

DURALINERTM PLUS

WET AREA LINING BOARD



Build it better with **BGC**

BGC

Fibre Cement

AUSTRALIAN OWNED & MANUFACTURED BGCINNOVADESIGN.COM.AU

HISTORY & MISSION

BGC FIBRE CEMENT AND PLASTERBOARD IS A PROUD AUSTRALIAN OWNED MANUFACTURER OF FIBRE CEMENT AND PLASTERBOARD PRODUCTS.



BGC has state-of-the-art manufacturing facilities in Perth and distribution centres in all states of Australia and in New Zealand.

Our distribution network ensures that our entire product range is readily available in all states of Australia and in New Zealand.

BGC has a team of technical specialists that can assist with all specification and design information to help ensure that you always **'build it better with BGC'**.

BGC HAS INTERESTS IN

- / Residential and commercial building
- / Building and construction products
- / Contract mining
- / Civil engineering construction and maintenance
- / Quarrying
- / Road transport
- / Property ownership and management
- / Insurance

Our mission at BGC is simple – we want to ensure that people can always **'build it better with BGC'**.

In keeping with our mission, we are constantly assessing and improving our products to ensure that we always provide cost effective, high quality and easy-to-use products to the market.

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DURALINERTM PLUS

WET AREA LINING BOARD



DURALINERTM PLUS IS A GENERAL-PURPOSE FIBRE CEMENT BUILDING BOARD. DESIGNED FOR FLUSH JOINTING, DURALINERTM PLUS IS HIGHLY EFFECTIVE FOR USE IN WET AREAS, INTERIOR LININGS, CEILINGS, AS A SUBSTRATE FOR CERAMIC WALL TILES AND FOR FIRE AND ACOUSTICALLY-RATED INTERIOR WALLS.

YOU CAN ALSO SPECIFY DURALINERTM PLUS FOR SOFFITS AND OTHER EXTERNAL APPLICATIONS WHERE THERE'LL BE NO DIRECT IMPACT FROM THE WEATHER.

DURALINERTM PLUS

- // Wide range of applications
- // Specify as part of fire and acoustic-rated wall systems
- // Rebated on 3 edges for easy jointing and installation

PRODUCT DESCRIPTION

Duraliner™ Plus is a general-purpose fibre cement building board intended for flush jointing. It has been specially formulated and prepared to meet the requirements for use in Wet Areas, Interior Linings, Ceilings, and as a substrate for Ceramic Wall Tiles.

In heavy duty commercial applications for wall tiling, fibre cement sheets are to have a minimum thickness of 9mm as per the Australian Standard AS 3958.1 "Ceramic Tiles - Guide to Installation".

Duraliner™ Plus is also manufactured in 12mm thickness for areas where maximum impact resistance is required.

Duraliner™ Plus is available with factory machined recesses on the two long sides and one end, ready for flush jointing.

PRODUCT INFORMATION

Duraliner™ Plus is manufactured from Portland cement, finely ground silica, cellulose fibres and water. It is cured in a high-pressure steam autoclave to create a durable, dimensionally stable product.

Duraliner™ Plus is manufactured to comply with the requirements of AS 2908.2 Cellulose Cement Products. It is classified by CSIRO as group 1 material in accordance with specification C1.10a of the BCA.

SHEET SIZE AND WEIGHT

The approximate weight of Duraliner™ Plus, at equilibrium moisture content, is as tabulated.

THICKNESS mm	WEIGHT kg/m ²	WIDTH mm	LENGTH mm					
			1800	2400	2700	3000	3600	4200
6	8.9	900		✓		✓		
		1200	✓	✓	✓	✓	✓	✓
		1350		✓		✓	✓	✓
9	13.2	1200		✓	✓	✓	✓	
		1350				✓	✓	
12	17.9	1200				✓		

FIRE RESISTANCE

Duraliner™ Plus has been tested by the CSIRO (Building, Construction and Engineering Division) in accordance with Australian Standard AS1530.3 see report number FNE 7524 (6mm Duraliner™ Plus) and FNE 7527 (9mm Duraliner™ Plus).

This report deemed the following Early Fire Hazard Indices:

// Ignitability Index 0
 // Spread of Flame Index 0
 // Heat Evolved Index 0
 // Smoke Developed Index 0 ~ 1

HANDLING & STORAGE

Duraliner™ Plus sheets must be stacked flat, up off the ground and supported on level bearers. The sheets must be kept dry, preferably by being stored inside a building. When stored outdoors they must be protected from the weather.

Care should be taken to avoid damage to the ends, edges and surfaces.

Sheets must be dry prior to being fixed, or painted.

Sheets must be carried on edge.

SHEET TOLERANCES

Duraliner™ Plus complies with the requirements of AS2908.2

HEALTH & SAFETY

Duraliner™ Plus is manufactured from cellulose fibre, finely ground sand, Portland cement and additives. As manufactured the product will not release airborne dust, but during drilling, cutting and sanding operations cellulose fibres, silica and calcium silicate dust may be released.

Breathing in fine silica dust is hazardous, prolonged exposure (usually over several years) may cause bronchitis, silicosis or cancer.

DO NOT BREATHE DUST

When cutting sheets, work in a well-ventilated area and use the methods recommended in this literature to minimise dust generation. If using power tools for cutting, drilling or sanding they must be fitted with appropriate dust collection devices or the operator should wear an approved (P1 or P2) dust mask and safety glasses.

These precautions are not necessary when stacking, unloading or handling fibre cement products.

For further information or a Material Safety Data Sheet contact the nearest BGC Sales Office.

SHEET CUTTING & DRILLING

Duraliner™ Plus may be cut to size on site.

Suitable cutting methods are:

// DURABLADE

180mm diameter. This unique cutting blade is ideal for cutting fibre cement. It can be fitted to a 185mm circular saw. Please ensure safe practices when using.

// SCORE AND SNAP

Using a straight edge score the sheet face 4 or 5 times with a Tungsten tipped 'Score & Snap' knife. While supporting the scored edge with the straight edge, snap the sheet upwards for a clean break.



// HAND SAWING

Mark out the cut lines on the face side of the sheet. Support the back of the Duraliner™ Plus sheet close to the cut. A fine-toothed saw can be used. A quick jabbing action gives best results.

// DRILLING

Duraliner™ Plus sheets can be drilled using normal high-speed masonry bits. Do not use the drill's hammer function. For small round holes such as tap penetrations, the use of a hole-saw is recommended.

// PENETRATIONS

Penetrations can be made by drilling a series of small holes around the perimeter of the cut out. Tap waste piece from the sheet face with a hammer. Support the underside of the opening to avoid damage. Clean rough edges with a rasp.

Large Rectangular Openings are formed by deeply scoring the perimeter of the opening with a 'score and snap' knife. Next, form a hole in the centre of the opening (see method above) then saw cut from the hole to the corners of the opening. Snap out the four triangular segments. Clean rough edges with a rasp.

QUALITY SYSTEMS

BGC Fibre Cement manufactures Duraliner™ Plus under the rigorous Quality Management System of the International Standard ISO 9001 and is the holder of Licence Agreement number QEC2955/13.

CONSTRUCTION DETAILS - FRAMING

Duraliner™ Plus is suitable for use with both timber and lightweight steel framing.

GENERAL

- // Framing must be constructed to comply with the Building Code of Australia.
- // The framing must be set to a true plane to ensure a straight finish to the wall.
- // Studs must be spaced at a maximum of 600mm centres.
- // Noggings must be spaced at a maximum of 1350mm centres. Noggings must align with the sheet joints see Figure 2a.
- // Duraliner™ Plus wall sheets must not be joined off the framing.

METAL FRAMING

Metal framing must comply with AS 3623 Domestic Metal Framing.

Duraliner™ Plus may be fixed directly to lightweight metal framing. The metal framing must not exceed 1.6mm in thickness and should provide some flexibility to accommodate any differential moisture and thermal movement of the Duraliner™ Plus.

If Duraliner™ Plus is used with rigid steel framing, it must be battened out with either timber or lightweight steel battens prior to fixing.

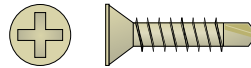
Timber battens must have a minimum thickness of 40mm to allow adequate nail penetration.

FASTENERS

For fixing 6mm and 9mm Duraliner™ Plus to timber framing, use 30 x 2.8mm Galvanised Clouts. For fixing 12mm Duraliner™ Plus to timber framing, use 40 x 2.8mm Galvanised Clouts. Fasteners to have a minimum head diameter of 6mm.



For fixing 6mm Duraliner™ Plus to lightweight steel framing, use No 8 x 20 Countersunk Screws. For 9mm and 12mm Duraliner™ Plus use 30mm Screws. For fixing 6mm Duraliner™ Plus to 0.8 - 1.6mm BMT steel framing use minimum No 8 x 20 Self Drilling Countersunk Screws. For fixing 9mm and 12mm Duraliner™ Plus to 0.8 - 1.6mm BMT steel framing use minimum No 8 x 30mm Self Drilling Countersunk Screws.



Do not place fixings closer than 12mm from sheet edges, or closer than 50mm from the sheet corners.

Sheet fixing must commence at the centre of the sheet and work out to the edges to prevent 'druminess'. The sheet must be held firmly against the framing when fixing to ensure breakout does not occur on the back.

CURVED WALLS

Duraliner™ Plus may be used on both convex and concave curved walls and requires no pre-wetting. With extra care, Duraliner™ Plus can be bent to the values in brackets in the table below.

	ALONG LENGTH	ACROSS WIDTH
6mm	1800 (1200)	3000
9mm	3000 (1800)	4000

To maintain the smoothness of the curve, studs are required at the spacings detailed below.

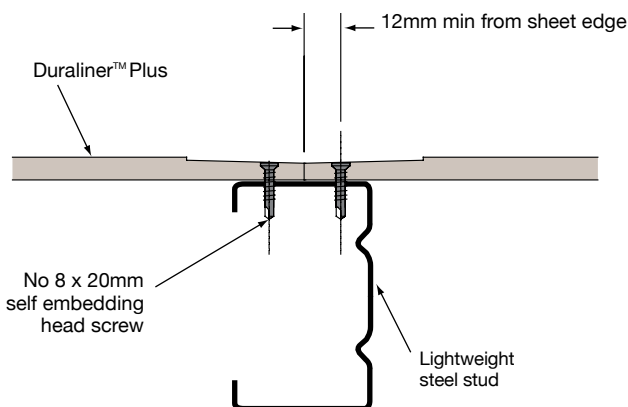
RANGE OF RADII (mm)	STUD SPACINGS
1200	150
Above 1200 to 1800	200
Above 1800 to 3000	300
Above 3000 to 20000	450*
Above 20000	600*

* or at one third of sheet width, whichever is the lesser.

NOTE:

BGC Fibre Cement strongly recommends that sheets be curved on the horizontal rather than vertical and if wetted to aid curving, the sheets must be normalised to ambient moisture content prior to flushing.

FIGURE 1 //
SHEET JOINT LIGHTWEIGHT STEEL FRAMING



TIMBER FRAMING

Timber framing must comply with AS 1684 - 1999 National Timber Framing Code.

