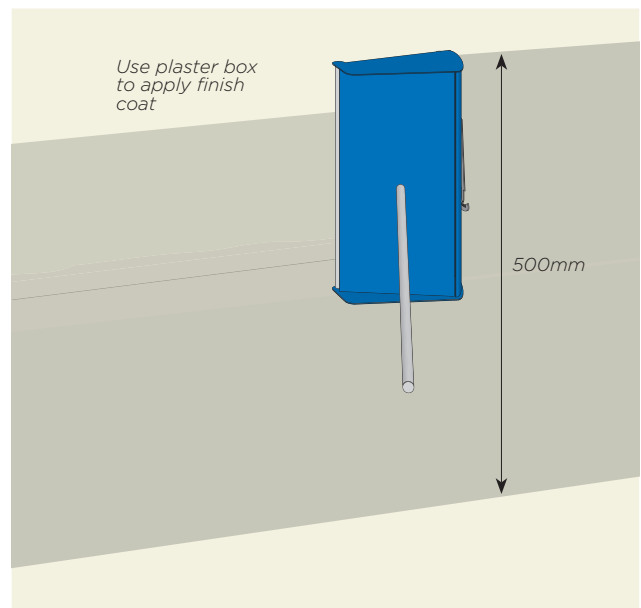
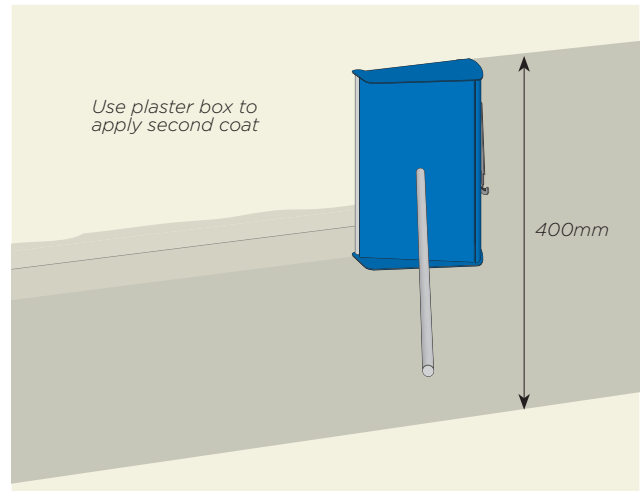
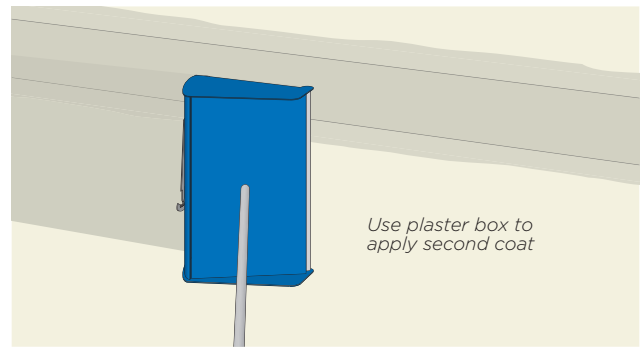
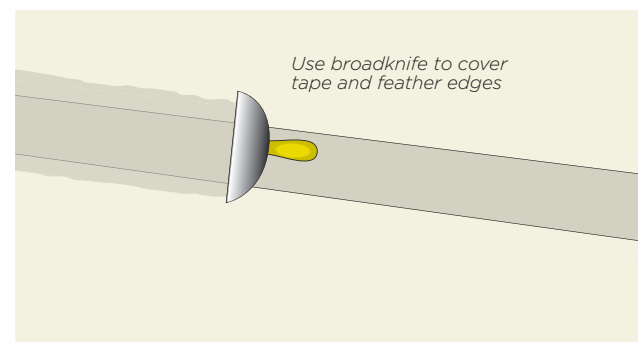
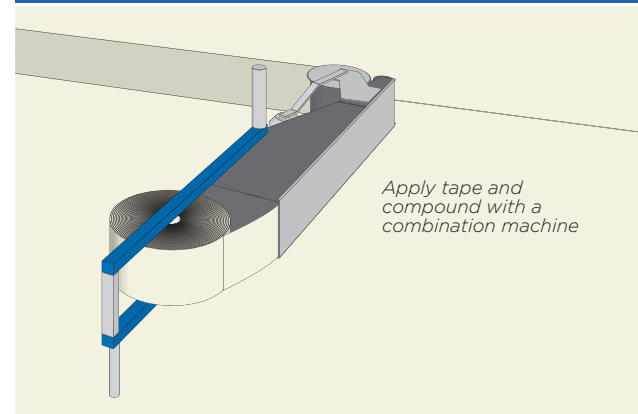
Sanding

- Use a power sander to smooth the compound.

Sanding

- Use a power sander to smooth the compound.

