



Installation Guide

Villaboard™ Lining

INTERIORS

Australia May 2019

Make sure your information is up to date.

When specifying or installing James Hardie™ products, ensure that you have the current technical information and guides. If in doubt, or you need more information, visit www.jameshardie.com.au or Ask James Hardie™ on 13 11 03.

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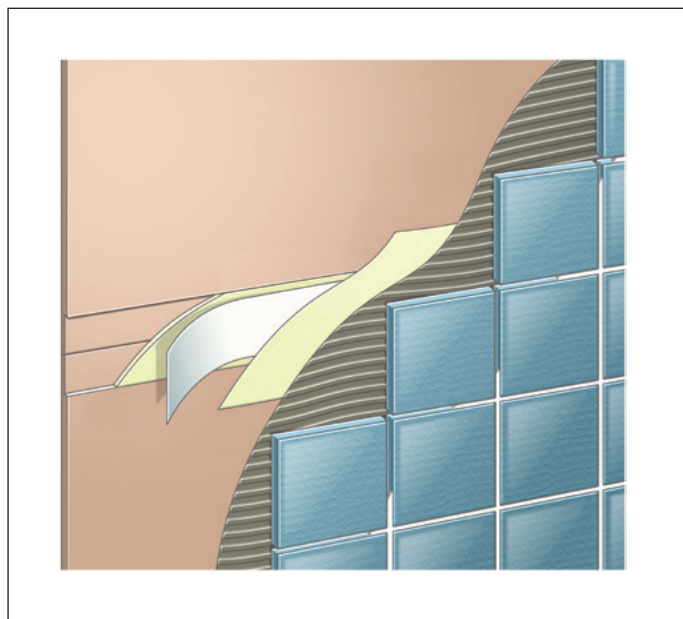
1 INTRODUCTION

Villaboard™ lining is a premium sanded fibre cement sheet with recessed edges for flush jointing. Villaboard™ lining is an ideal internal lining for bathrooms, laundries, kitchens and high traffic abuse areas. It is not suitable as an external wall cladding.

6mm - Residential applications
9mm - Commercial applications
12mm - Heavy duty applications

Main features:

- Durable wet area lining sheet.
- Creates suitable surface for tiles or paint.
- Long edges recessed for easy flush-jointing.
- Reliable impact resistant lining. Ideal for wall lining in commercial applications where walls are prone to damage.
- Suitable for use in fire and acoustically rated systems.



This guide covers the use of Villaboard™ lining in internal wall and ceiling applications. Further technical literature relating to Villaboard™ lining is available from James Hardie in the following documents:

- Eaves and Soffits Technical Specification.
- Wet Area Construction Design Manual.
- Fire and Acoustically Rated Walls Technical Manuals.

The specifier or other responsible party for the project must ensure the information and details in this guide are appropriate for the intended application and that specific design and detailing is undertaken for areas which fall outside the scope of this documentation.

TABLE 1 VILLABOARD™ LINING SHEET SIZES

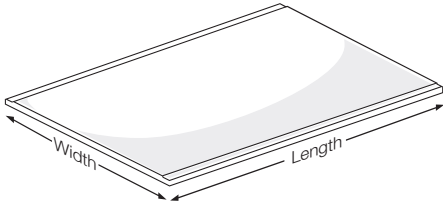


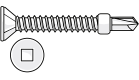

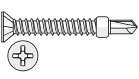

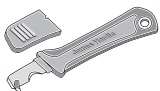

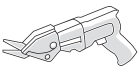












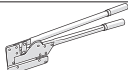

PRODUCTS	LENGTH	WIDTH		
		900	1200	1350
<p>Smooth recessed edge fibre cement internal lining sheet for tiled and untiled applications. Recommended applications are:</p> <p>6mm - Residential applications 9mm - Commercial applications 12mm - Heavy duty applications</p> 	6mm thickness			
	1800		✓	
	2400	✓	✓	✓
	2700		✓	
	3000	✓	✓	✓
	3600		✓	✓
	4200		✓	✓
	9mm thickness			
	2400		✓	
	2700		✓	
	3000		✓	✓
	3600		✓	
	12mm thickness			
	3000		✓	

TABLE 2 PRODUCT / ACCESSORIES / TOOLS
COMPONENTS SUPPLIED BY JAMES HARDIE

PRODUCT	DESCRIPTION	PRODUCT	DESCRIPTION
	HardieBlade™ Saw Blade. 185mm diameter A poly-diamond blade for fast and clean cutting of James Hardie™ fibre cement. Bore diameter is 20mm. 1 each. Part No. 300660		James Hardie™ Base Coat 4kg tub A water resistant base coat compound used in conjunction with James Hardie™ Top Coat to create a seamless flush joint for Villaboard™ lining. 4 per box. Part No. 305535
	HardieDrive™ Screw 25mm long A class 3 self-tapping wing-tipped screw for fastening to 0.5mm to 1.6mm BMT light gauge steel frames. 1000 per box. Part No. 305979		James Hardie™ Base Coat 15kg bag A water resistant base coat compound used in conjunction with James Hardie™ Top Coat to create a seamless flush joint for Villaboard™ lining. 1 each. Part No. 304491
	HardieDrive™ Collated Screw 25mm long A class 3 self-tapping wing-tipped screw for fastening to 0.5mm to 1.6mm BMT light gauge steel frames. Suitable for use in most auto feed screw guns. 1000 per box. Part No. 305980		James Hardie™ Top Coat 15kg tub A water resistant top coat compound used in conjunction with James Hardie™ Base Coat to create a seamless flush joint for Villaboard™ lining. 1 each. Part No. 304493
	Villaboard™ Knife A score and snap knife designed to efficiently cut through fibre cement sheets ≤9mm thick. 12 per box. Part No. 305915.		James Hardie™ Top Coat 3kg tub A water resistant top coat compound used in conjunction with James Hardie™ Base Coat to create a seamless flush joint for Villaboard™ lining. 1 each. Part No. 305536
	James Hardie™ Fibreshear Electric tool for cutting fibre cement sheets. 1 each. Part No. 300653		James Hardie™ Joint Sealant 300mL cartridge A general purpose, paintable, exterior grade polyurethane joint sealant. 20 per box. Part No. 305534

COMPONENTS SUPPLIED BY JAMES HARDIE

James Hardie recommends the following products for use in conjunction with its Villaboard™ lining. James Hardie does not supply these products and does not provide a warranty for their use. Please contact the component manufacturer for information on their warranties and further information on their products.

ACCESSORIES	DESCRIPTION	ACCESSORIES	DESCRIPTION
	Galvanised fibre cement nails For 6 & 9mm Villaboard™ lining use 30mm x 2.8		Broadknife For setting of joints on Villaboard™ lining.
	Galvanised fibre cement nails For 12mm Villaboard™ lining use 40mm x 2.8mm fibre cement nails.		Second coat trowel 200mm For installing second coats on set joints.
	Backing rod Backing to sealant in movement joints.		Finishing coat trowel For installing top coats on set joints.
	Stud adhesive For fastener/adhesive fixing to timber and steel studs. Must be suitable for fibre cement.		Hawk To assist in the application of finishing compounds especially with the use of trowels.
	Perforated paper tape Joint reinforcing tape.		Corner tool For setting of internal corners.
	Level/straight edge For checking straightness of frame.		Hand sander For sanding set joints.
	Hand guillotine Guillotine for cutting fibre cement.		Notched trowel For applying tile adhesive to face of Villaboard™ lining.