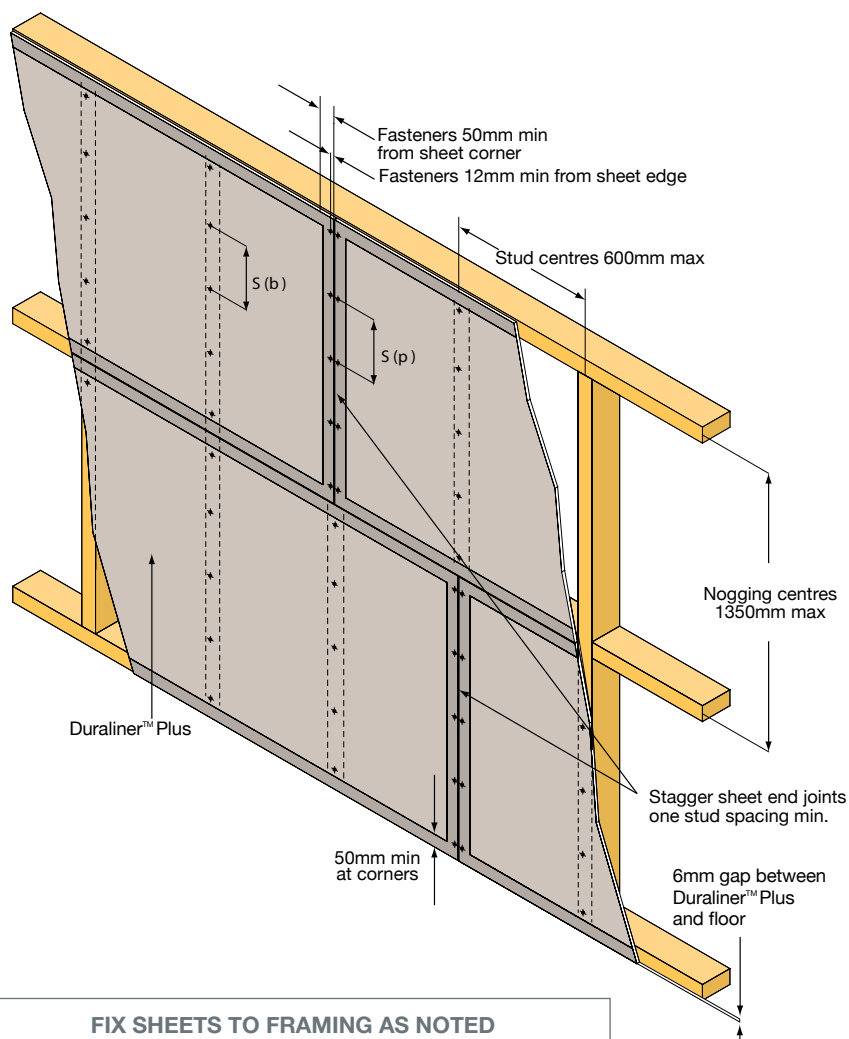
Duraliner™ Plus must not be fixed to wet framing. It is strongly recommended that kiln dried timber is used for framing.

If sheets are fixed to 'wet' framing, problems may occur at a later date due to excessive timber shrinkage.

NAIL OR SCREW FIXING SYSTEM (MECHANICAL FASTENERS) - SHEET LAYOUT

Duraliner™ Plus may be fixed vertically or horizontally. However, most flush jointed applications suit horizontal fixing.

FIGURE 2a //
HORIZONTAL SHEET LAYOUT TIMBER
OR STEEL FRAMING FOR UNTILED WALLS



	FIXING CENTRES		FIX SHEETS TO FRAMING AS NOTED		
	SHEET PERIMETER S(p)	SHEET BODY S(b)	STUDS	NOGGINGS	TOP & BOTTOM PLATES
UNTILED	200MM	300MM	✓	x	x

NOTES FIGURE 2A:

Framing must support all sheet joints when fixed horizontally. Install bottom sheets first then work upwards. Set bottom sheet 6mm clear of floor. Stagger vertical joints by at least one stud (600mm typical). Do not place fixings closer than 12mm from sheet edges, or closer than 50mm from the sheet corners.

TILED AREAS

When Duraliner™ Plus is to be covered with tiles it is essential that it is fixed with nails or screws only. No adhesive is to be used. The thickness of tiles used over Duraliner™ Plus is restricted based on the stud centres and thickness of Duraliner™ Plus.

Appropriate support angles are recommended for tiles exceeding 18mm in thickness. Placement and type of angle to be determined by a structural engineer. Contact your local BGC Fibre Cement office.

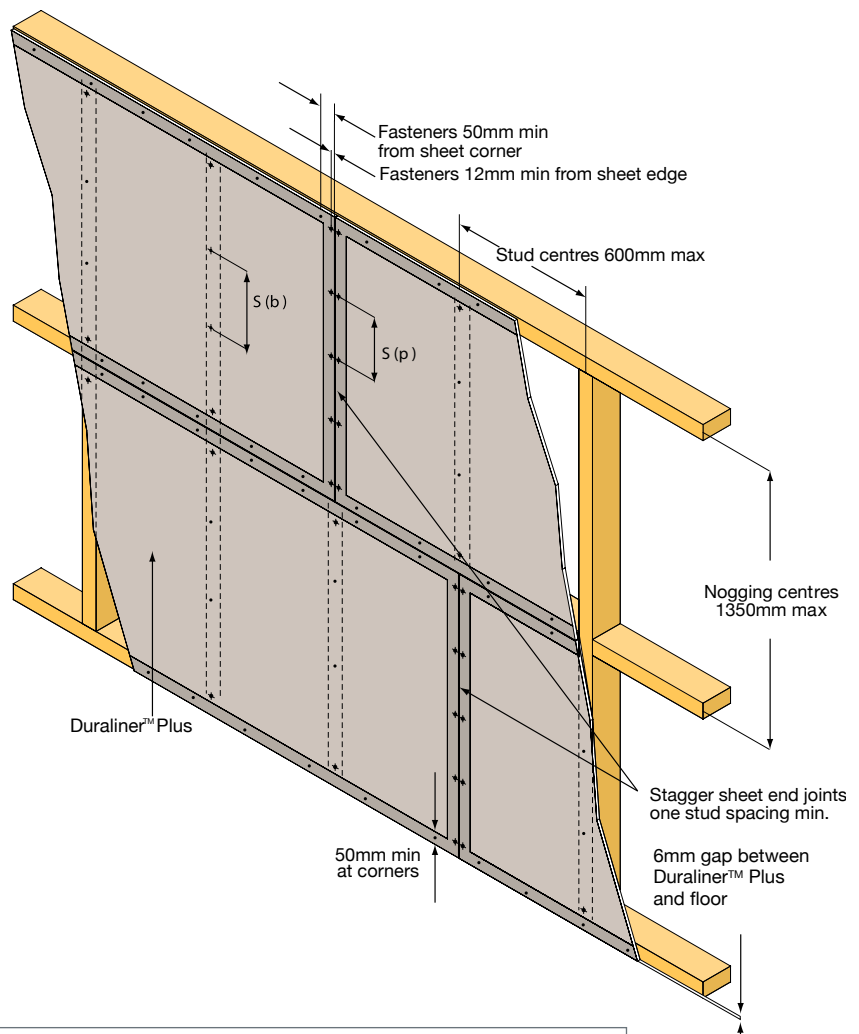
Membrane and tiles are to be applied as per Australian Standards and manufacturer's recommendations.

DURALINER™ PLUS THICKNESS (MM)	MAXIMUM TILE THICKNESS (MM)	
	Studs at 600mm centres	Studs at 450mm centres
6	9	13
9	13	18
12	18	>25

NAIL OR SCREW FIXING SYSTEM (MECHANICAL FASTENERS) - SHEET LAYOUT

Duraliner™ Plus may be fixed vertically or horizontally. However, most flush jointed applications suit horizontal fixing.

FIGURE 2b //
HORIZONTAL SHEET LAYOUT LAYERED
FOR TILED WALLS



	FIXING CENTRES		FIX SHEETS TO FRAMING AS NOTED		
	SHEET PERIMETER S(p)	SHEET BODY S(b)	STUDS	NOGGINGS	TOP & BOTTOM PLATES
TILED	150MM	200MM	✓	x	✓

NOTES FIGURE 2B:

Framing must support all sheet joints when fixed horizontally. Install bottom sheets first then work upwards. Set bottom sheet 6mm clear of floor. Stagger vertical joints by at least one stud (600mm typical). Do not place fixings closer than 12mm from sheet edges, or closer than 50mm from the sheet corners. Fixings must be placed at 150mm centres at all sheet edges. This includes internal and external corners.

ADHESIVE FIXING - STUD WALLS

Adhesive fixing must not be used where the wall is to be finished with wall tiles. Where the wall is to be tiled, nail or screw fasteners must be used.

For fixing of Duraliner™ Plus to stud walls in untiled applications, stud adhesive can be used. Daubs of adhesive are to be applied to the studs at a maximum of 250mm centres. The daubs of adhesive are to be approximately 25mm diameter.

Nail or screw fasteners are still required at 200mm centres on the sheet ends and 600mm along edges. These are concealed within the flush finishing.

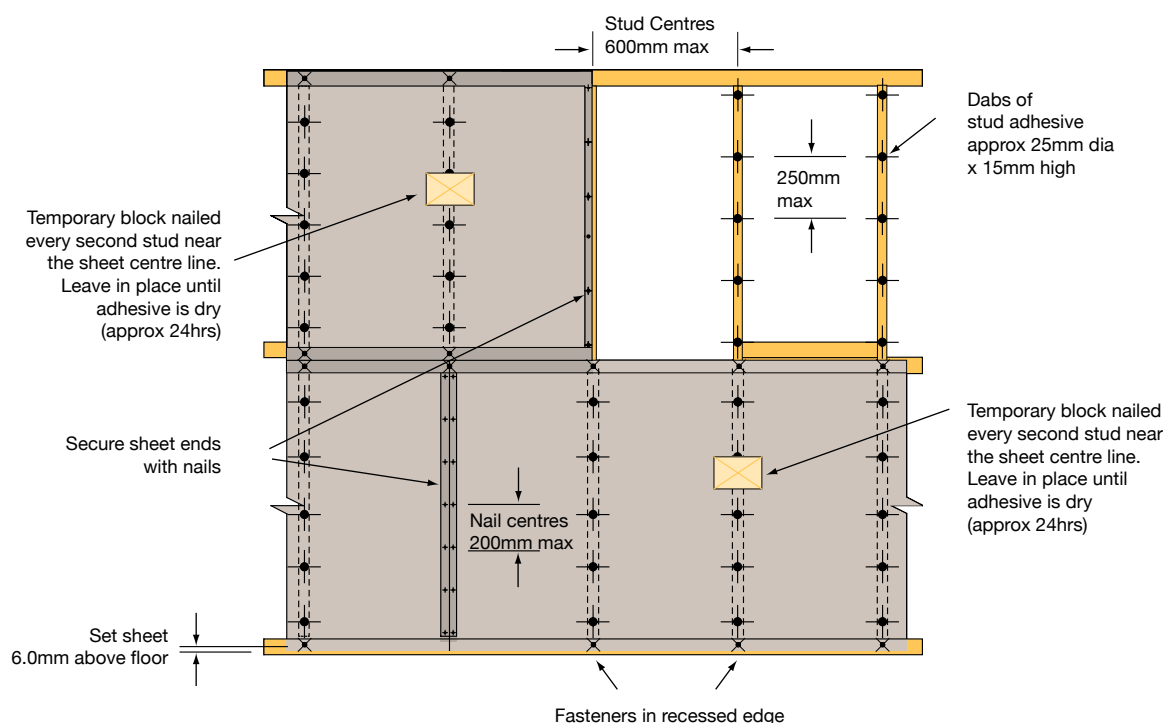
Figure 3 depicts the typical construction detail.