FIG 41: 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

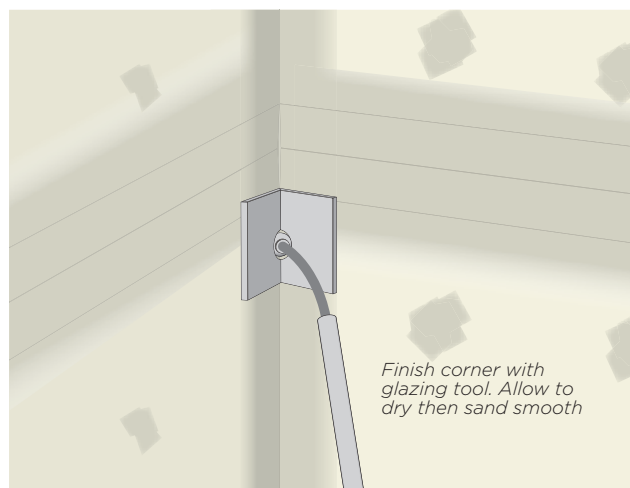
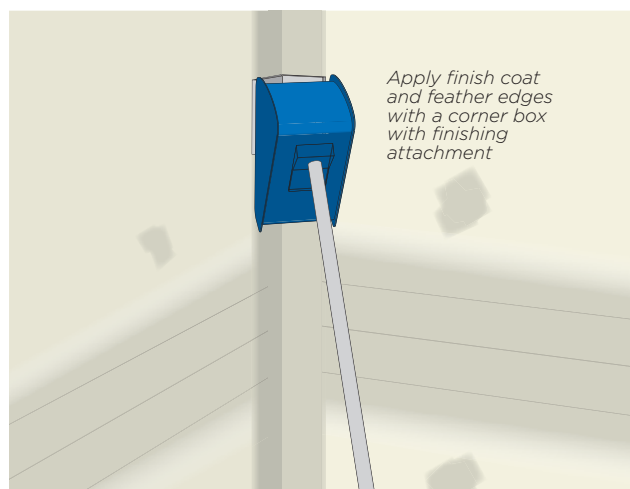
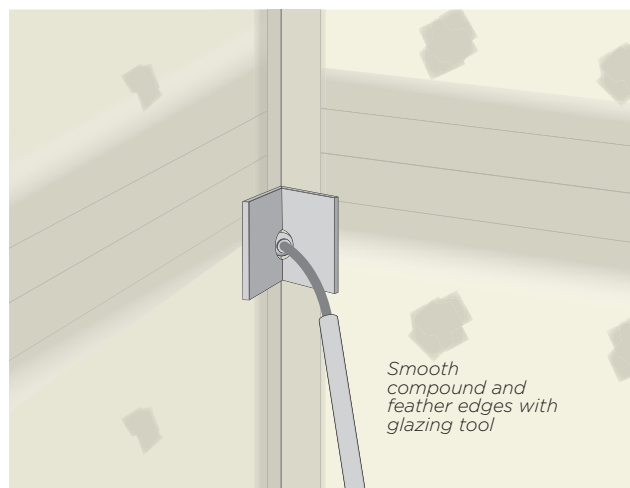
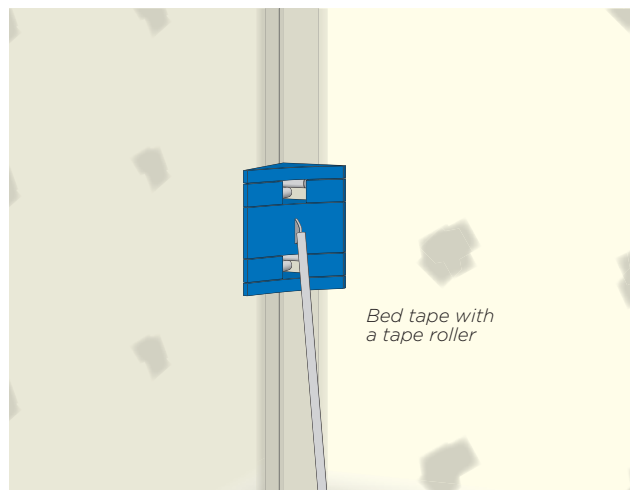
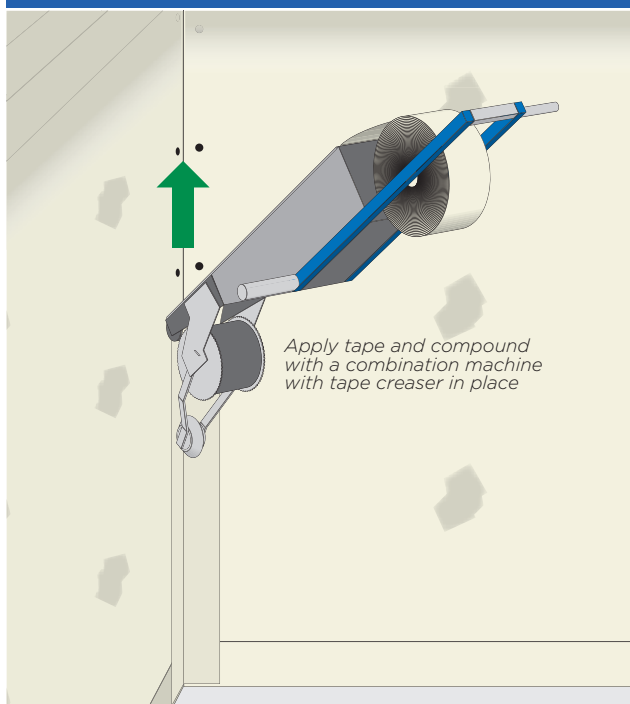
- Using a corner box with finisher attachment or corner glazer, apply a thin coat of finishing compound over the tape coat, ensuring that the edges are well feathered.
- Smooth joint with glazing tool.
- Allow compound to harden before proceeding.