2 SAFE WORKING PRACTICES

WARNING - DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

James Hardie™ products contain sand, a source of respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'score and snap' knife, fibre cement shears or, where not feasible, use a HardieBlade™ saw blade (or equivalent) and dust-reducing circular saw attached to an appropriate, well maintained, filtered vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up use a vacuum and filter, both of which are well maintained and appropriate for capturing fine (respirable) dust. Alternatively, use wet clean-up methods - never dry sweep. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.com.au. FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

JAMES HARDIE RECOMMENDED SAFE WORKING PRACTICES

CUTTING OUTDOORS

1. Position cutting station so wind will blow dust away from the user or others in working area.
2. Use one of the following methods based on the required cutting rate:
 - Best** ■ Score and snap ■ Hand guillotine ■ Fibreshear
 - Better** ■ Position the cutting station in a well-ventilated area. Use a dust reducing circular saw equipped with HardieBlade™ Saw Blade or comparable fibre cement blade and well maintained vacuum and filter appropriate for capturing fine (respirable) dust.

CUTTING INDOORS

- Cut only using score and snap, hand guillotine or fibreshears (manual, electric or pneumatic).
- Position cutting station in a well-ventilated area.

REBATING/SANDING/DRILLING/OTHER MACHINING

When rebating, sanding, drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES

1. For maximum protection (lowest respirable dust production) James Hardie recommends always using best practice cutting methods where feasible.
2. NEVER use a power saw indoors.
3. ALWAYS use a circular saw blade that carries the HardieBlade™ logo or is of at least comparable performance.
4. NEVER dry sweep - use wet suppression or appropriate vacuum and filter.
5. NEVER use grinders.
6. ALWAYS follow tool manufacturer's safety recommendations.

DUST MASKS AND RESPIRATORS

James Hardie recommends the use of P2 respirators as best practice. As a minimum, an AS/NZS1716 P1 respirator must be used when doing any activity that may create dust. For more extensive guidance and options for selecting respirators for workplaces please refer to Australian/New Zealand Standard 1715:2009 "Selection, Use and Maintenance of Respiratory Protective Equipment".

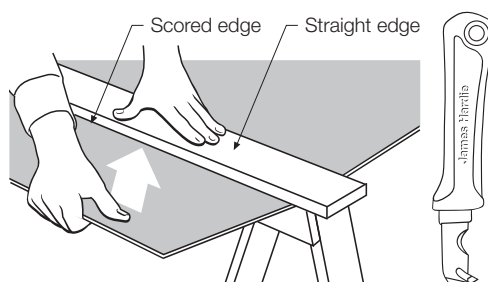
P1 or P2 respirators should be used in conjunction with the above cutting practices to minimise dust exposure. For further information, refer to Safety Data Sheet (SDS) available at www.jameshardie.com.au. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

WORKING INSTRUCTIONS

Refer to recommended safe working practices before starting any cutting or machining of product.

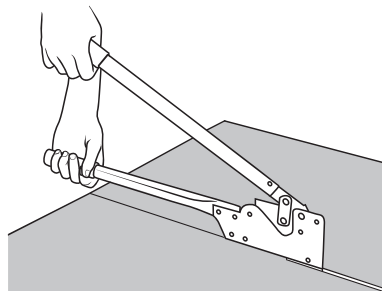
Score and snap

Score and snap is a fast and efficient method of cutting James Hardie™ building products using James Hardie's Villaboard™ knife. Preferably score on the face side of the product. Score against a straight edge and repeat the action to obtain adequate depth for clean break – normally one third of sheet thickness. Snap upwards to achieve break. Smooth any rough edges with a rasp.



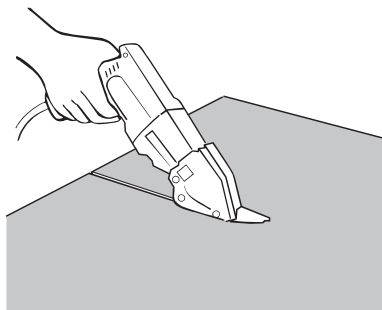
Hand guillotine

Make guillotine cut on the off-cut side of line to allow for the thickness of the blade.



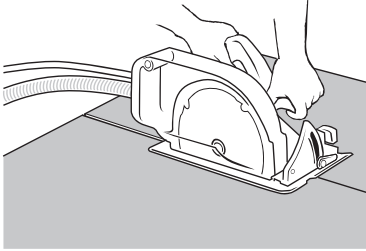
Fibreshear

An electrically powered, fast, clean and effortless way of cutting James Hardie building products, especially around curves such as archways. Make fibreshear cut on the 'off-cut' side of the line to allow for the thickness of the shear.



HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw and HEPA vacuum extraction allows for fast, clean cutting of James Hardie™ fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector which can be connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



STORAGE AND HANDLING

To avoid damage, all James Hardie™ building products should be stored with edges and corners of the sheets protected from chipping.

James Hardie™ building products must be installed in a dry state and protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water, moisture, etc.

QUALITY

James Hardie conducts stringent quality checks to ensure any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

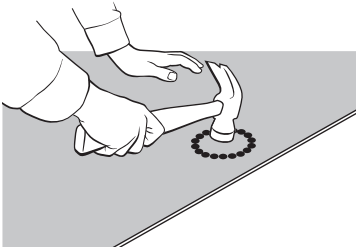
HOLE-FORMING

For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet.
- Pre-drill a pilot hole.
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill.

For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face.
- Tap carefully to avoid damage to sheets, ensuring the sheet edges are properly supported.



3 FRAMING / SUBSTRATE

GENERAL

Villaboard™ lining can be fixed to either timber framing, light gauge domestic type steel framing and masonry, concrete or Autoclaved Aerated Concrete. (AAC) substrates. The framing and substrate used must comply with the relevant building regulations and standards and the requirements of this guide.

NOTE

Stud spacings restrict the thickness of tiles used to finish Villaboard™ lining. For more information refer to the Finishes and Maintenance section on page 16.

At deflection head junctions, do not fix Villaboard™ lining to the deflection head track.

TIMBER

Use only seasoned timber. Unseasoned timber must not be used as it is prone to shrinkage and can cause Villaboard™ lining and frames to move. Studs must not be less than 38mm wide at joints.

'Timber used for house construction must have the level of durability appropriate for the relevant climate, expected service life and conditions including exposure to insect attacks or to moisture, which could cause decay.'

Reference AS1684.2 - 2010 'Residential Timber Framed Construction'.

STEEL

The minimum size for steel stud framing should be 64mm deep x 0.55mm base metal thickness (BMT).

Steel framing must be designed in accordance with AS/NZS 4600 'Cold Formed Steel Structures'.

Steel sections shall be galvanised or zinc coated of 0.55mm - 1.6mm Base Metal Thickness (BMT). Studs must not be less than 38mm wide at joints.

MASONRY/CONCRETE/AAC

Always ensure the substrate is given adequate time to dry out before installation of Villaboard™ lining. The wall surface must be clean, dry and free of any material that will reduce an effective bond (e.g. dust, loose paint, oil, drummy render, waterproofing or other agents, etc).

Chase walls, install services and secure to wall prior to fixing Villaboard™ lining.

FRAME TOLERANCES

Ensure frame is square and work from a central datum line. Frames must be straight and true to provide a flush face to receive the sheeting.



FIGURE 1 FRAME STRAIGHTNESS

A suggested maximum tolerance of between 3mm and 4mm in any 3000mm length of frame will give best results. Villaboard™ lining will not straighten excessively warped or distorted frames and any warping may still be visible after the internal lining is applied.

MASONRY/CONCRETE/AAC TOLERANCES

Cut Villaboard™ lining approximately 15mm less than floor to ceiling height to allow for building tolerances. Ensure a 5-10mm building tolerance gap is provided at the floor and ceiling junctions with the Villaboard™ lining. See Page 10 for specific substrate requirements.