The Duraliner™ Plus must be pressed onto the adhesive until it sits flat. Temporary blocking or props must support the centre of the sheet until the adhesive is dry (normally 24 hours).

Adhesive daubs must never coincide with fasteners.

Adhesive fixing must not be used in fire rated construction.

FIGURE 3 //
DURALINER™ PLUS INSTALLATION ADHESIVE FIXING -
STUD CONSTRUCTION
NOTE: NOT SUITABLE FOR TILING

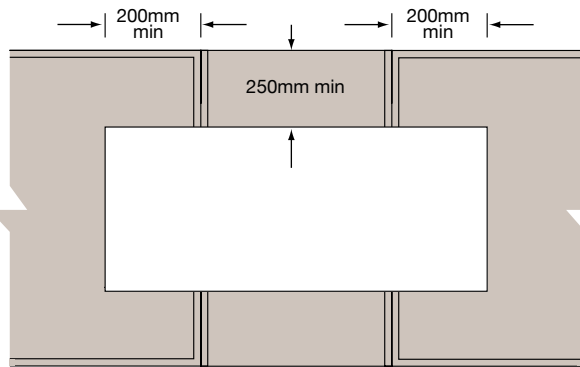


WINDOW & DOOR OPENINGS

To reduce the incidence of cracks appearing in the jointing, flush jointed sheets should be cut in, 200mm minimum, around window and door openings as depicted in Figure 4.

If a sheet joint must coincide with the corner of an opening BGC Fibre Cement recommends installation of a relief joint to control cracking. See Figure 5.

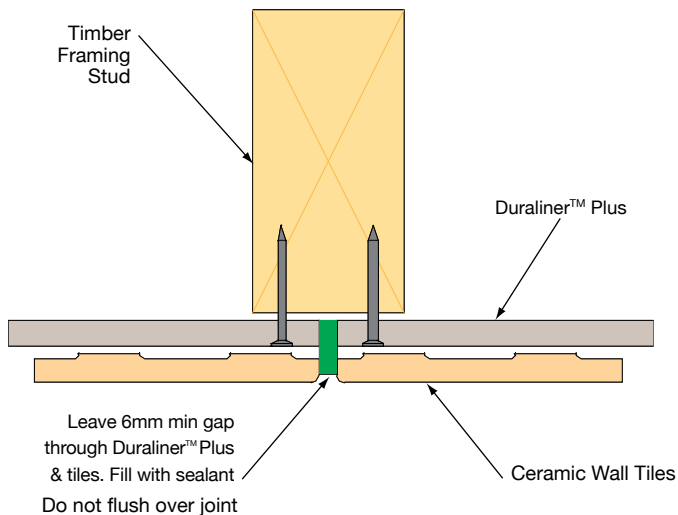
FIGURE 4 //
WINDOW AND DOOR DETAIL



RELIEF CONTROL JOINTS

The use of relief joints is to control cracking at locations such as window or door openings, when cutting sheets in around the opening is impractical.

FIGURE 5 //
RELIEF JOINT (TILED)



MOVEMENT CONTROL JOINTS

If a continuous run of sheeting exceeds 4.2m for tiled areas, or 6m for untiled areas, then it must be broken with a movement control (expansion) joint. BGC Fibre Cement recommends the provision of a control joint every 4.2m in case tiling is undertaken at a later date.

For tiled areas the control joint must carry through the framing, sheeting and tiling, see Figure 6.

For untiled areas the use of a Rondo P35 or Peer PXJ30 jointing kit is recommended, see Figure 7.

FIGURE 6 //
TILED CONTROL JOINT

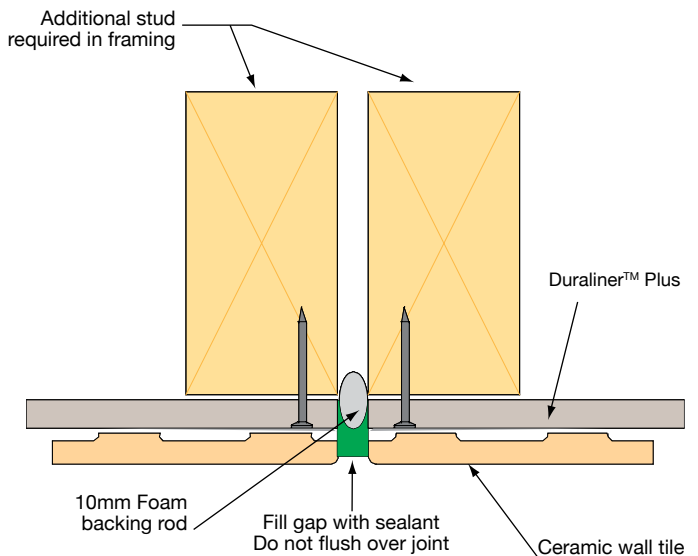
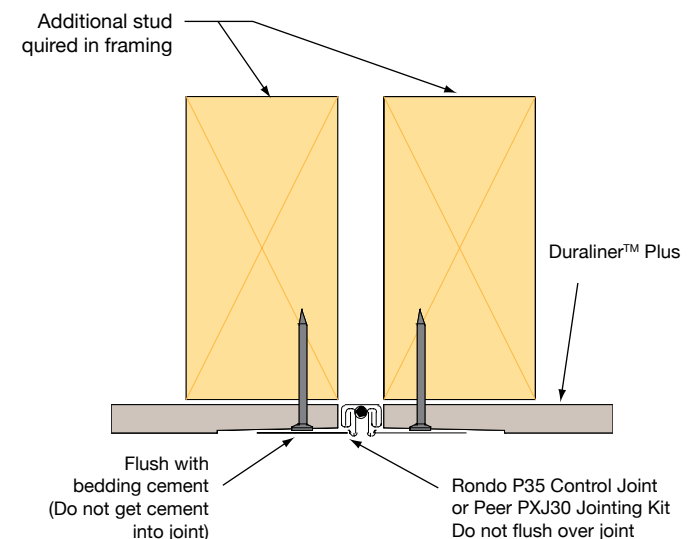


FIGURE 7 //
UNTILED CONTROL JOINT



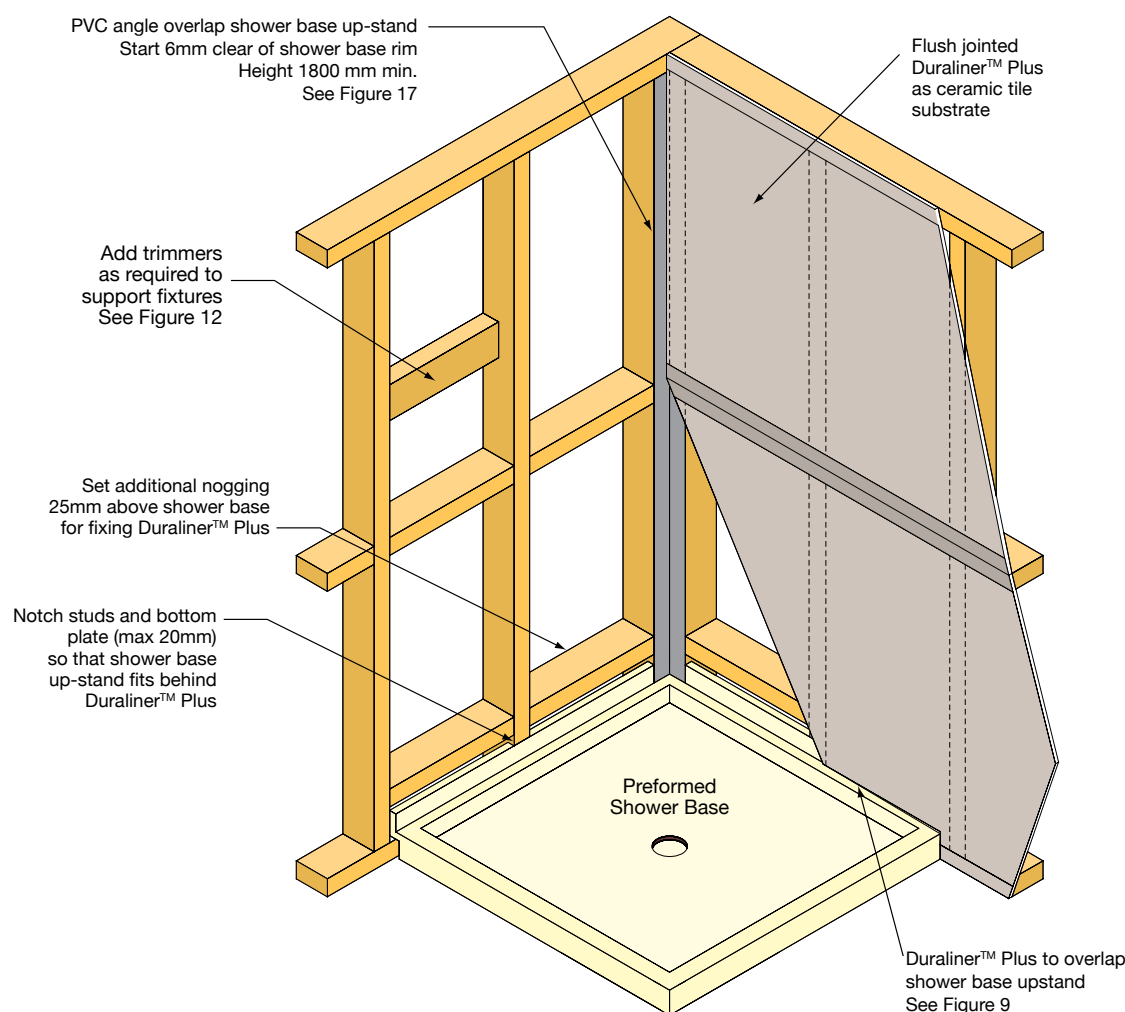
WET AREAS

Wet areas are walls in shower alcoves or surrounding a bath that include a shower. Duraliner™ Plus provides a suitable substrate for ceramic tiles in these applications.

Semi-wet areas are walls adjacent to sanitary fittings such as baths, basins and toilet suites. Duraliner™ Plus is a suitable substrate for ceramic tiles, paint, wallpaper or vinyl finishes in these applications.