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.

FIG 42: 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.

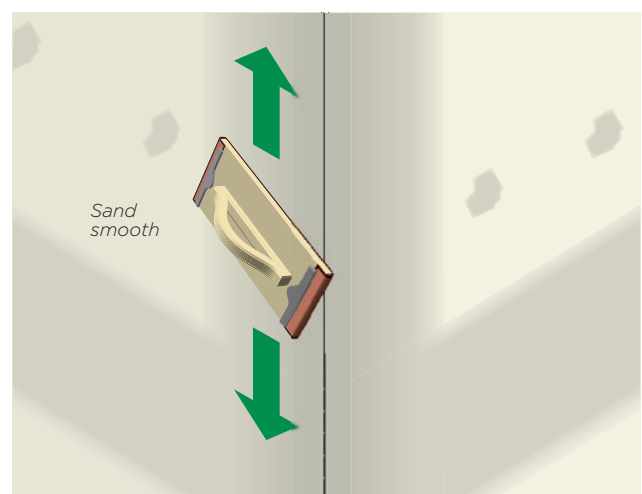
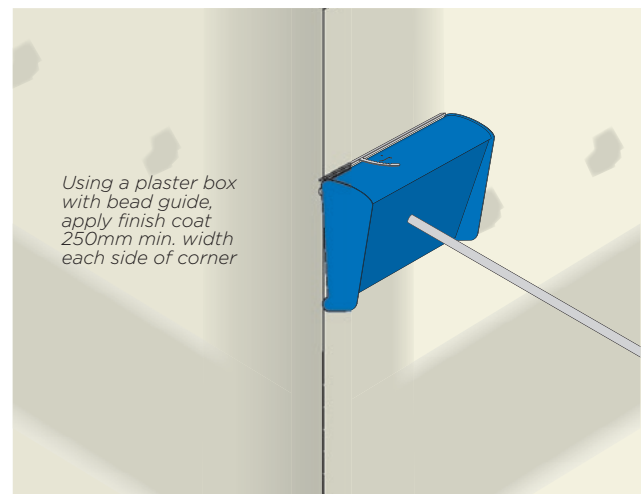
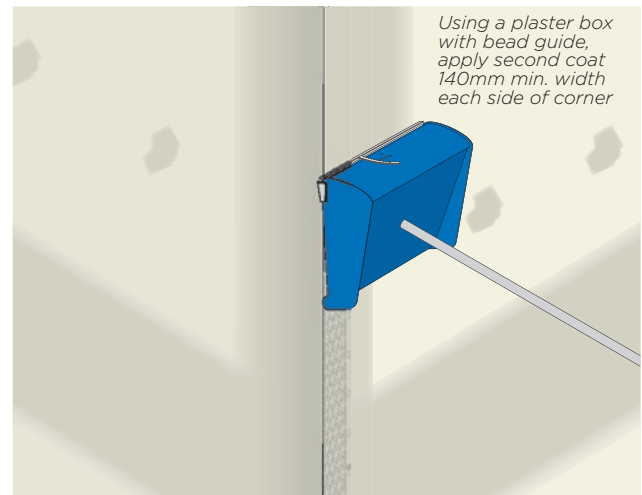
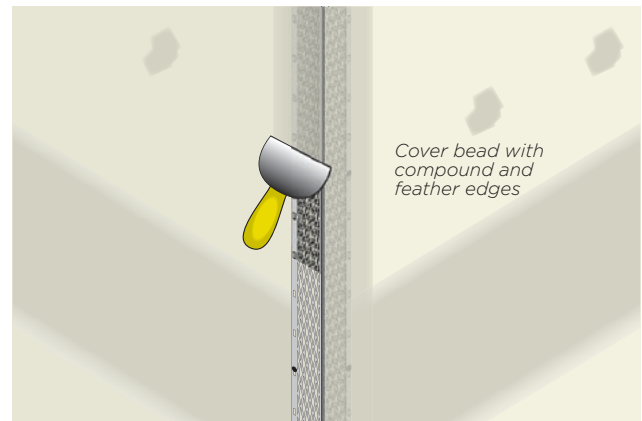
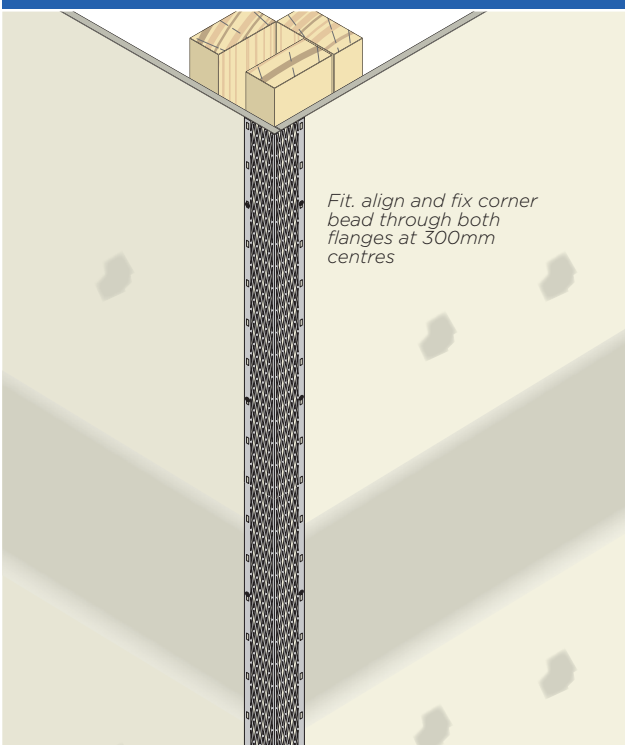