CURVED WALLS

Villaboard™ lining may be bent to accommodate curved walls. The minimum bending radii are shown below.

TABLE 3 CURVED WALL MINIMUM BENDING RADII

	Along length (mm)	Across width (mm)
6mm Villaboard™ lining	1800 (1200)	2400
9mm Villaboard™ lining	3000 (1800)	4000

NOTES

1. The bending radii given above require no special pre-wetting of the sheet and may be used on internal or external curves.
2. With extra care, the sheets can be bent to the values shown in the brackets.

To maintain the smoothness of the curve, studs are generally required at spacings as shown below.

TABLE 4 CURVED LINING – STUD SPACING

RANGE OF RADII (mm)	STUD SPACING
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 the sheet width, whichever is the lesser.

4 SHEET LAYOUT

GENERAL

Install Villaboard™ lining across the framing, i.e. place the long edges of the sheet at right angles to the framing members. Villaboard™ lining can be fixed either horizontally or vertically, however horizontal fixing is recommended as the most convenient method in residential applications.

Sheet joints must coincide with the centre line of the framing member. At door and window openings, fix sheets around the opening so sheet edges do not coincide with the side of the door or window by a minimum distance 200mm. See Figure 2.

In areas that require greater joint performance and where glancing light is not an issue, it is recommended that Villaboard™ lining be installed vertically.

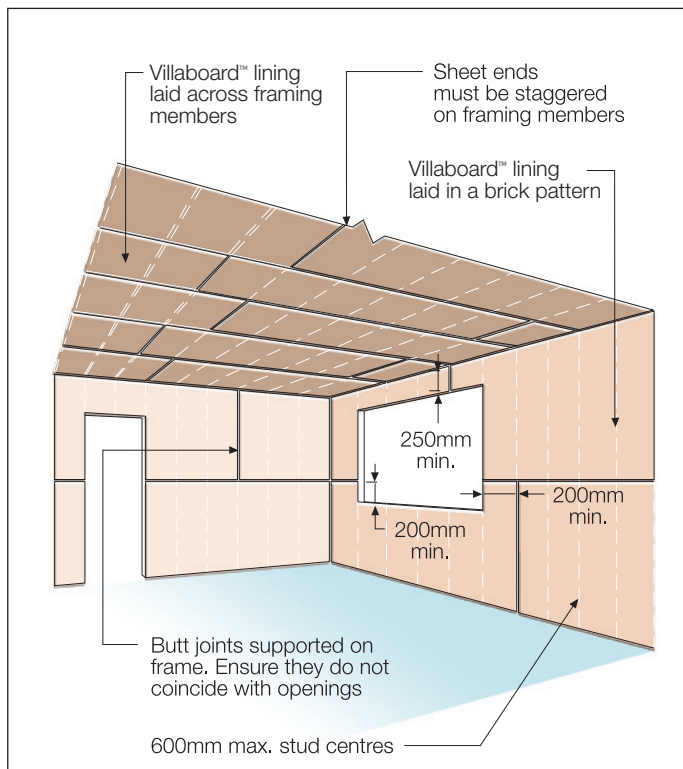


FIGURE 2 SHEET LAYOUT

5 INSTALLATION

GENERAL

- Install sheets after roofing and external cladding have been installed.
- Before setting the Villaboard™ lining sheet joints, ensure that the wall frames are fully loaded and that the sheets have been allowed to adjust to the internal temperature.
- Store Villaboard™ lining sheets and James Hardie™ joint setting compounds undercover and out of the weather.

WARM CLIMATES

In warm climates, ensure you:

1. Dampen all sheet edges with clean cold water before setting of sheet joints
2. Avoid making large amounts of James Hardie™ base coat to prevent the James Hardie™ base coat compound becoming dry
3. Always use clean cold water to mix the James Hardie™ Base Coat

Place 6mm packers along floor as temporary support for sheets. This will allow for any frame movement/shrinkage. Put first sheet in place as shown.



FIGURE 3 FIRST SHEET

Ensuring the sheet is level, fix the first sheet starting from the centre of sheet and working outwards to avoid any drumminess.



FIGURE 4 FIXING FIRST SHEET

Fix remaining sheets in similar sequence.



FIGURE 5 FIXING REMAINING SHEETS

NOTES

1. For fastener selection and spacings see pages 8-11.
2. Do not fix sheets to the bottom chord of roof trusses. Instead, fix to battens or furring channels.

FASTENERS

Fasteners must have the appropriate level of durability required for the intended project.

Fasteners must be fully compatible with all other material that they are in contact with to ensure the durability and integrity of the assembly.

TIMBER FRAME FASTENER SELECTION

6mm & 9mm Villaboard™ lining	30mm x 2.8mm Galvanised FC Nail
------------------------------	---------------------------------

STEEL FRAME FASTENER SELECTION

	0.5mm – 1.6mm BMT
6-12mm Villaboard™ lining	HardieDrive™ screw 25mm

Fasteners should be driven flush as shown in Figure 6. Fasteners should be screwed as close as possible to the stud corners to avoid deflection of the stud flange, see Figure 7.

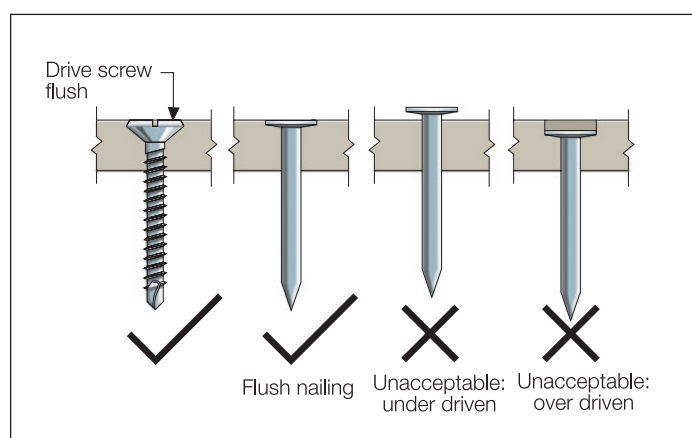


FIGURE 6 FASTENER DEPTH

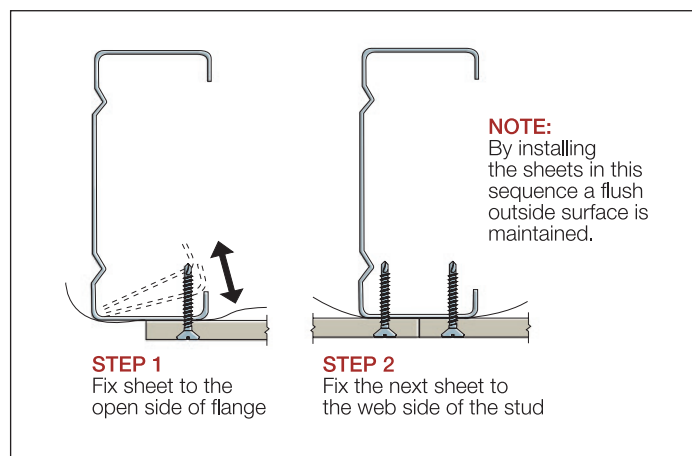


FIGURE 7 SCREW FASTENING

FIXING TO FRAMED WALLS

Untiled walls

Where Villaboard™ lining is to be left untiled, the sheets can be fixed with fasteners or a combination of fasteners and adhesive, see Figures 8-9.