Satisfactory performance of wet area systems depends on strict adherence to the Building Code of Australia.

FIGURE 8 //
TYPICAL SHOWER RECESS DETAIL



NOTES FIGURE 2A:

The inside edge of the shower base up-stand must fit in behind the Duraliner™ Plus without distorting it. To achieve this the studs and bottom plate can be notched out, maximum 20mm, or alternatively battens can be used to set the Duraliner™ Plus clear of the framing.

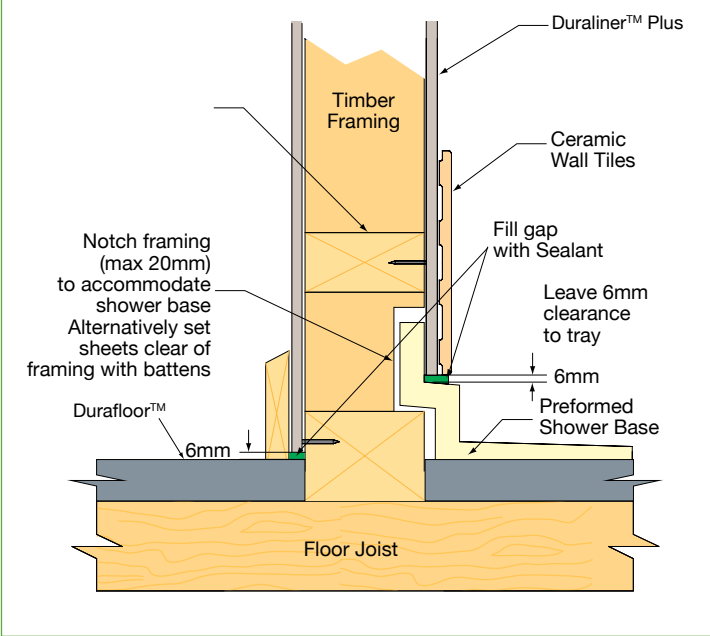
A PVC angle or waterproof lining (membrane) should be fixed in the internal corner behind the Duraliner™ Plus. This angle must project inside the shower base up-stand. It should start 6mm above the shower base rim and extend to a minimum height of 1800mm. Both flanges of the angles should be nailed to the framing at a maximum 600mm centres.

SHOWER RECESSES

Table 1 summarises appropriate construction details for use with different sub-floor materials.

Table 1			
SUB FLOORING	PREFORMED SHOWER BASE See figures 8&9	FULL INSITU WATERPROOF MEMBRANE See figure 10	PERIMETER FLASHING ONLY See figure 11
TIMBER FLOORING	✓	✓	
PANEL FLOORING SUCH AS PLYWOOD OR PARTICLE-BOARD	✓	✓	
COMPRESSED FIBRE CEMENT	✓	✓	✓
CONCRETE SLAB	✓	✓	✓

FIGURE 9 //
PREFORMED SHOWER BASE

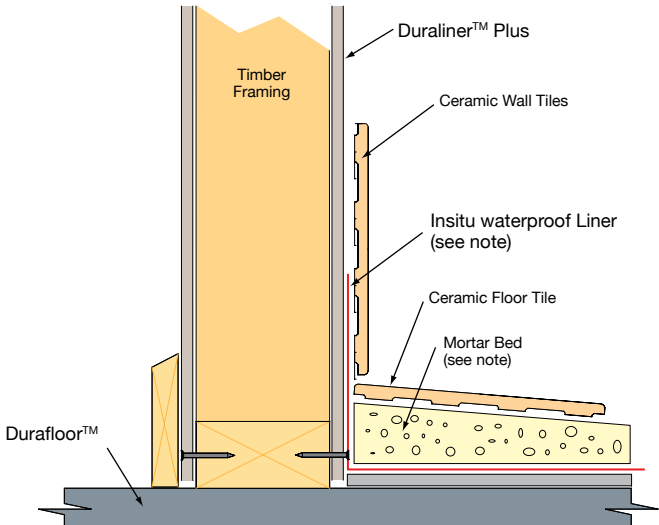


NOTES FIGURE 9:
The Duraliner™ Plus must project inside the vertical lip of the shower base up-stand. A 6mm gap must be left between the Duraliner™ Plus and the shower base rim. This gap must be filled with a bead of mould resisting flexible sealant.

The Duraliner™ Plus must be flush jointed.

Ceramic wall tiles must be installed over the Duraliner™ Plus. The wall tiles must finish 6mm above the shower base rim. This gap must be filled with a mould resisting flexible sealant.

FIGURE 10 //
SHOWER & WET AREA WALL/FLOOR
JUNCTION TYPICAL DETAIL
(INSITU WATERPROOF LINER)



NOTES FIGURE 10:
The waterproof lining must be installed to the manufacturer's specification.

The waterproof lining must extend 150mm up the walls or 25mm above any hobs (whichever is greatest).

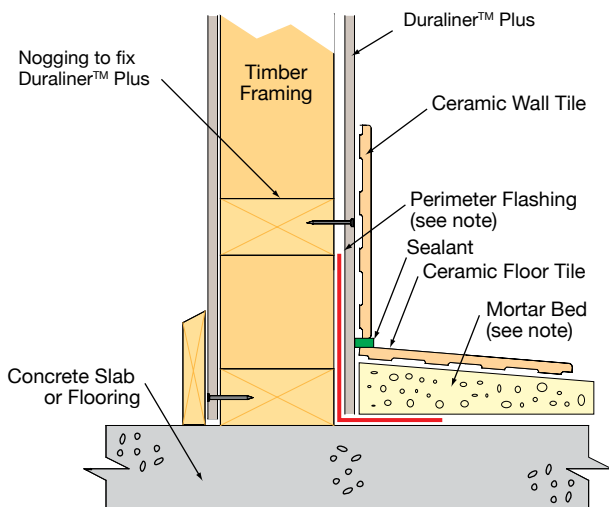
Internal corners in the shower recess must be sealed to a height of 1800mm minimum with the waterproof lining or an equivalent treatment.

Mortar Bed: The shower base must have a minimum fall of 1:60 to a floor waste drain.

The Duraliner™ Plus sheets must be flush jointed and tiled over.

Refer to the BCA and AS3740 for waterproofing of wet areas in residential buildings.

FIGURE 11 //
SHOWER BASE & WET AREA WALL/FLOOR
JUNCTION TYPICAL DETAIL
(PERIMETER FLASHING)



NOTES FIGURE 11:

Perimeter flashing may be preformed PVC angles or a waterproof flashing strip such as Hypalon.

The flashing should extend 80mm min up the wall and 50mm min across the floor. The corner detail must be waterproof.

The flashing must be bonded to the floor with a two-part flexible epoxy resin designed for this application.

The flashing must not be bonded to the Duraliner™ Plus wall sheets.

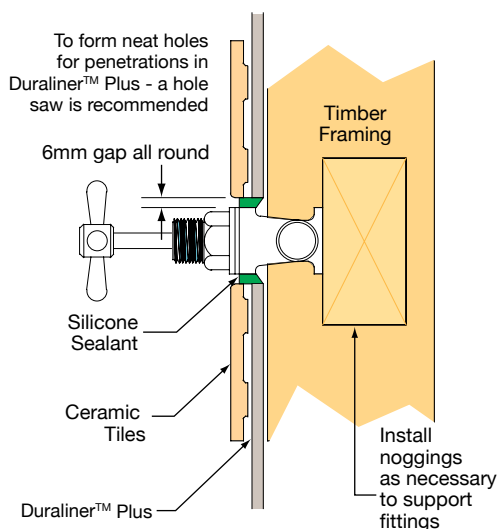
An additional nogging must be installed so that the bottom fixing of the Duraliner™ Plus sheet is above the flashing.

Internal corners of the shower recess must be sealed with a bonded PVC angle or flashing to a minimum height to 1800mm.

Mortar Bed: The shower base must have a minimum fall of 1:60 to a floor waste drain.

The Duraliner™ Plus sheets must be flush jointed and tiled over.

FIGURE 12 //
SEALING PREPARATIONS



NOTES FIGURE 12:

The Duraliner™ Plus should be cut out to leave a 6mm gap all round the fixture. This gap should be filled with a mould resistant flexible sealant.

BGC recommends using a hole saw to make a neat cut out for fittings such as taps, shower roses etc.

Additional framing must be installed as required to properly support all fixtures.

FIGURE 13 //
BATH RIM INSTALLATION DETAIL

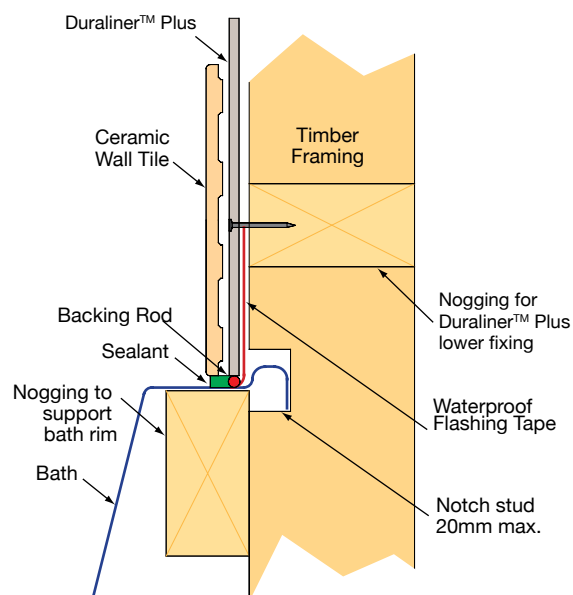
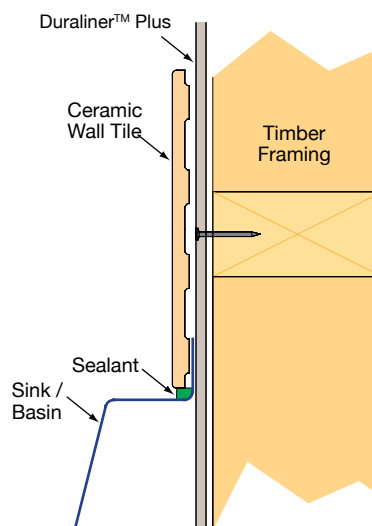


FIGURE 14 //
SINK/BASIN FLANGE DETAILS



NOTE: This section is for areas outside of wet areas such as adjoining walls within a bathroom that is untiled. Any areas that are within a wet area must be trowelled with BGC Exterior and Wet Area Base Coat. (Refer page 15)

The edges to be joined must be recessed.

Before jointing, sheets that have been cut on site, or the un-recessed end of Duraliner™ Plus sheets must be recessed. The recess should be a nominal 40mm wide by 1.5mm deep. The Hitachi 'Easy Bevel' (Model EB100) or equivalent is specifically designed for this purpose. The recessed surfaces must be sealed using a PVA or Acrylic sealant, such as Cemstick, Lokcrete or Bondcrete.