FIG 43: PROCEDURE FOR MECHANICAL JOINTING OF EXTERNAL CORNERS



Jointing Hand Applied

Hand Jointing of Recessed 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 the jointing 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.

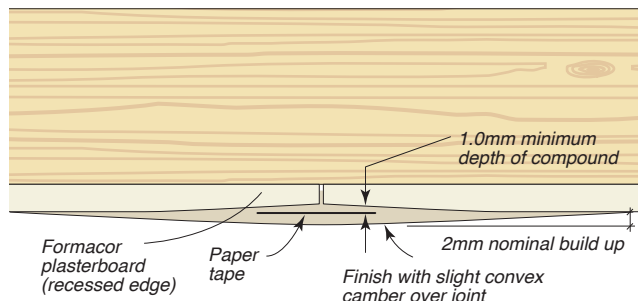
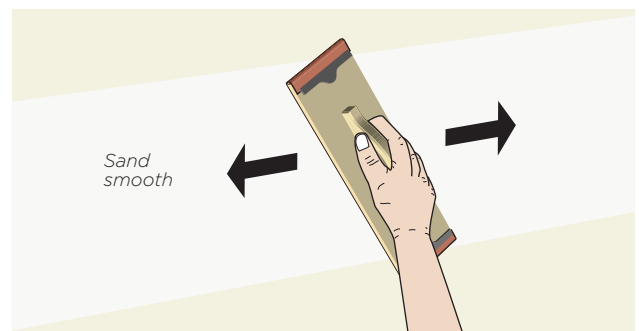
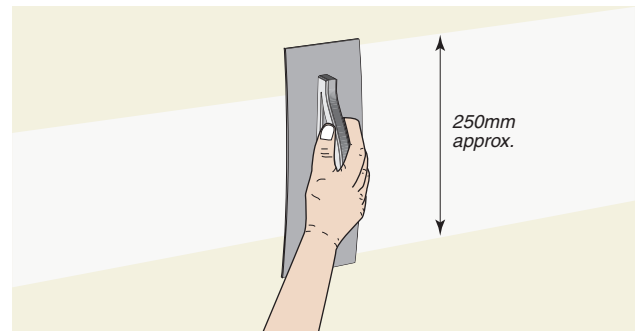
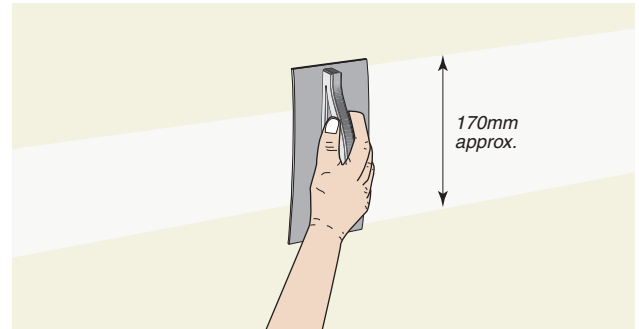
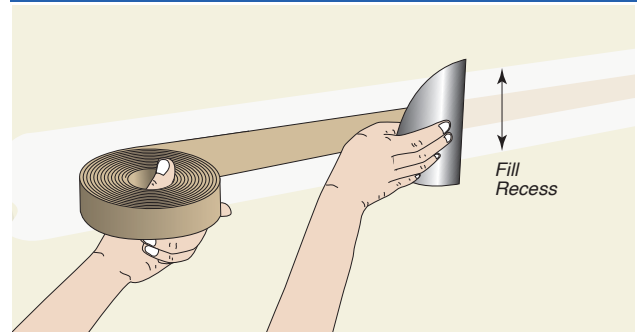
- Cover previously stopped fastener heads with a third coat of compound, laid in a different direction, extending beyond the previous coat by about 25mm. Ensure that the edges of the compound are neatly feathered and that there are no trowel edge marks left in the final stopping.
- Allow the finish coat of compound to dry for at least 24 hours before proceeding.