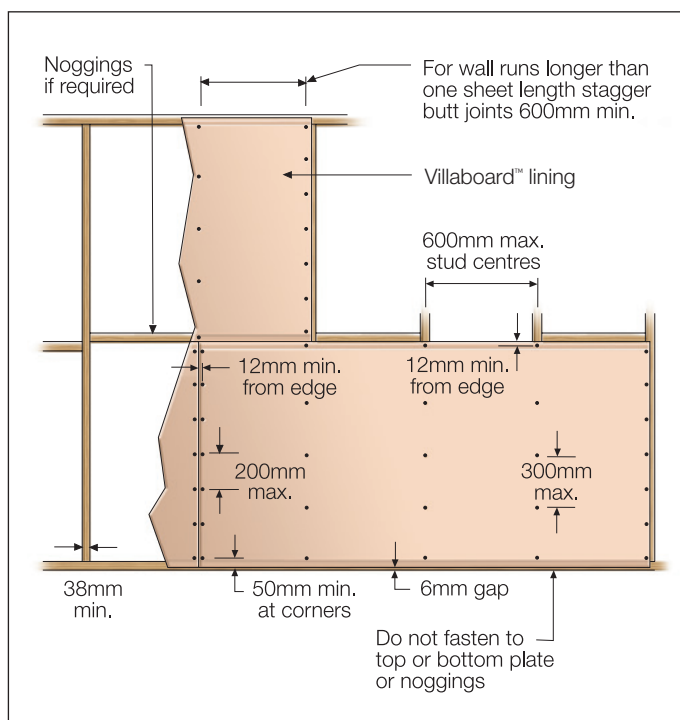


FIGURE 8 UNTILED FASTENING TO WALL FRAMES

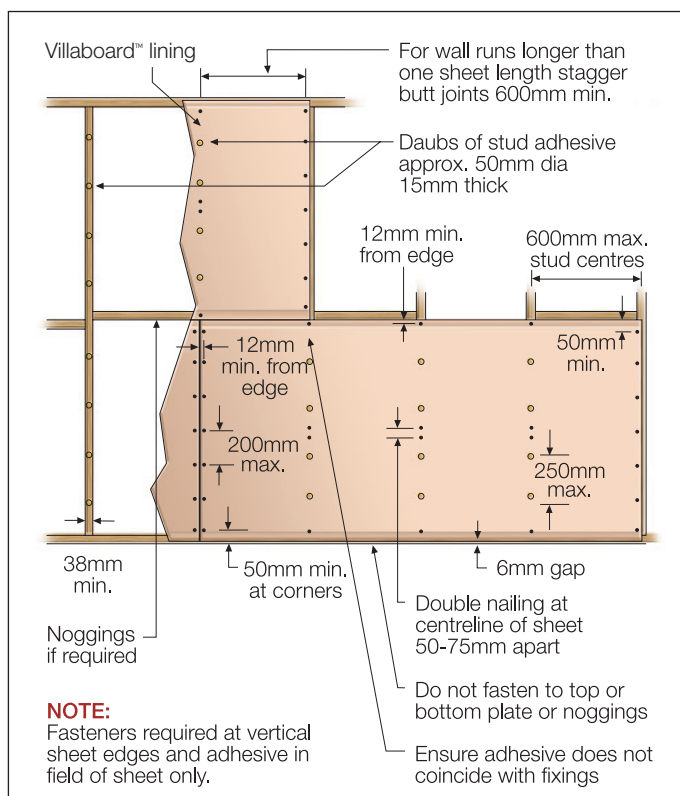


FIGURE 9 FASTENER / ADHESIVE FIXING TO WALL FRAMES

NOTES

1. When installing skirting tiles up to 300mm in height, only fasten the bottom of the sheet to the bottom plate at 200mm maximum centres.
2. All surfaces to receive adhesive must be clean, free of dust, oil, etc.
3. Ensure daubs of adhesive never coincide with permanent fastener points, as adhesive shrinkage may cause fastener head protrusion.
4. When fixing cornices it is recommended that Villaboard™ lining is wetted with a sponge prior to adhesive fixing of cornices.

Tiled walls

Where Villaboard™ lining is to be finished with tiles, the sheets must be fixed with fasteners only as shown in Figure 10.

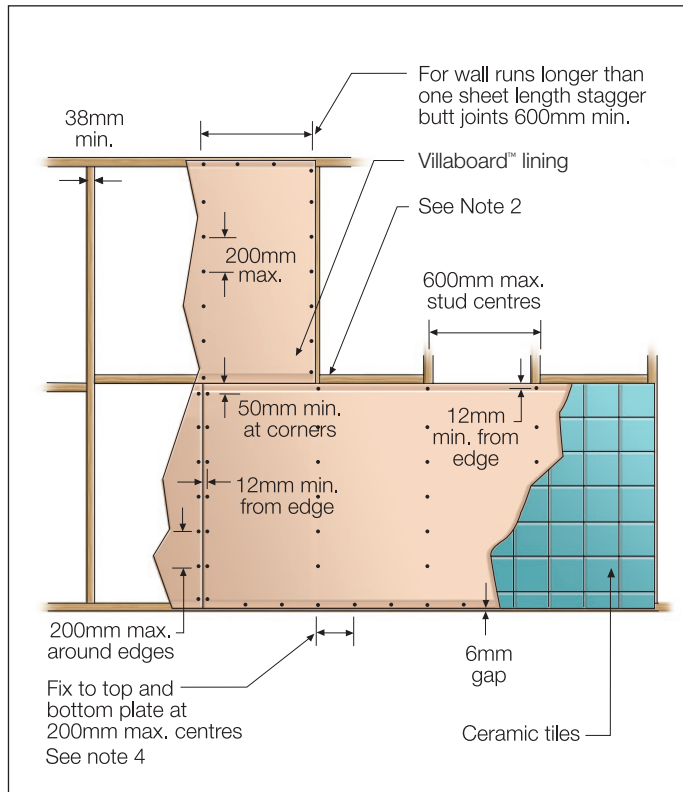


FIGURE 10 TILED FASTENING TO WALL FRAMES

NOTES

1. Where external perimeter flashing is used, additional noggings are required to fix the bottom edge of the Villaboard™ lining. See the Wet Area Construction Design Manual.
2. When noggings are used it is good practice to install the nogging row in-line to enable fixing of abutting sheets, however note that this nogging arrangement is not mandatory (i.e. staggered noggings are allowed).
3. Noggings directly behind recessed sheet edges are recommended where impact is expected eg. hallways in a commercial building.
4. When using steel frames, at deflection heads, do not fix Villaboard™ lining to deflection head track.

FIXING TO FRAMED CEILINGS

For ceiling applications either the fastener or fastener/adhesive method can be used. Refer to Figures 11 and 12 respectively.

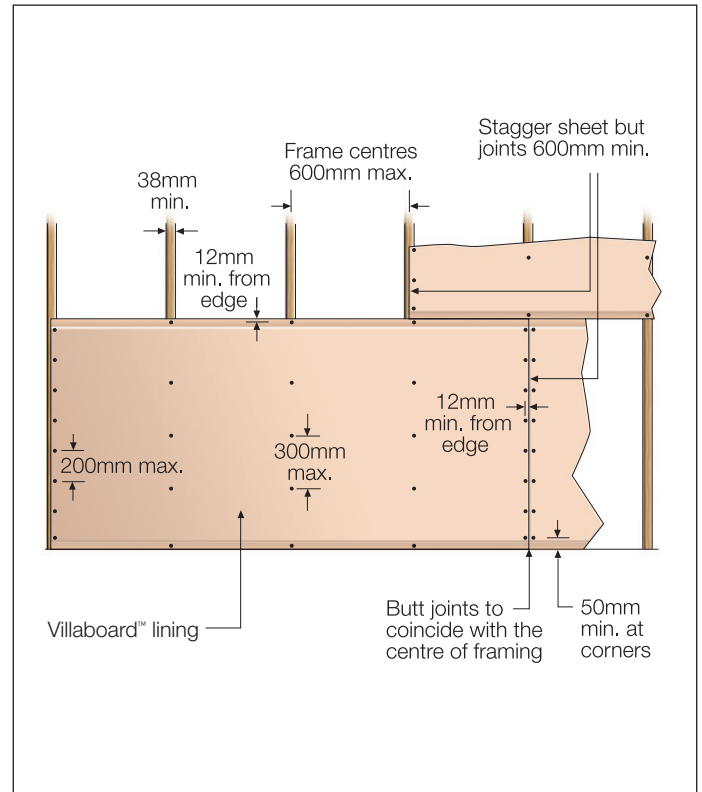


FIGURE 11 FASTENING TO CEILING FRAMES

NOTES

1. Do not install tiles in ceiling applications.
2. Do not fix sheets to the bottom chord of trusses. Batten these out first with timber battens or steel ceiling battens.
3. **Special design considerations must be made when fixing Villaboard™ lining above indoor pools, contact James Hardie on 13 11 03 for more information.**