FIRST COAT: Fill the recess evenly with bedding/base cement such as GTEK™ Basecoat 45, 60 or 90. For flat joints and internal corners install a perforated paper tape over the centre of the joint. Self adhesive tape is not be used. Always use a perforated paper tape. Additional bedding cement is then applied to cover the paper tape and the joint edges feathered out to produce a joint that is approximately 100mm wide (50mm each side of the sheet edges).

Internal corners should be prepared and flushed as shown in figure 17.

For external corners an external angle bead should be fitted prior to filling. Paper tape is not used for external corners. Refer figure 18.

Apply a layer of bedding cement over all fastener heads.

SECOND COAT: After allowing for the first coat to dry, a second coat of bedding cement such as GTEK™ Basecoat 45, 60 or 90 is applied. This coat should overlap the first coat by about 40mm each side (total width 180mm) and be feathered out to produce an unobtrusive joint.

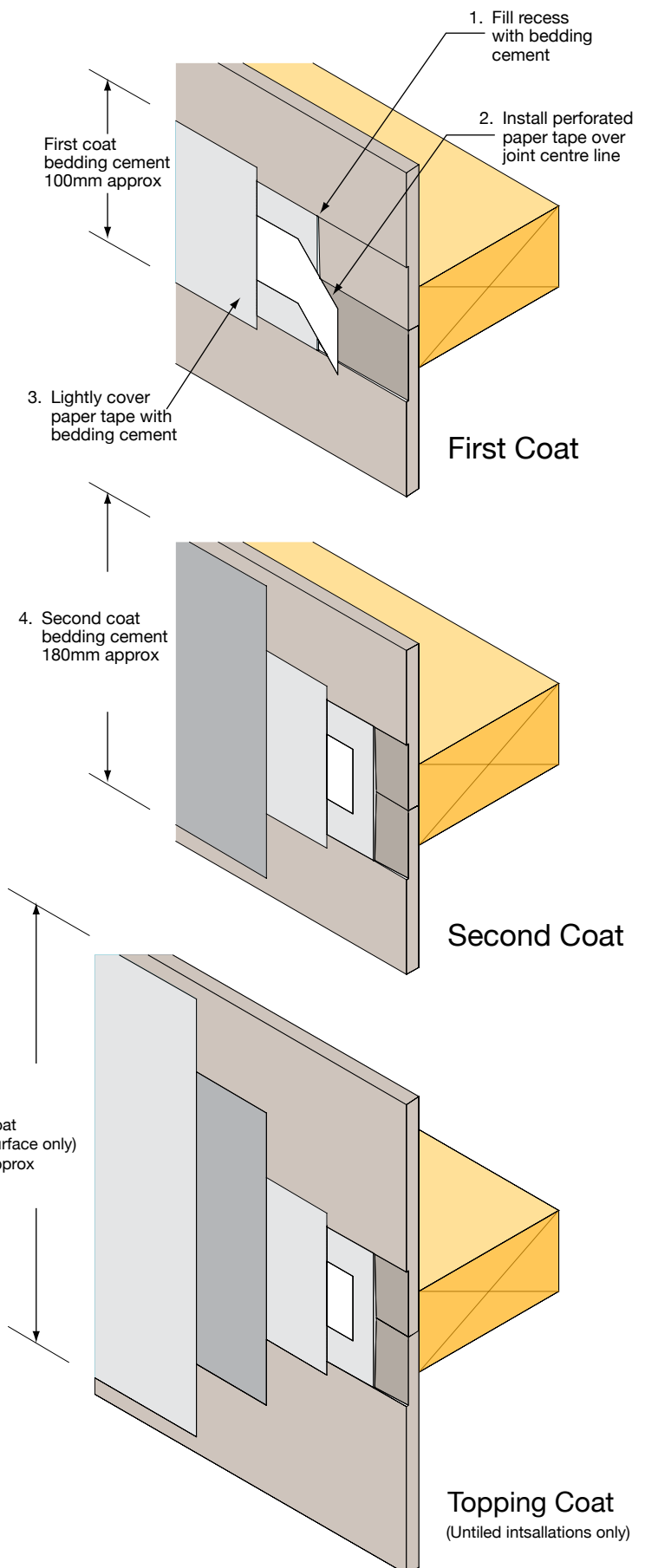
Apply a second layer of bedding cement to all fastener heads.

TOPPING COAT: (For untiled areas only): After the bedding cement has dried thoroughly, a layer of topping cement such as GTEK™ All Purpose, GTEK™ Topcoat can be applied. This layer should overlap the preceding layer by 45mm to 50mm each side of the joint and be feathered out to produce an unobtrusive finish.

Allow 24 hours for the Topping Compound to dry. Sand with 180 grit paper to match the finish of the Duraliner™ Plus.

Topping Compound must not be used on top of Basecoat that is to be tiled.

FIGURE 15 //
FLUSH JOINTING



WET AREA JOINTING

The edges to be joined must be recessed.

Before jointing sheets that have been cut on site, or the un-recessed end of Duraliner™ Plus sheets must be recessed. The recess should be a nominal 40mm wide by 1.5mm deep. The Hitachi 'Easy Bevel' (Model EB100) is specifically designed for this purpose. The recessed surfaces must be sealed using a PVA or Acrylic sealant, such as Cemstick, Lokcrete or Bondcrete.

Evenly fill all recessed joints and both sides of any corners with BGC Exterior and Wet Area Basecoat. Firmly bed into BGC Exterior and Wet Area Base Coat ensuring all air bubbles are removed.

Apply a skim coat of BGC Exterior and Wet Area Base Coat over embedded paper tape ensuring the paper tape is completely covered. Cover all fastener heads with BGC Exterior and Wet Area Base Coat.

Apply a skim coat of BGC Exterior and Wet Area Base Coat to the edges of the plasterboard at sheet junctions with shower bases and baths, feathering out the BGC Exterior and Wet Area Base Coat onto the board. Allow 24 hours to dry before tiling.

FIGURE 16 //
WET AREA JOINTING

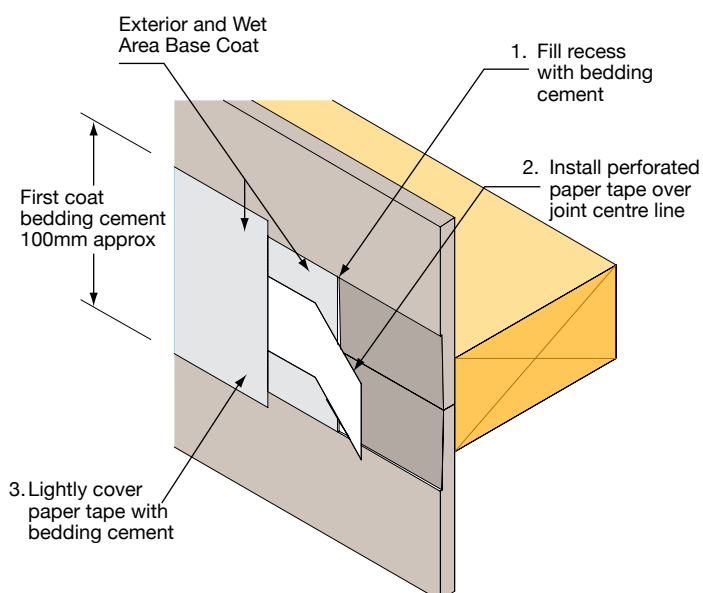


FIGURE 17 //
FLUSH JOINTING INTERNAL CORNER

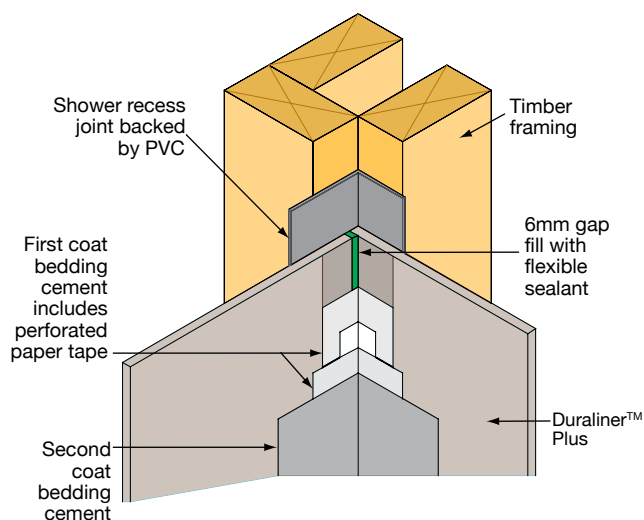
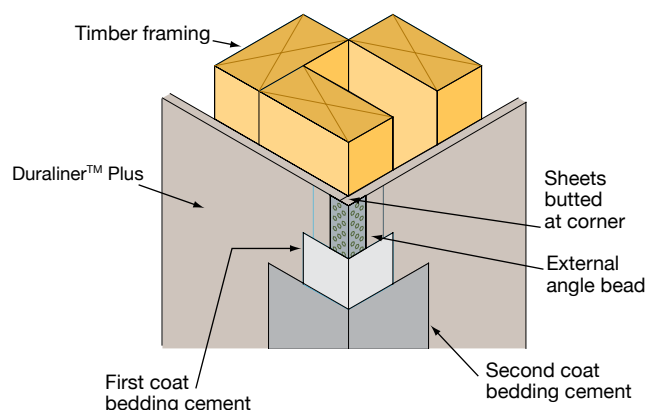


FIGURE 18 //
FLUSH JOINTING EXTERNAL CORNER



DRY CLAD MASONRY WALLS

Duraliner™ Plus can be used to cover brick and masonry construction to obtain a smooth flat finish for subsequent decoration or tiling. Table 2 summarises the various methods recommended, their applications and limitations.

Table 2

METHOD	CLAY BRICK CONCRETE BLOCKS CONCRETE	AAC	FIGURE	REMARKS
TIMBER BATTEN	✓	✓	19	// Recommended for use with tile applications // Suitable for uneven and misaligned walls // May be used over flaking walls and drummy render // Provides a cavity for services if required
STEEL BATTEN OR FURRING CHANNEL	✓	✓	19	
FURRING CHANNEL & CLIP SYSTEMS	✓	✓	20	
PLASTIC NAILS	X	X	21	// For use with AAC products // Suitable for tile applications

TIMBER & STEEL BATTENS

Sheets may be installed horizontally or vertically.

The wall should be battened out in accordance with Figure 20.

Timber battens should have a minimum thickness of 40mm to allow adequate nail penetration and holding. Timber battens that support sheet joints should have a minimum face width of 45mm. All other battens should have a minimum face width of 35mm.

Steel battens/furrings that support sheet joints should have a minimum face width of 38mm. All other steel battens/furrings should have a minimum face width of 30mm.