Sanding

- Sand smooth with 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.

FIG 44: JOINTING OF RECESSED JOINTS



Hand Jointing of Butt Joints Formed on Framing

Tape Coat

- Apply a thin layer of compound over the joint.
- Bed 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.

FIG 45: JOINTING OF BUTT JOINTS FORMED ON FRAMING

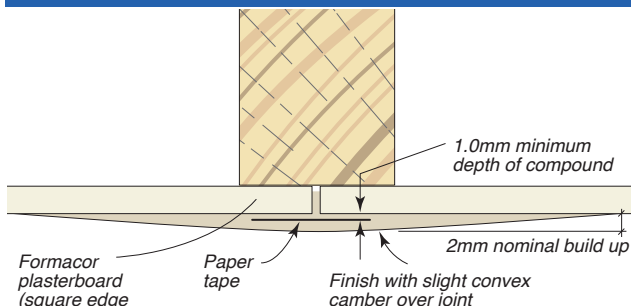
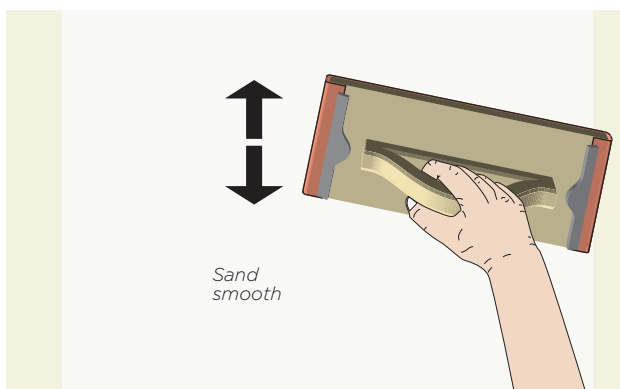
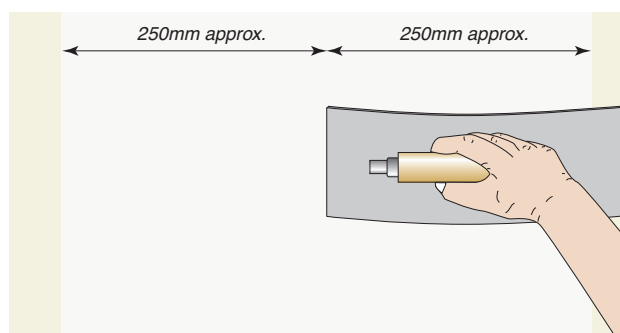
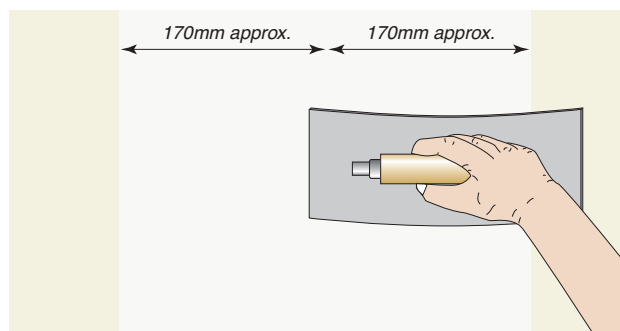
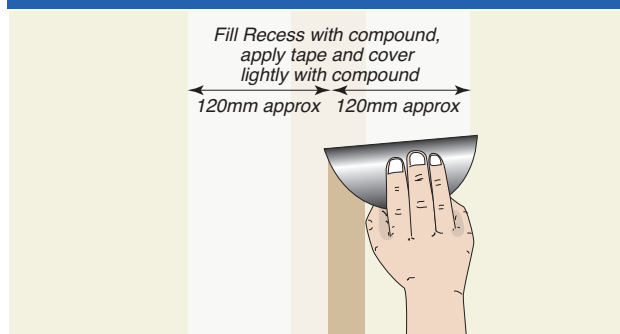