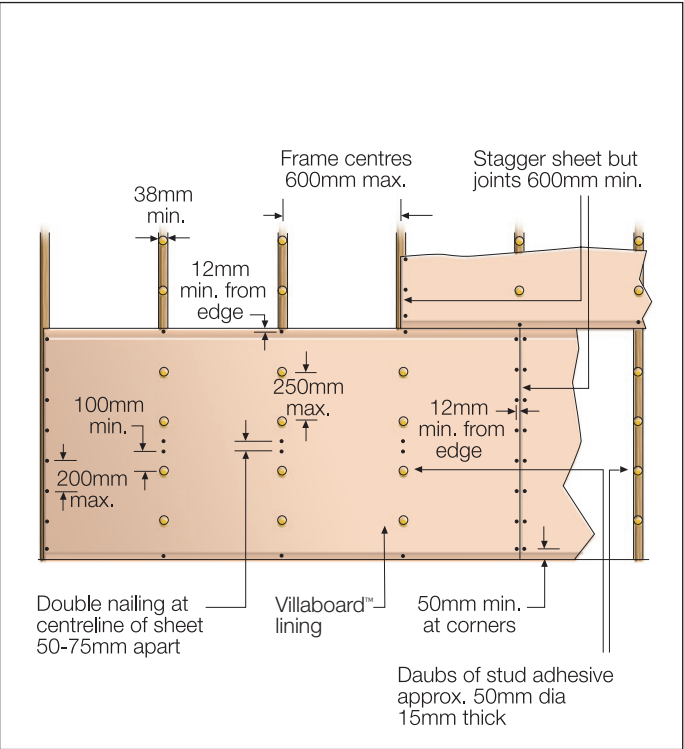


FIGURE 12 FASTENER / ADHESIVE FIXING TO CEILING FRAMES

NOTES

1. Do not use adhesive only. Ensure sheet perimeter is fastened as shown.
2. All surfaces to receive adhesive must be clean, free of dust, oil, etc.
3. Ensure daubs of adhesive never coincide with permanent fastener points, as adhesive shrinkage may cause fastener head protrusion.

FIXING TO MASONRY/CONCRETE/AAC

Villaboard™ lining can be installed over masonry, concrete and Autoclaved Aerated Concrete (AAC) substrates by following the requirements in Table 5 below.

TABLE 5 FIXING METHOD SELECTION		
METHOD	SUBSTRATE	APPLICATION
Batten/furring channels	Masonry/concrete AAC blocks	Tiled/untiled wet/dry areas with flat or uneven substrate
AAC fixing	AAC	Untiled wet/dry areas

BATTEN / FURRING CHANNELS

- NOTE:** Suitable for tiled or untiled applications.
1. Substrate may be uneven and misaligned – allows correction of irregular surfaces; allows packing out to accommodate large surface variations.
 2. Recommended where the existing wall surface is not suitable for adhesive fixing due to flaking paint, drummy render, etc.
 3. Recommended building practice over concrete/block/brick and similar substrates that are prone to cracking & movement.
 4. Timber battens are either fixed directly to the walls, or alternatively, metal furring channel anchor clips can be used. These are attached to the wall prior to fitting the metal furring channels.
 5. Where services are run over walls, deeper furring channels may be used.
 6. Use suitable masonry fasteners to securely fix timber/steel battens or recessed furring channels as shown in figure 13.
 7. Pack behind battens as required to achieve a flat surface.
 8. Support the Villaboard™ lining edges along the top and bottom of the wall.

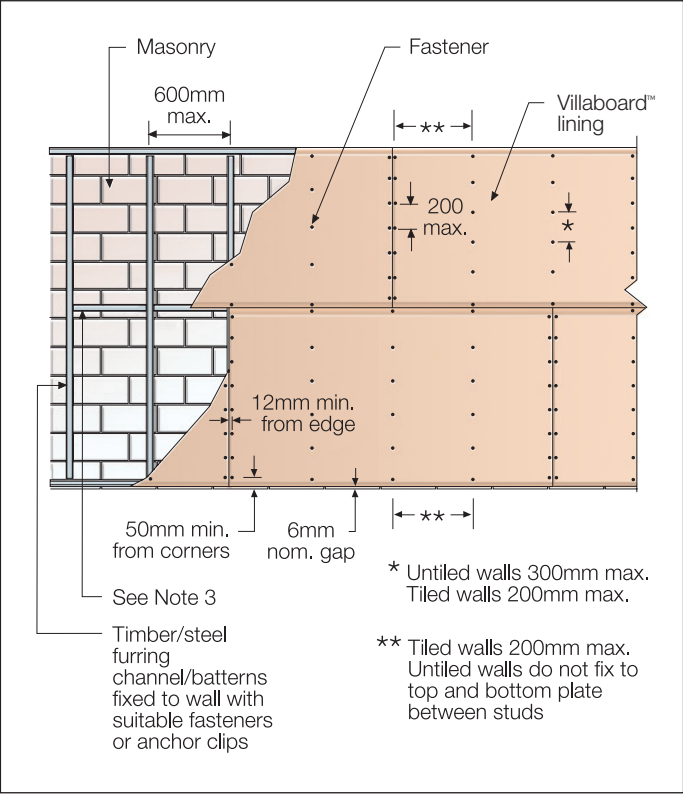


FIGURE 13 BATTEN / FURRING CHANNEL - HORIZONTAL LAYOUT

NOTES

1. Timber battens or proprietary steel battens or furring channel sections may be used. Where space is a major consideration, use recessed furring channels which have the least section depth.
2. The spacing and fixing of anchor clips must be in accordance with the manufacturer's recommendations.
3. Although not mandatory, when noggings are used it is good practice to install the nogging row in-line to enable fixing of abutting sheets.

AUTOCLAVED AERATED CONCRETE (AAC)

NOTE: Not suitable for tiled applications.

1. Chase walls, install and secure services.
2. Install Villaboard™ lining, abutting edges of adjacent sheets.
3. Drive the AAC fasteners through the Villaboard™ lining into the wall until the fastener head is neatly bedded below the Villaboard™ lining surface.
4. Only for standard grade AAC blocks of 500kg per cubic metre density.

NOTE

Use only suitable fasteners recommended by AAC manufacturer for fixing Villaboard™ lining.