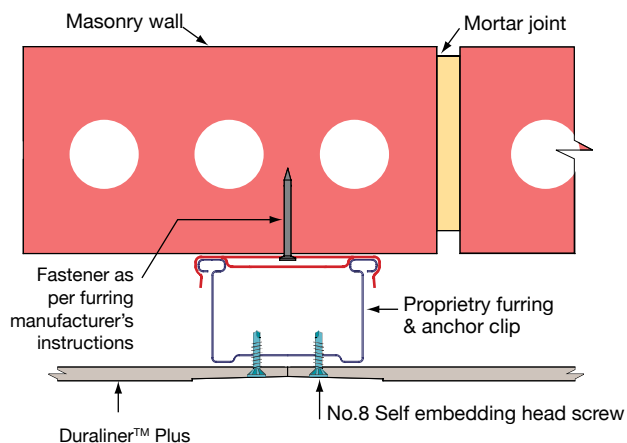
Typical steel batten systems are Rondo Part No 129 or 308 furring channels with Rondo Part No 237 clips, or Peer FC18/FC28 channels with C37 clips. See Figure 21.

Vertical battens must be provided at a maximum of 600mm centres to suit sheet joints.

The battens should be packed to correct any misalignment or unevenness in the base wall.

Fix the battens to the base wall using suitable masonry nails or wall anchors.

FIGURE 19 //
DURALINER™ PLUS INSTALLATION TO
MASONRY WALL



TIMBER & STEEL BATTENS

Install services before installing Duraliner™ Plus.

Install Duraliner™ Plus in accordance with Figure 2.

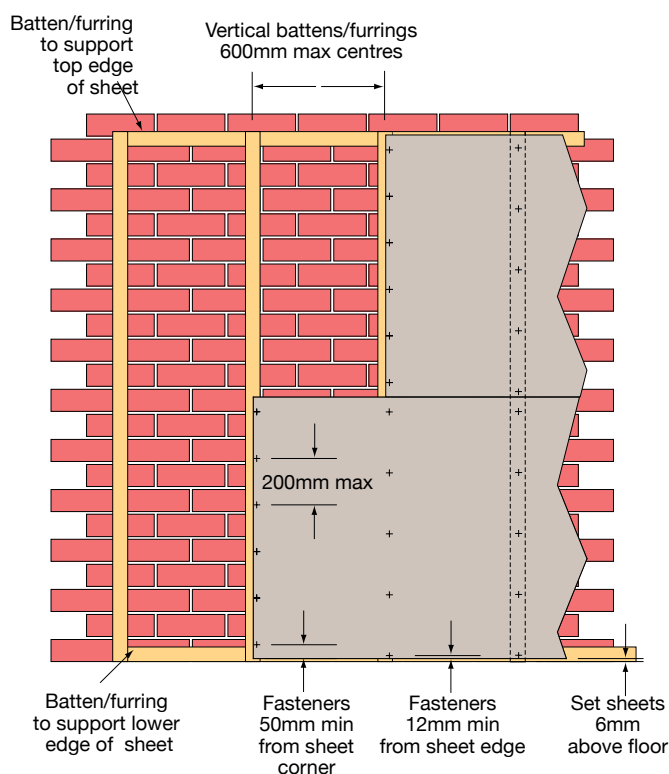
Sheet ends to be joined centrally over a batten or furring channel. For untiled walls fix at a maximum of 200mm centres on sheet ends and at 300mm maximum centres in the body of the sheet.

For tiled walls, fixings are to be at a maximum of 200mm centres on the sheet ends and also in the body of the sheet. Where the wall is to be tiled, it is recommended that noggings be installed under all sheet joints to alleviate any sheet deflection upon impact.

Control joints should be installed:

- // To coincide with any movement control (expansion) joints in the structure.
- // At the junction of any dissimilar base wall type or construction.
- // To break any continuous run of Duraliner™ Plus greater than 4.2m tiled applications or 6m untiled applications.

FIGURE 20 //
TYPICAL DURALINER™ PLUS INSTALLATION TO MASONRY WALL BATTENS/FURRINGS



PLASTIC NAILS

This system is only suitable for use with standard density (approx. 550kg / m³) – Autoclaved Aerated Concrete (AAC) block walls. For higher density AAC use the furring channel system.

The base wall should be flat and true (maximum variation must not exceed 15mm).

Sheets may be installed horizontally or vertically.

The sheet layout should be generally in accordance with Figure 19.

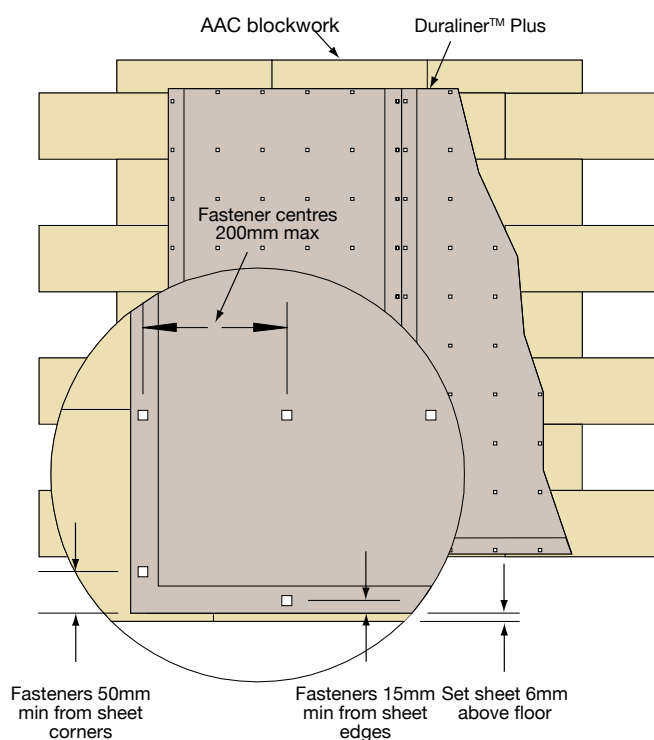
Chase the walls and install any services before installing Duraliner™ Plus.

Using an 8mm hole punch, indent the Duraliner™ Plus lining at all fastening points to locate and assist penetration of the plastic nails. See Figure 22.

Install the Duraliner™ Plus sheets, and fix by hammering the plastic nails flush with the sheet surface.

NOTE: The plastic nails must not be installed closer than 50mm to sheet corners or closer than 15mm to sheet edges.

FIGURE 21 //
DURALINER™ PLUS INSTALLATION TO AAC WITH PLASTIC NAILS



BRACING

Duraliner™ Plus can be used to provide bracing to resist racking loads due to wind loadings when installed vertically.

The use of Duraliner™ Plus to provide bracing on timber dwellings are those built to the Australian Standard for "Residential timber-framed construction".

AS1684.2 (Non-cyclonic areas)
AS1684.3 (Cyclonic areas)

Racking forces due to wind loading shall be calculated as per these Australian Standards.

For bracing data on other construction methods and applications, contact your BGC Fibre Cement Sales Office.

NOMINAL WALL BRACING

Up to 50% of the total bracing requirements can be supplied by BGC Duraliner™ Plus sheeting installed normally. To be eligible for inclusion in calculations as nominal wall bracing:

- // The minimum length of each nominal bracing panel shall be 450mm.
- // Nominal bracing shall be distributed evenly throughout the building

The bracing capacity for nominal bracing is given in the following table:

NOMINAL SHEET BRACING WALLS

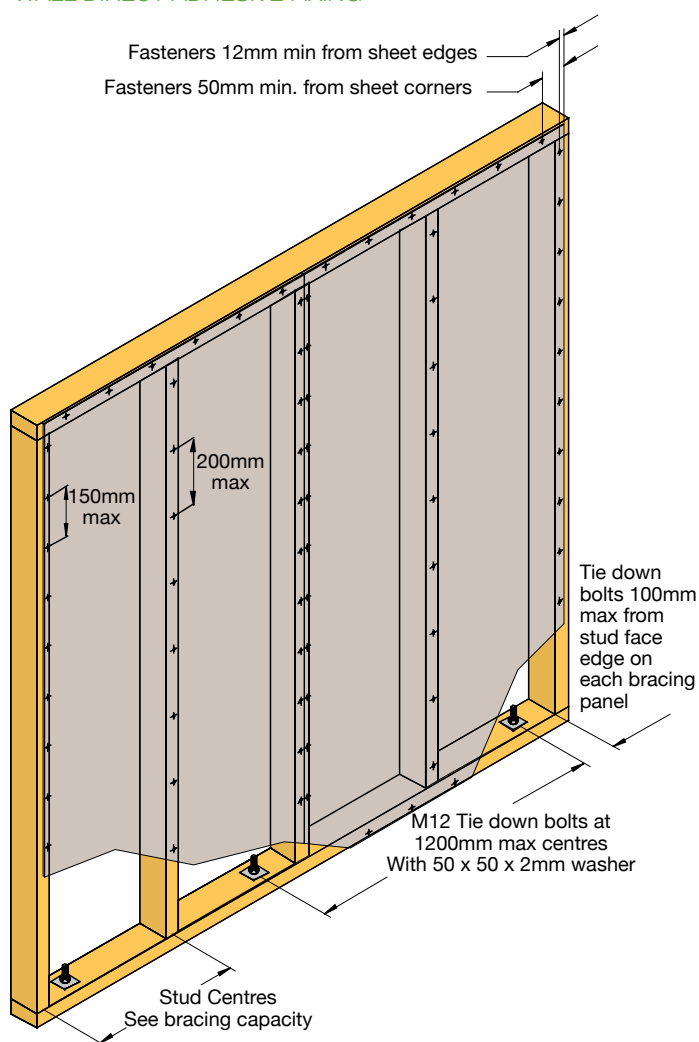
METHOD	BRACING CAPACITY (KNm)
Sheeted one side only	0.45
Sheeted two sides	0.75

STRUCTURAL WALL BRACING

The use of Duraliner™ Plus is not limited to the provision of nominal wall bracing.

Figure 22 gives the design bracing capacity for panels secured with tie down bolts. This table can be considered to be an addition to Table 8.18, AS1684.2 - AS1684.3.

FIGURE 22 //
DURALINER™ PLUS INSTALLATION TO MASONRY WALL DIRECT ADHESIVE FIXING



FASTENER SPACING

When using tie down bolts, fasteners are to be fixed at 150mm max around sheet perimeter and 200mm max in the body of the sheet.

STUD CENTRE (mm)	CLADDING	BRACING CAPACITY (k/N/m)ULS*
600	One Face Only	2.40
450	One Face Only	2.70
600	Both Faces	3.40+
450	Both Faces	3.80+

*Ultimate Limit State design.

These results are from testing on JD5 Grade timber. If hardwood frames (JD2) are used, the ULS will increase by 12.5%.