FIG 46: PROCEDURE FOR JOINTING OF BUTT JOINTS



Hand Jointing of Internal Corners

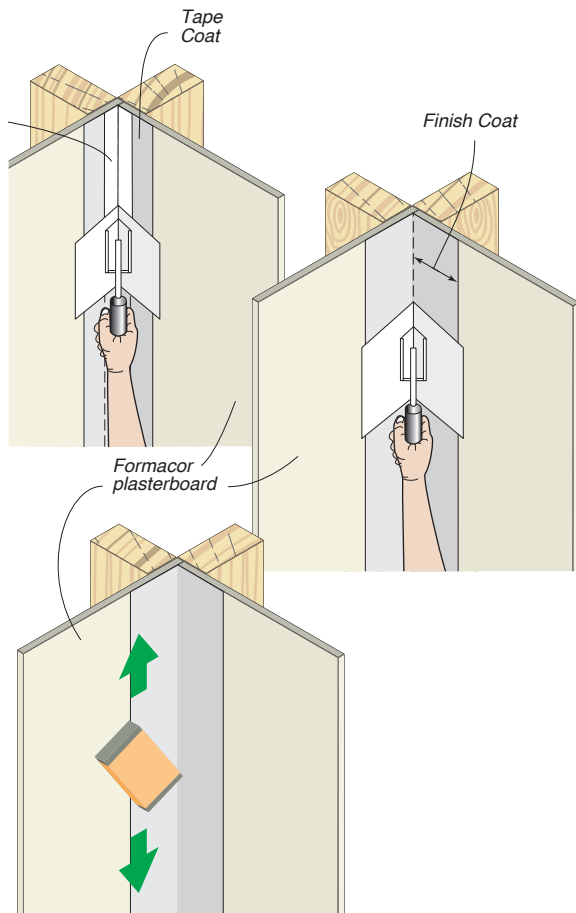
- Apply a tape coat to both sides of the corner, bed in the tape centrally over joint and cover lightly with compound. Ensure at least 1mm depth of compound under the tape.

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.

FIG 47: 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 dry, sand smooth with 150/180 grit paper or cloth, or with 220 grit sanding mesh.

FIG 48: JOINTING OF EXTERNAL CORNERS

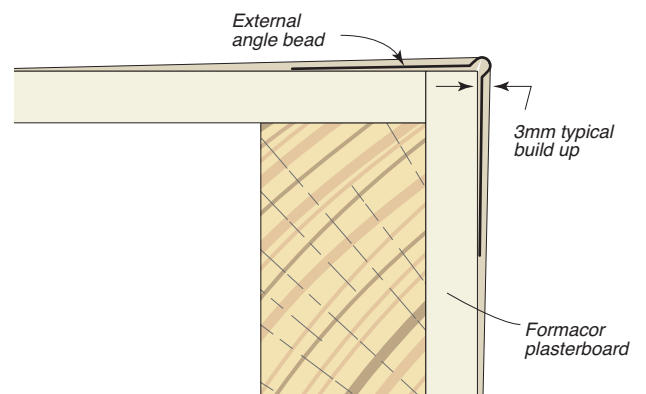
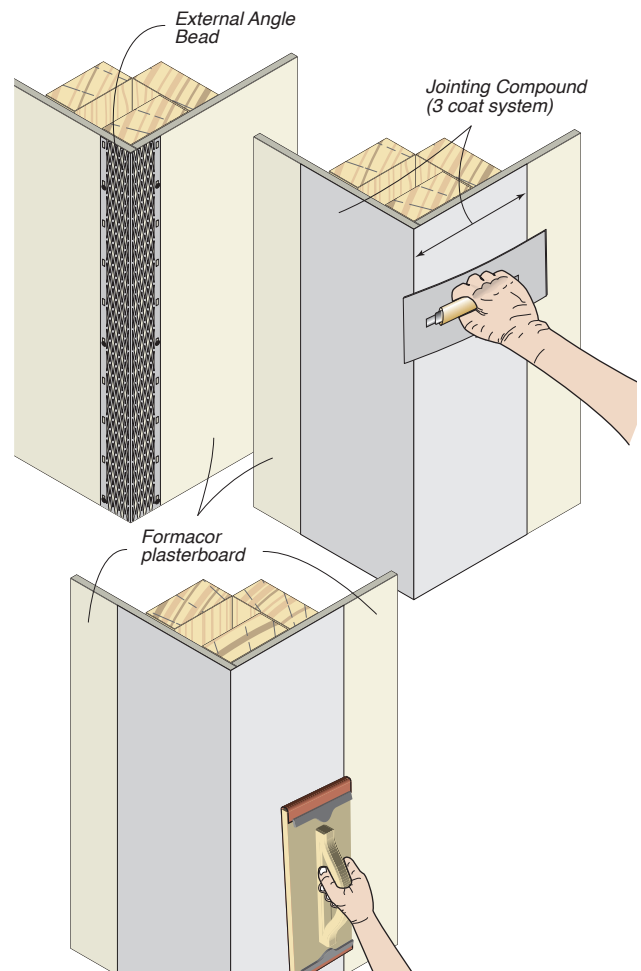


FIG 49: PROCEDURE FOR HAND JOINTING OF EXTERNAL CORNERS



Cornice Fixing

Cornice is designed to provide an attractive finish at the junction of the wall and ceiling. It can be used on Formacor plasterboard. It is recommended to adhere cornices using plaster-based adhesive, e.g. cornice adhesive, to attach cornices onto Formacor plasterboard surface.

IMPORTANT

When plaster-based adhesives 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 adhesive will not set correctly and will be lacking in strength.

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 adhesive.

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.

Plaster-based adhesives 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. Refer to the paint manufacturers for further details.

Cornice Fixing (Mechanical or Hand Fixing)

Preparation

- 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.
- Where the cornice aligns with a control joint in a wall or ceiling it is necessary to maintain the control joint through the cornice. Install the control joint in the wall and ceiling as recommended under 'Control Joints' and fill the gap in the cornice with flexible sealant suitable for painting.