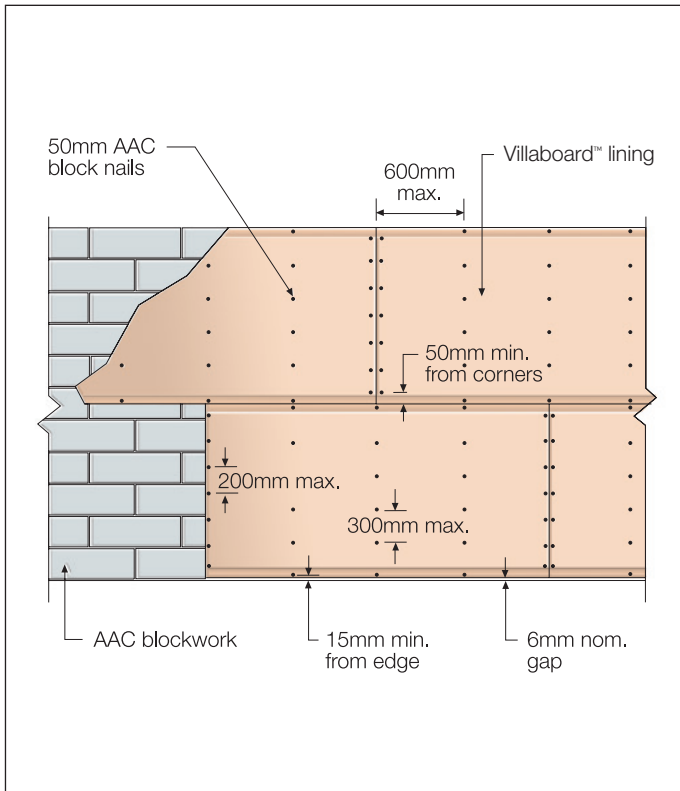


FIGURE 14 AAC - HORIZONTAL LAYOUT

6 JOINTS

GENERAL

Villaboard™ lining joints are set with proprietary jointing compounds reinforced with perforated paper tape. Both recessed edge and butt joints require joint setting by using the jointing products outlined.

The performance of joints is the responsibility of the installer, as this is governed by the installation practices and the standard of workmanship applied. However, James Hardie considers that the recommendations provided in Table 6 describe best practice to reduce the risk of joint cracking or other problems.

There are various factors that can affect the performance of jointing compounds on edge recessed fibre cement substrates. These factors include the framing, movement, installation quality, vibrations, moisture, humidity, temperature, etc. To achieve satisfactory joint performance these factors need to be carefully considered and understood by the installer and designer then positioning joints and selecting jointing compounds. Furthermore, it is important that the jointing compound used has the physical attributes required to perform considering these factors.

James Hardie™ Base Coat has been specifically developed for use with Villaboard™ lining and offer superior joint strength when compared with the gypsum jointing compound alternatives.

In addition, provision for movement needs to be made by the installation of control joints. See Page 15.

Hot Climates

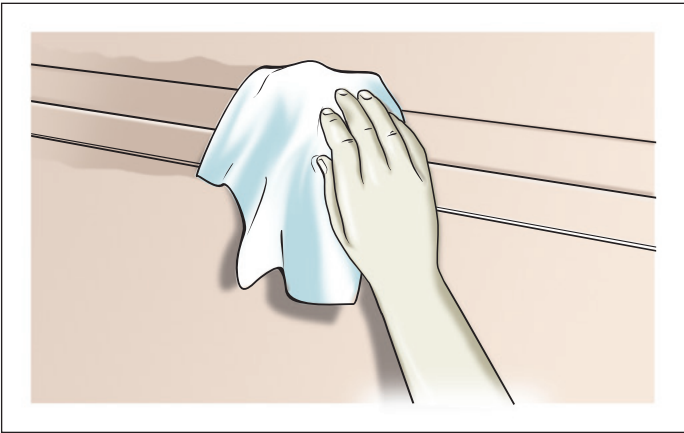
Refer to page 7 for additional recommendations when installing Villaboard™ lining in hot dry climates.

TABLE 6 JOINTING COMPOUND RECOMMENDATIONS			
	APPLICATION	BASE COMPOUND	TOPPING COMPOUND
Dry walls, ceilings and wet areas	Untiled	James Hardie™ Base Coat	James Hardie™ Top Coat
Wet areas	Tiled	James Hardie™ Base Coat	N/A

SET JOINTS

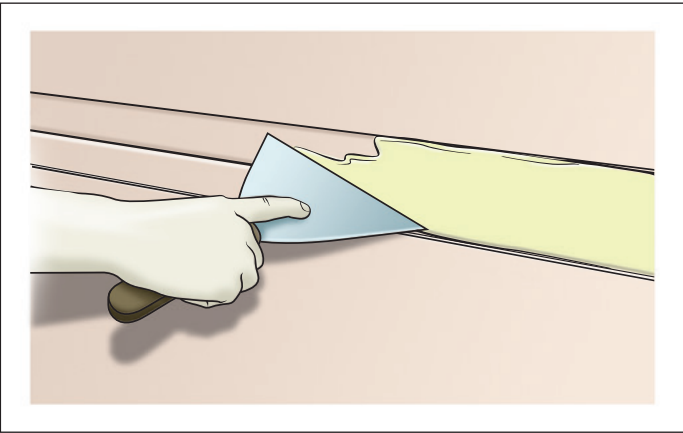
Step 1 - Preparation

Ensure that the recesses are clean and free of dust and contaminants. If working conditions are warm and dry, dampen the area around the joint prior to working with clean cold water.



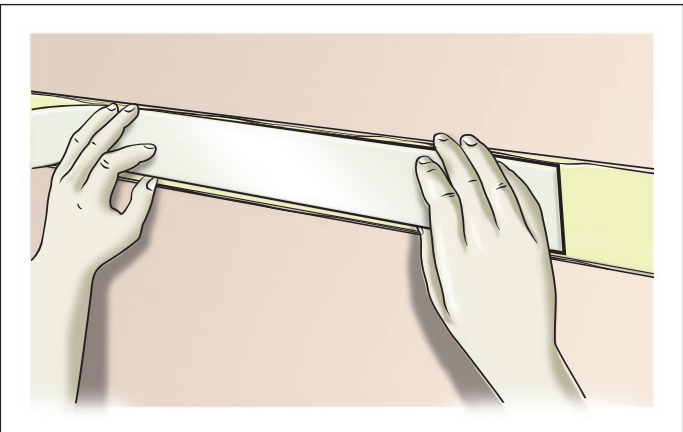
Step 2 – First coat

Apply James Hardie™ Base Coat to fill the recess with a 150mm broadknife.



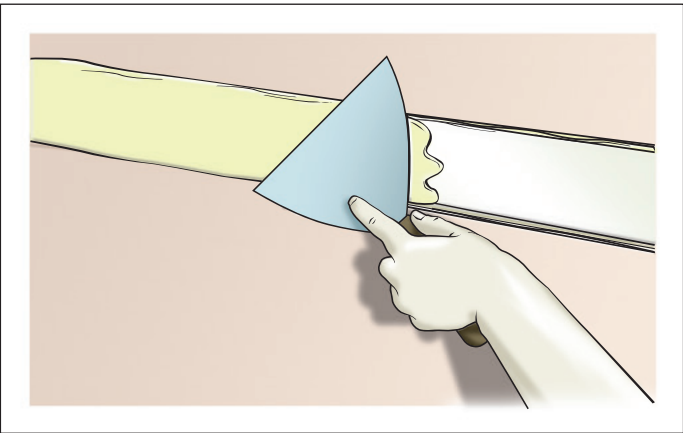
Step 3 – Embed tape

Firmly embed the perforated paper tape centrally into the joint using a 150mm broadknife. Ensure that there are no voids under the tape and remove excess compound.