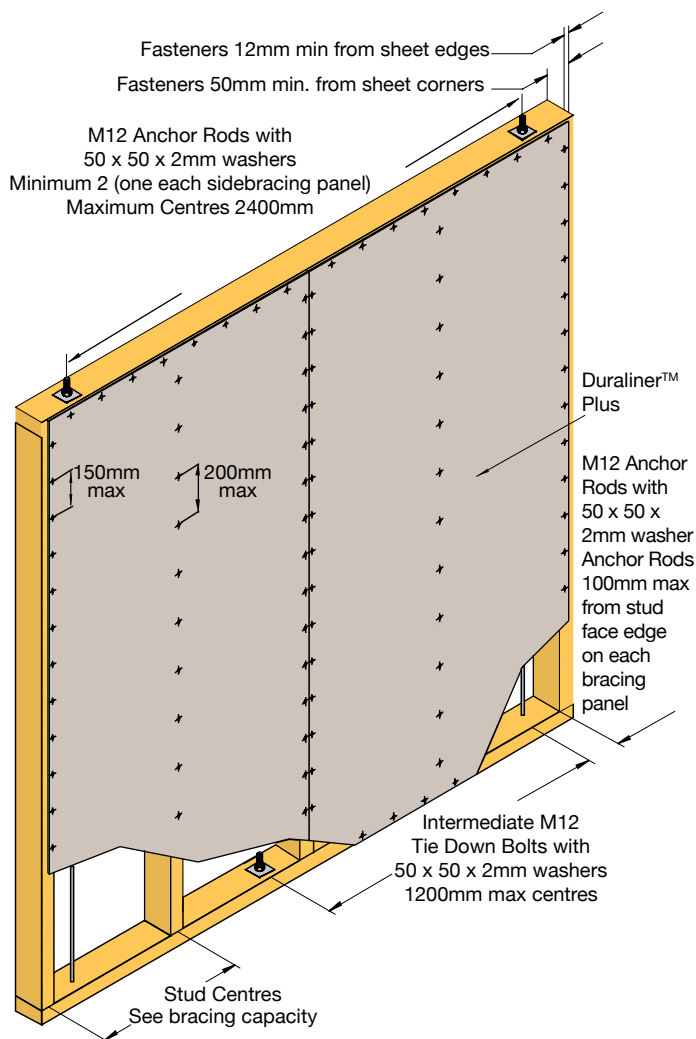
Permissible Stress Design (PSD) = $\frac{\text{Ultimate Limit State (ULS)}}{1.5}$

+Calculated through interpolation.

BRACING

Figure 23 gives the design bracing capacity for panels secured with anchor rods. This table can be considered to be an addition to Table 8.18, AS1684.2 AS1684.3.

FIGURE 23 // DURALINER™ PLUS BRACING CAPACITY USING ANCHOR RODS



PANELS HEIGHT GREATER THAN 2700mm

The bracing capabilities, Figures 22 and 23 are applicable to a maximum panel height of 2700mm.

For panel heights greater than 2700mm the bracing capacity shall be reduced using the panel height multiplier given in the below table.

BRACING CAPACITY - PANEL HEIGHT MULTIPLIER

WALL HEIGHT (MM)	MULTIPLIER
3000	0.90
3300	0.80
3600	0.75
3900	0.70
4200	0.64

PANELS LENGTH LESS THAN 900mm

The bracing capabilities, Figures 22 and 23 are applicable to a minimum panel length of 900mm. Effective bracing is achievable with panel lengths down to 450mm. Reduce the bracing capacity for panel between 450mm and 900mm long, using panel length multiplier given in the table below.

BRACING CAPACITY - PANEL HEIGHT MULTIPLIER

PANEL LENGTH (MM)	MULTIPLIER
850	0.92
800	0.83
750	0.75
700	0.66
650	0.58
600	0.50
550	0.42
500	0.33
450	0.25

FASTENER SPACING

When using Anchor Rods, fasteners are to be fixed at 150mm max around sheet perimeter and 200mm max in the body of the sheet.

STUD CENTRE (mm)	CLADDING	BRACING CAPACITY (k/N/m)ULS*
600	One Face Only	4.95
600	Both Faces	5.10

*Ultimate Limit State design.

These results are from testing on JD5 Grade timber. If hardwood frames (JD2) are used, the ULS will increase by 12.5%.

Permissible Stress Design (PSD) = $\frac{\text{Ultimate Limit State (ULS)}}{1.5}$

A soffit is defined as an external ceiling under roof or other decking structures with limited space above. Eaves and verandahs are usually narrower and are at the perimeter of the building.

A current trend is to design a seamless flushed finish to external soffits to complement the flushed finish on internal ceilings. The soffit or external ceiling is in an external environment which is subject to weather extremes, wind pressure and significant thermal variation. Thermal variation can result in flush joint cracking. Ambient temperatures affect the dimensional stability of most materials notably steel and to a lesser extent timber. While ambient range can be 0c – plus 40c; unventilated spaces immediately above the soffit are capable of reaching in the vicinity of 70c. Such a large temperature range results in thermal movement primarily in the soffit supporting structure. This movement results in cracking of the flushed joints.

Duraliner™ Plus can be flushed with BGC exterior base and topping compounds. However, this system must incorporate control joints as per our details attached. While this system achieves a seamless appearance, apart from the control joints, it is not recommended in applications where higher levels of thermal variation are likely to occur in the space immediately above the soffit.

Duralux™ Plus on the other hand offers crisp lines by expressing every joint. This detail eliminates the risk of flush joint cracking and is the preferred option. The decision to specify a flush jointed external soffit in Duraliner™ Plus needs careful consideration of the immediate environment of the soffit lining. As a general rule, soffits where the space above is less than 1m should not be flush jointed. Should the designer/specifier or others want a flushed finish in tighter spaces very careful detailing to address heat build-up and thermal movement is required; regardless cracked joints are a real risk.

The following suggestions cover most of the key issues to be considered in minimising the risk of flushed joint failure. Please note these suggestions do not eliminate the possibility of cracked joints. Refer to figures 25 to 31 on the following pages.

ENSURE YOU CONSIDER:

- // Engineered frame providing for imposed wind load, control joints, thermal movement and ventilation. Typically Rondo and/or Peer can provide this information
- // A minimum space of 1m above the soffit. Ventilate the space to minimise heat build-up. A few suggestions are ventilation slots cut in the perimeter of the sheet, install thermal vents in the sheet, roof whirly birds or all of these.
- // Roof insulation is fitted; Anticon or similar.
- // Consider orientation and prolonged exposure to extreme radiant heat in summer as this can cause localised heat build-up and excessive thermal movement.
- // Install Duraliner™ Plus to furring channel typically Rondo 129 and ensure a minimum 35mm bearing area. Furring channel is to be fixed via a suitable clip or suspension system. Sheets are orientated at right angles to furring channel. Do not fix sheets directly to the underside of the roof framing or structure above.
- // Reduce control joint centre to 3.6m i.e. two flushed joint between control joints to better cater for thermal movement and or use expressed joints.
- // Use minimum class 3 corrosion resistant fasteners. Corrosive atmospheres i.e. industrial locations and coastal or estuary locations with airborne salt spray will require class 4 corrosion resistant fasteners.
- // Flush Duraliner™ Plus joints with BGC Exterior and Wet Area Base Coat and BGC Exterior and Wet Area Top Coat. Refer to application instructions on the buckets and the attached data sheet.
- // Paint the surface with quality exterior grade paints that adhere to the paint manufacturers' recommendation. The paint system should consist of a suitable sealer and two top coats.