Apply Cornice Adhesive

- Using an applicator tube, apply cornice adhesive or similar to wall/ceiling junction. Ensure adequate amount of adhesive is applied.

OR

- Butter 20-30mm wide beads of cornice adhesive or similar along the full length of each back edge of the cornice and to each mitre and butt joint.

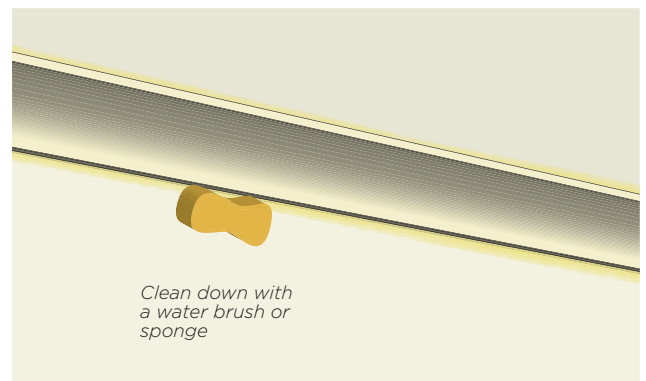
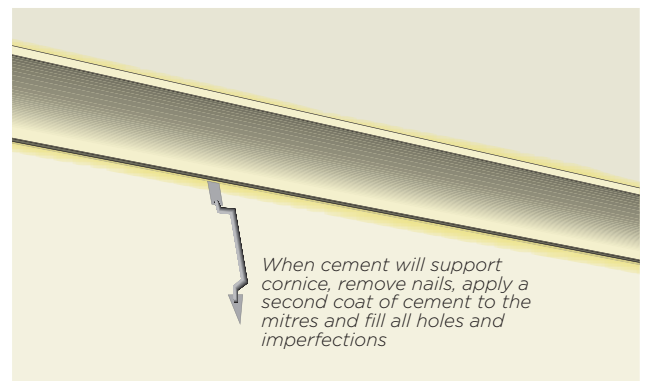
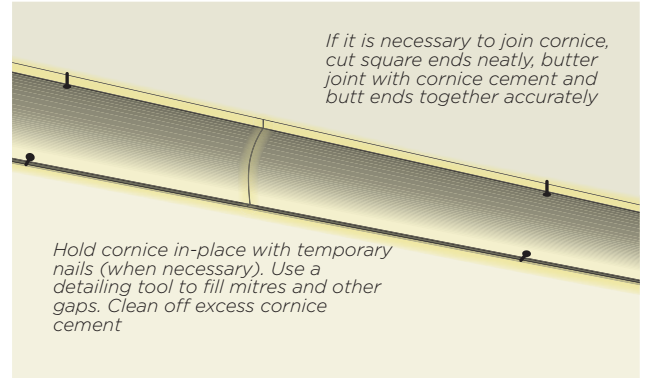
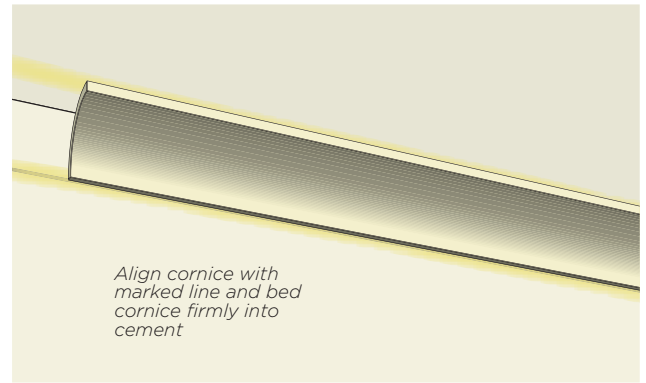
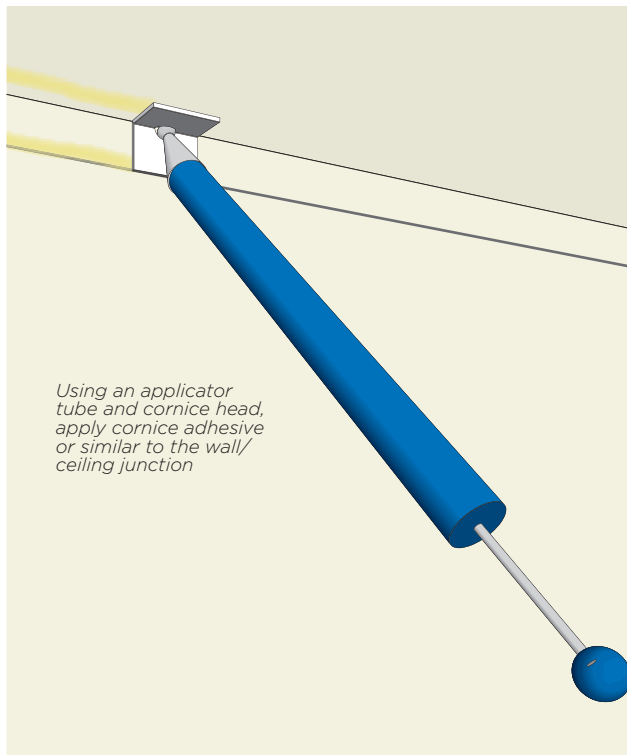
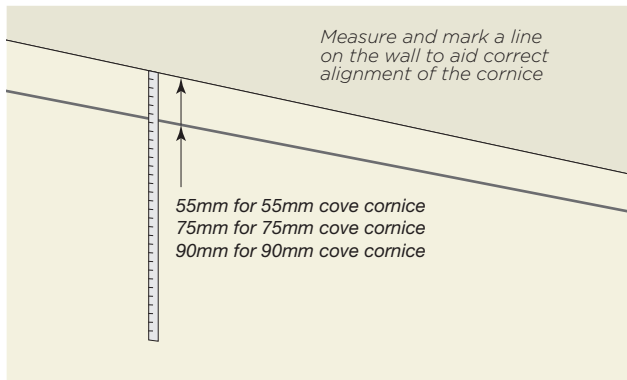
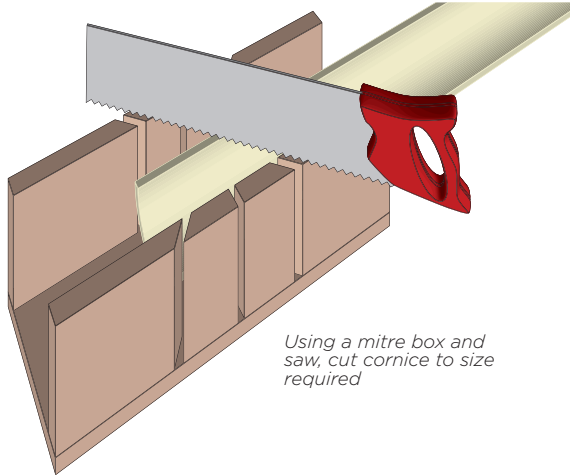
Install Cornice