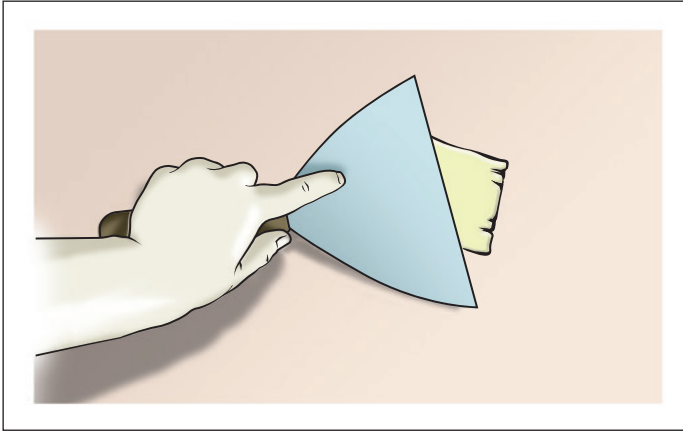
Step 4 – Thin layer

Immediately cover tape with a thin layer of James Hardie™ Base Coat applied with a 150mm broadknife.



Step 5 – Fastener heads

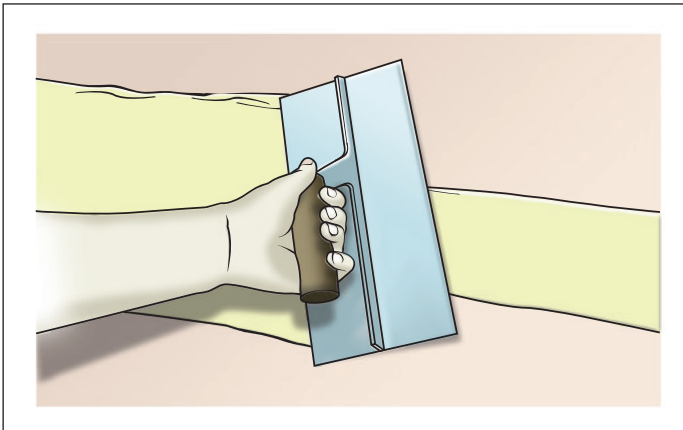
Cover all fastener heads with James Hardie™ Base Coat. Allow to dry before applying a second coat.



NOTE: Steps 6-9 are not required for tiled walls.

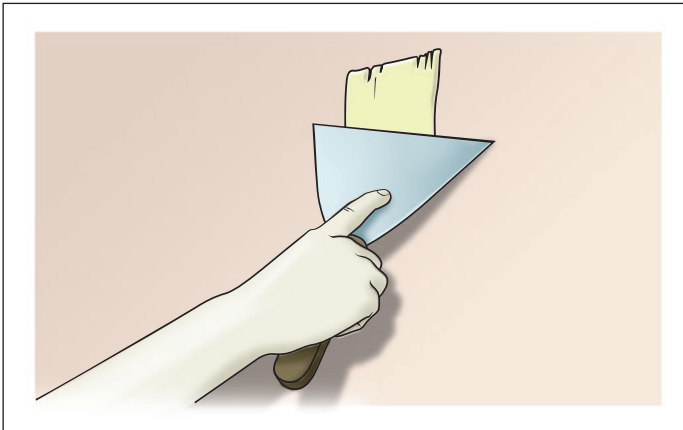
Step 6 – Second coat

When the base coat is fully dry, use a 200mm wide second coat trowel to apply the James Hardie™ Base Coat. Apply this coat approximately 180mm wide, laid down over the recess and feather the edges.



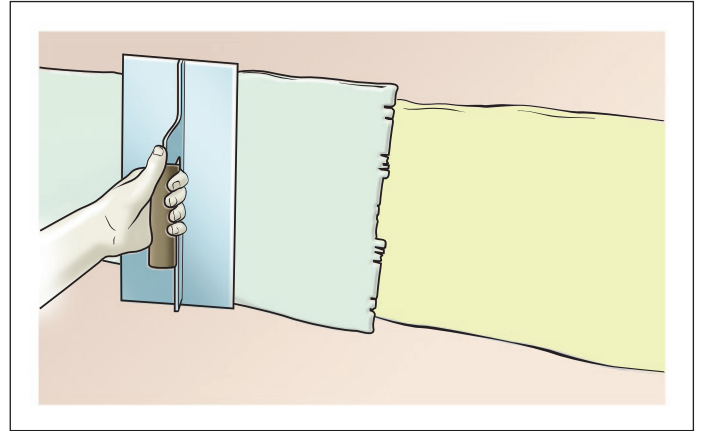
Step 7 – Fastener heads

Ensure the base coat is fully dry. Apply a second coat over fastener heads using the James Hardie™ Base Coat, overlapping the first by a minimum of 25mm. Allow to dry before applying finishing coat.



Step 8 - Finishing coat

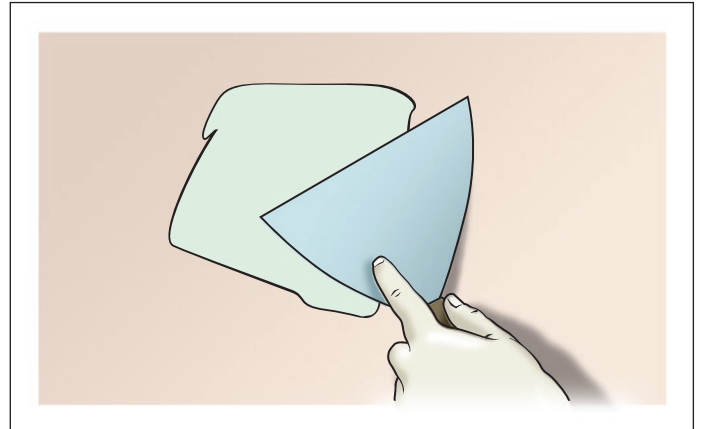
Ensure the second coat is fully dry. Using a finishing trowel, apply a coat James Hardie™ Top Coat 280mm wide centrally over the joint and feather out the edges. Allow to dry fully before sanding.



Step 9 – Fastener heads

Ensure the second coat is fully dry.

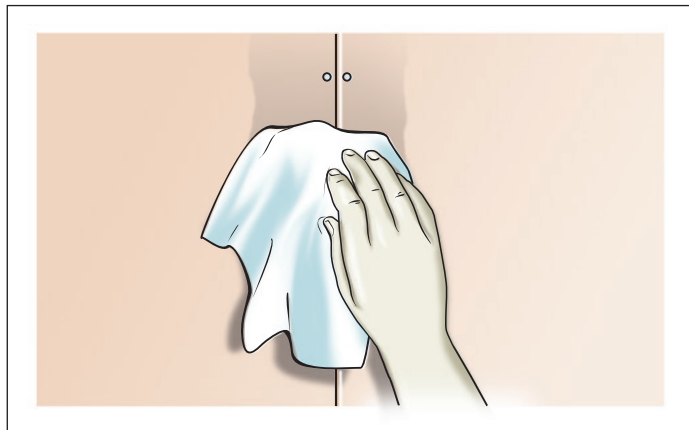
Apply a finishing coat of James Hardie™ Top Coat over fastener heads, feathering out the edges. Allow to fully dry before sanding.



BUTT JOINTS

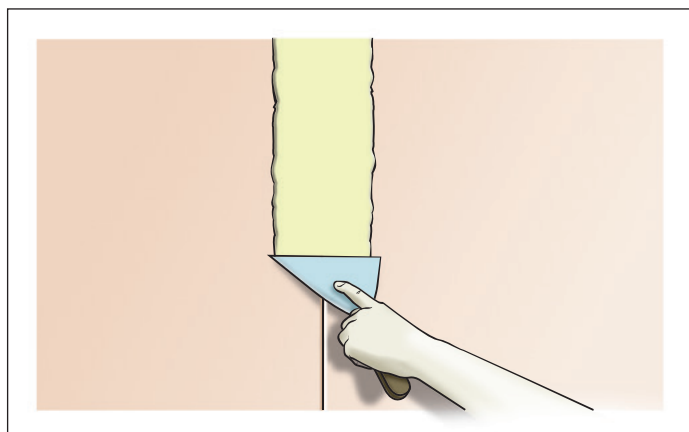
Step 1 - Preparation

When jointing unrecessed sheet joint, ensure that sheet edges are clean and free of dust and contaminants. If working conditions are hot and dry, dampen the area around the joint prior to working.