The above points are not a guarantee to eliminate cracking of flush joints

FIGURE 24 //
DURALINER™ PLUS MOVEMENT CONTROL BAY
LAYOUT CONFIGURATION FOR FLUSH JOINT SOFFITS

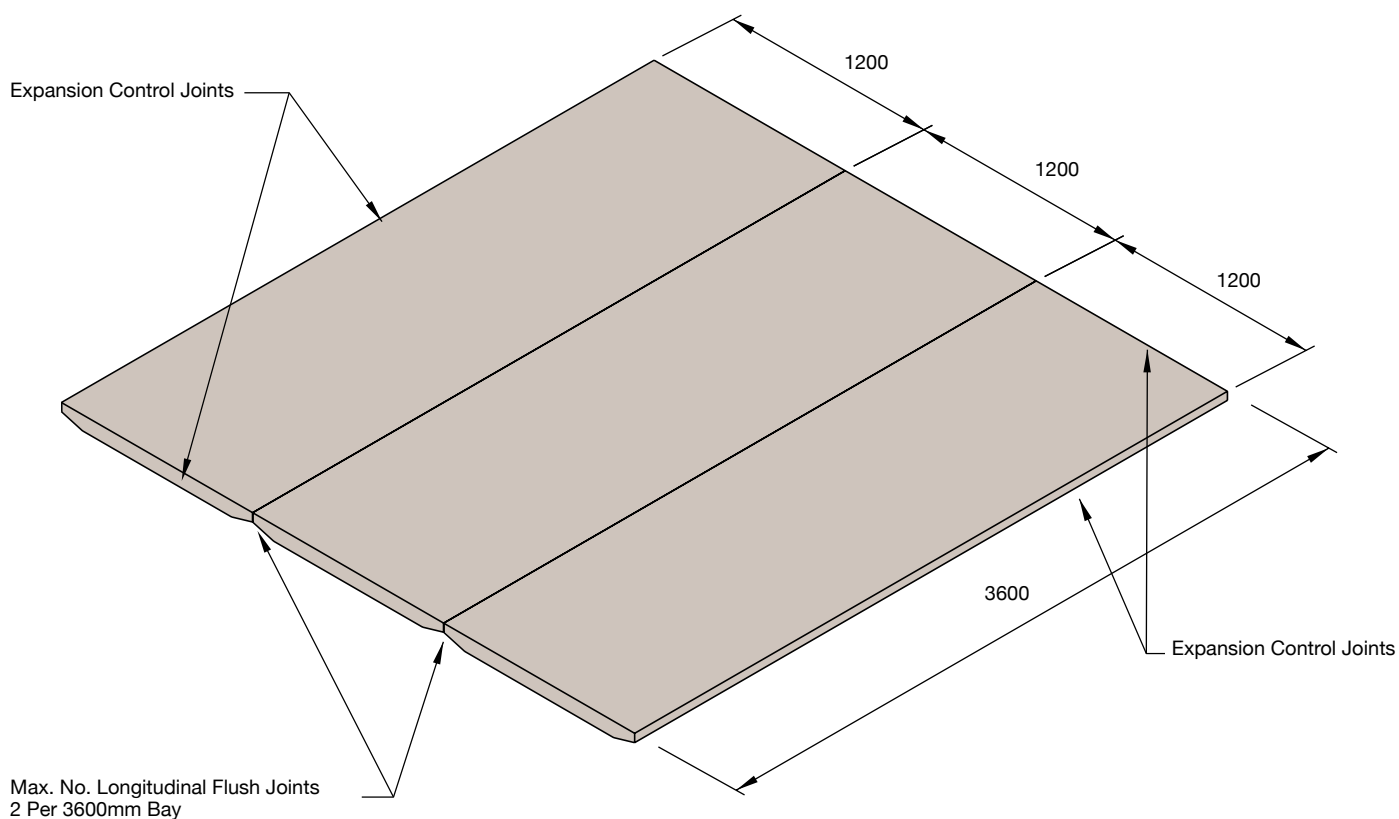


FIGURE 25 //
CONTROL JOINT
PARALLEL TO FURRING CHANNEL

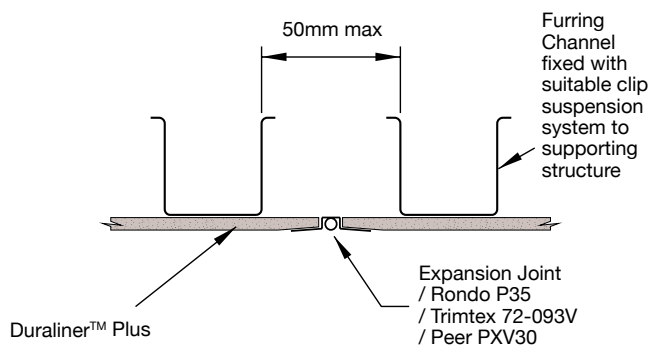


FIGURE 26 //
CONTROL JOINT
PERPENDICULAR TO FURRING CHANNEL

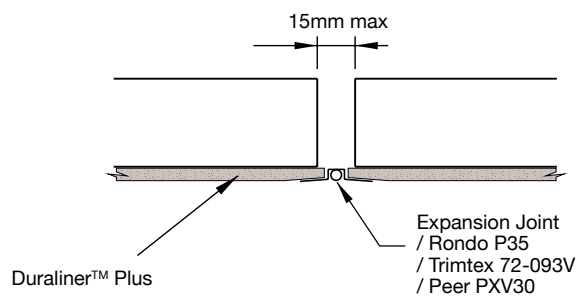


FIGURE 27 //
STEEL WITH FURRING CHANNEL JOINER

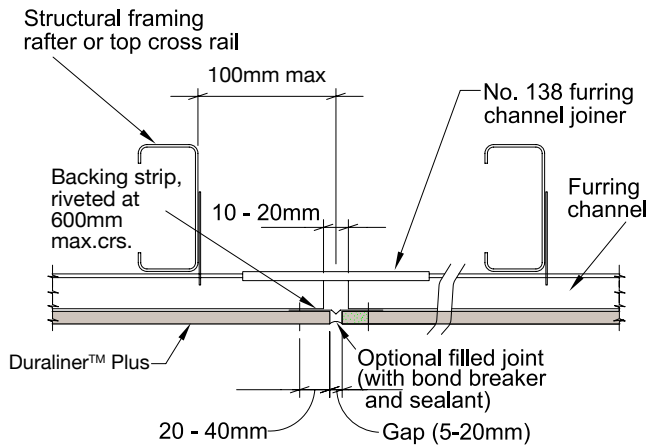


FIGURE 29 //
STEEL AND TIMBER

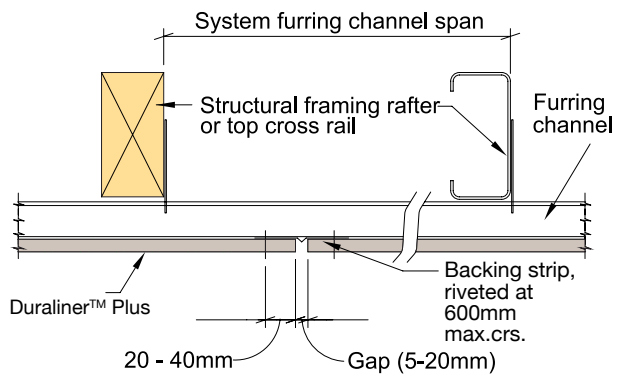


FIGURE 28 //
BACKING STRIP FIXED WITH POLYURETHANE

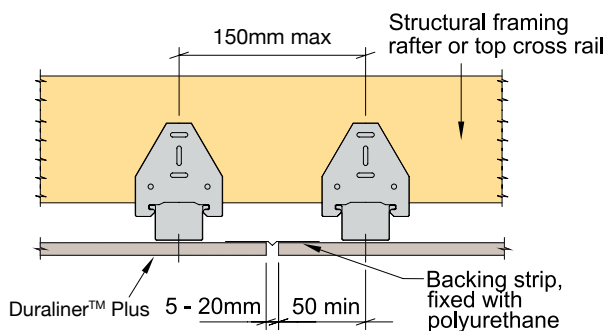
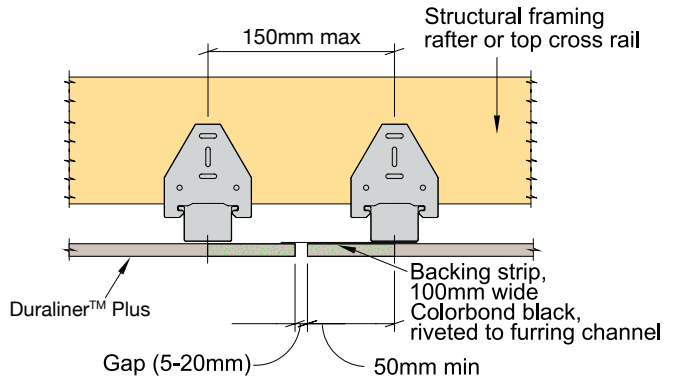


FIGURE 30 //
BACKING STRIP RIVETED



CERAMIC TILING

Duraliner™ Plus sheets used as a substrate for ceramic tiles must be fixed to the framing with either screws or nails (adhesive fixing of sheeting is not acceptable for tiled applications). Framing must support all sheet edges.

For fixing of tiles follow the tile manufacturer's instructions. BGC recommends the use of a flexible tile adhesive complying with Part 1 of Australian Standard AS 2358 "Adhesives - For Fixing Ceramic Tiles". In some tropical regions flexible adhesives may not be suitable – check with tile merchant or adhesive manufacturer for recommendations.

LIGHTING

It is important to understand how the overall wall or ceiling appearance is affected by glancing light (light that shines obliquely across the surface of the wall or ceiling) and the choice of decoration.

Lighting design is very much a matter of cause and effect. Refer to Australian Standard AS2589 for further details on six levels of finish. It is recommended designers give consideration to the level of finish required and eliminate potential problems due to critical lighting.

PAINTING

BGC recommends that at least two coats of paint be applied. The choice of decoration is dependent upon the level of finish required. The paint manufacturer's recommendation on application and maintenance of the paint system must be followed.

MAINTENANCE

Duraliner™ Plus, when used in accordance with this literature, requires no direct maintenance. However in wet areas, regular checks (at least annually) must be made of the tiling system to ensure it remains watertight. Any cracked or damaged tiles, tile grout, or sealants must be replaced or repaired immediately as for new work. Any grout or sealant likely to allow leakage must be raked out and restored to original condition.

Damaged sheets should be replaced as originally installed as for new work.

WIND LOADING

The following supportive information is to assist in the design and fixing 6mm Duraliner™ Plus in high wind areas.

Prior to fixing sheets in place, ensure that the supporting structural systems comply with the BCA and have been certified by a professional engineer.

DESIGN TO AS 4055-1992

AS 4055-1992 is applicable for residential applications and the tabulated data is suitable for both timber and lightweight CFS steel framing systems.

WARRANTY

We warrant that our products are free from defects caused by faulty manufacture or materials for a period of 15 years from the date of purchase. If you acquire any defective products, we will repair or replace them, supply equivalent replacement products or refund the purchase price within 30 days of receiving a valid claim subject to product inspection and confirmation of the existence of a defect by BGC. We will bear the cost of any such repair, replacement or refund.

THIS WARRANTY IS GIVEN BY

BGC Fibre Cement Pty Ltd
121 Bannister Rd Canning Vale WA 6155
Phone 08 9334 4900 Fax 08 9334 4749

To claim under this warranty, you must provide proof of purchase as a consumer and make a written claim (including any costs of claiming) to us at the address specified above within 30 days after the defect was reasonably apparent, or if the defect was reasonably apparent prior to installation, the claim must be made prior to installation. You may not claim under this warranty for loss or damage caused by:

- // faulty or incorrect installation by non-BGC installers (BGC's installation procedures are at bgcinnovadesign.com.au);
- // failure to comply with the Building Code of Australia or any applicable legislation, regulations approvals and standards;
- // products not made or supplied by BGC;
- // abnormal use of the product; or
- // normal wear and tear.

The benefits available under this warranty are in addition to other rights and remedies of the consumer under the law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

TO CONTACT
YOUR NEAREST
BGC STOCKIST,
PLEASE CALL:

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FACSIMILE 08 8258 2612

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TECHNICAL HELP LINE

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BGC FIBRE CEMENT IS A PROUD AUSTRALIAN OWNED MANUFACTURER OF FIBRE CEMENT PRODUCTS.

BGC FIBRE CEMENT PROVIDES BUILDERS, DEVELOPERS AND ARCHITECTS WITH A RANGE OF DESIGN ALTERNATIVES AND INNOVATIVE PRODUCTS, SUCH AS:

EXTERIOR PRODUCTS AND APPLICATIONS INNOVA RANGE OF PRODUCTS

DURACOM™ / A compressed fibre cement facade system.

DURAFLOOR™ / Is the ultimate flooring product that can be used in both interior and exterior applications.

DURAGRID™ RESIDENTIAL & DURAGRID™ LIGHT COMMERCIAL / A lightweight facade giving a modern and durable finish.

DURAGROOVE™ / A vertically grooved exterior facade panel.

DURASCAPE™ / A lightweight exterior facade base sheet with a subtle vertical shadow line.

NULINET™ PLUS / A weatherboard style cladding system.

STONESHEET™ / Purpose designed substrate for stone tile facade.

STRATUM™ / Is a trio of plank products, each of which can be used as stand alone products or used together to create a striking exterior cladding solution.

INTERIOR PRODUCTS AND APPLICATIONS BGC FIBRE CEMENT RANGE OF PRODUCTS

DURALUX™ PLUS / An interior lining board suitable for ceilings and soffits.

DURALINER™ PLUS / An interior lining board, this is the perfect substrate for tiles and is ideal for wet areas.

CERAMIC TILE UNDERLAY / A substrate for ceramic and slate floor tiles.

VINYL CORK FLOOR COVERINGS /
A substrate for vinyl floors.

EXTERIOR PRODUCTS AND APPLICATIONS BGC FIBRE CEMENT RANGE OF PRODUCTS

DURASHEET™ / Ideal for the cladding of gables and lining of eaves. Can also be used on commercial soffits and cladding on non-impact areas.

DURAPLANK™ / Available in Smooth, Woodgrain and Rusticated finishes, Duraplank™ is ideal for exterior cladding of upper storey conversions or ground level extensions.

DURATEX™ / A base sheet used for textured coatings on exterior wall applications.

DURALATTICE™ / Square or diamond patterned lattice, suitable for screens, pergolas and fences.

COMPRESSED / Used for domestic, commercial sheet for wet areas, flooring, partitions, exterior decking, fascia and facade cladding.

DURALUX™ PLUS / Suitable for exterior applications where it will be sheltered from direct weather.

DURALINER™ PLUS / Suitable for exterior applications where it will be sheltered from direct weather.



Build it better with BGC



Fibre Cement

Safe working practices - Please wear a P1 or P2 mask and safety goggles (approved to AS/NZW1337 standards) whilst cutting or installing Duraliner™ Plus. Duraliner™ Plus can be safely handled during unloading or stacking without the use of these precautions.

Cleaning up - Always wet down your work area when cutting Duraliner™ Plus, to ensure that dust is managed. Dispose of any vacuumed dust with care and using containment procedures.

Design by **The SHAPE Group** www.theshapegroup.com.au