- Position the cornice accurately to the marked lines. Press the cornice firmly into the cornice adhesive or similar, and where necessary hold cornice in position with temporary nails.
- If it is necessary to join cornice, align butt joints accurately.
- Clean off any surplus cornice adhesive.
- 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

- Apply a coat of cornice adhesive or similar to the mitres and butt joints, remove nails and fill holes and any imperfections, then brush with a clean water brush or sponge.

FIG 50: PROCEDURE FOR PREPARING AND FIXING CORNICE



Decoration

Interior Formacor 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.

Guidance towards a finished plasterboard surface with an even texture and appearance of flatness in preparation for brush, spray or roll painting is provided in AS/NZS 2589. Gypsum linings – Application and finishing with relevant information in Appendix B, Decoration. The delivery of an appearance of a uniform surface texture and colour is outlined in AS/NZS 2311:2017 Guide to the painting of buildings.

Further to these standards, the publication by BRANZ, “Good Practice Guide: Internal Linings”, identifies the standards of finish which may be expected from different installation, finishing and decoration practices and problems.

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 suitable sealer before the application of finishing coats. Refer to paint manufacturer for further information.
- 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 AS/NZS2311 and/or paint manufacturer’s recommendations for specific roller nap length for the desired finish.

Tiling

If tiles are required in waterproof and water resistant areas the tile adhesive must be compatible with the proprietary waterproofing membrane used.

Proprietary waterproofing membrane system and tile adhesives must be demonstrated as compatible in accordance with AS ISO 13007.

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 suitable gaps between tiles in corners.

Maintenance

It is important that Formacor 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 Formacor plasterboard continue to perform the function which they were originally intended.

In general, we recommend that Formacor 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.

Formacor plasterboard affected by smoke or fire damage is recommended to be replaced.

Minor impact damage to Formacor plasterboard resulting in small holes and cracks must be patched, stopped and finished as originally carried out using Formacor plasterboards 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.

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.

Health & Safety

Information on any known health risks of our products and how to handle them safely is listed in the Safety Data Sheet. To obtain a copy, telephone 0800 999 277 or visit <https://potters.co.nz/product-collection/formacor-plasterboard/>

Warranty Summary

Formacor plasterboard products are backed by a 10-year warranty for more information on the Formacor warranty, visit <https://potters.co.nz/product-collection/formacor-plasterboard/>



Disclaimer

Information in this Design and Installation Guide is general only. The installer is fully responsible for the proper interpretation of this Design and Installation Guide.

Always obtain specialist advice to ensure our products and their intended use are suitable and meet your project requirements. CSR Building Products (NZ) Limited its related companies disclaim all liability for loss and/or damage arising from the use of or reliance upon information provided in this Design and Installation Guide. Information on and specifications of Formacor products may change from time to time - please refer to the latest version of all brochures, data sheets and guidelines available at potters.co.nz. The Formacor logo and brand name is a trade mark of CSR Building Products (NZ) Limited. All other trade marks are the property of their respective owners. (C) 2026 CSR Building Products (NZ) Limited. All rights reserved.”.

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