Step 2 – First Coat

Apply James Hardie™ Base Coat centrally over butt joint to 200mm wide with a 150mm broadknife.



Step 3 – Embed tape

Firmly embed the perforated paper tape centrally using a 150mm broadknife. Ensure that there are no voids under the tape and remove excess compound.



Step 4 – Thin layer (untiled walls only)

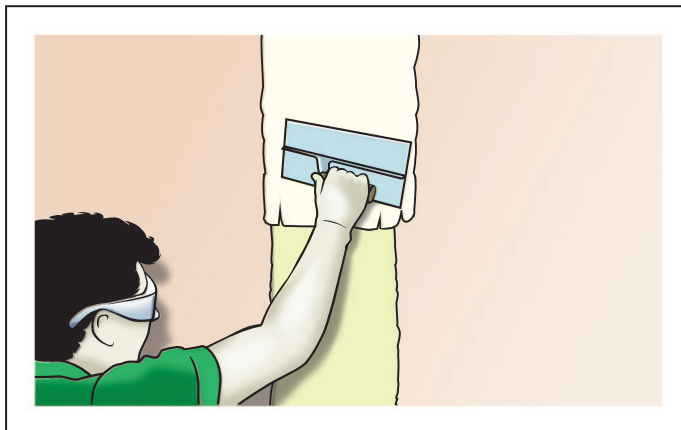
Immediately cover tape with a thin layer of James Hardie Base Coat applied with a 150mm broadknife.



NOTE: Steps 5 and 6 are not required for tiled walls.

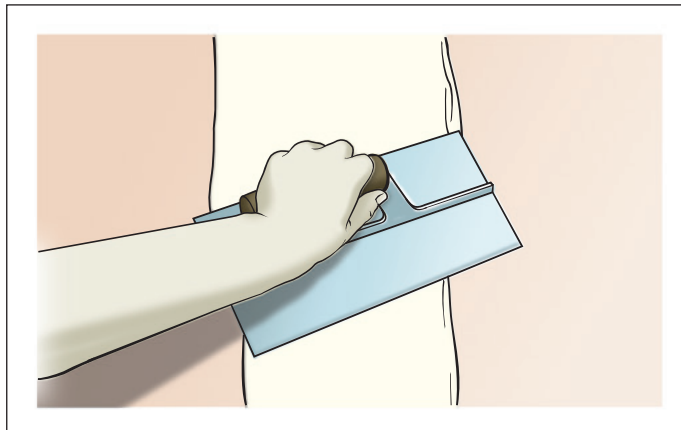
Step 5 – Second Coat

When the first coat is fully dry, use a 200mm wide second coat trowel to apply the James Hardie™ Top Coat compound. Apply this coat approximately 300mm wide.



Step 6 - Finishing Coat

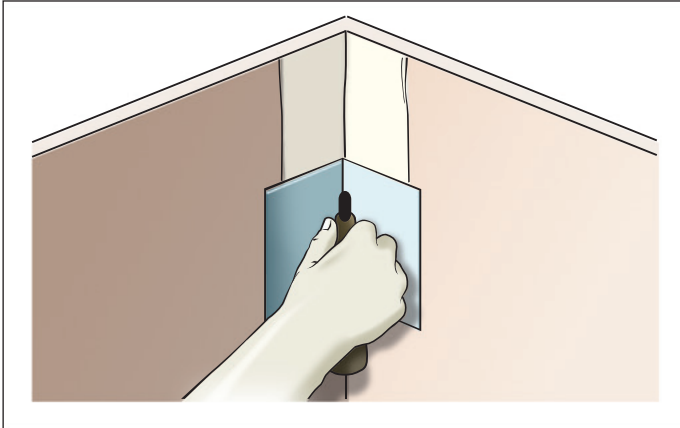
Ensure the second coat is fully dry. Using a finishing trowel, apply a coat of James Hardie™ Top Coat 500mm wide centrally over the joint and feather out the edges. Allow to fully dry before sanding.



INTERNAL CORNERS

Setting of internal corners are required for untiled applications only as follows:

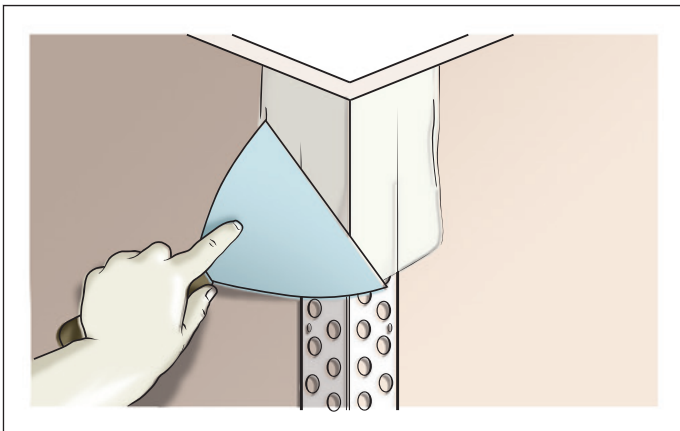
- Apply bedding compound to both sides of the corner using a 70mm broadknife.
- Fold paper tape to form an angle and embed into the corner using a 100mm corner tool and cover with a skim coat.
- Allow tape coat to dry, then apply a thin finishing coat by laying additional compound over the angle and smoothing with the corner tool.
- Allow to fully dry before sanding.



EXTERNAL CORNERS

Setting of external corners is required for untiled applications only as follows:

- Fit a perforated corner angle over the external corner angle and ensure straightness before fixing with fibre cement nails at 300mm centres.
- Apply Lanko 124 or Davco Ultraprime to the PVC angle to ensure strong adhesion of James Hardie base coat to PVC.
- Apply bedding compound to both sides of the corner angle to a width of 150mm using a broadknife. Allow to dry before applying a second coat.
- Using a straight trowel, build up the edges to 250mm from the corner. Allow to dry.
- When dry, use the straight trowel to apply a thin finishing coat, 300mm wide, to both sides of the corner angle, feathering out the edges.
- Allow to fully dry before sanding.



CONTROL JOINTS

Control joints are required in long runs of Villaboard™ lining walls or ceilings in both directions. These joints are designed to take up the structural movement between the sheets and the building frame. They may also be required in ceilings where they change direction or continue into passage ways. Control joints should also be provided at frame junctions/joints such as wall intersections.

See Table 7 for maximum control joint spacings and Figure 15 for a typical detail.

CEILING DIRECTLY UNDER A ROOF/CEILING/DECK

NOTE: Where Villaboard™ linings are installed to ceilings directly under roof spaces less than 600mm, the control joints must be reduced. In these cases, Versilux™ lining is recommended. If Villaboard™ lining is used, control joints must be reduced to 6.0m for insulated ceilings and 3.6m for uninsulated ceilings in both directions.

TABLE 7 MAXIMUM SPACING FOR CONTROL JOINTS (m)

	STEEL FRAMING		TIMBER FRAMING
	0.55 – 0.75mm BMT	Greater than 0.8 – 1.6mm BMT	
*General	9.0	6.0	7.2
Tiled walls	4.8		4.2

* Refer to note above Table 7 on fixing Villaboard™ lining to ceilings directly under a roof/ceiling/deck application.

Horizontal control joints in walls are required at 3.6 maximum centres. When sheeting vertically a horizontal control joint is required at the sheet end when using sheets shorter than 3.6m in length.

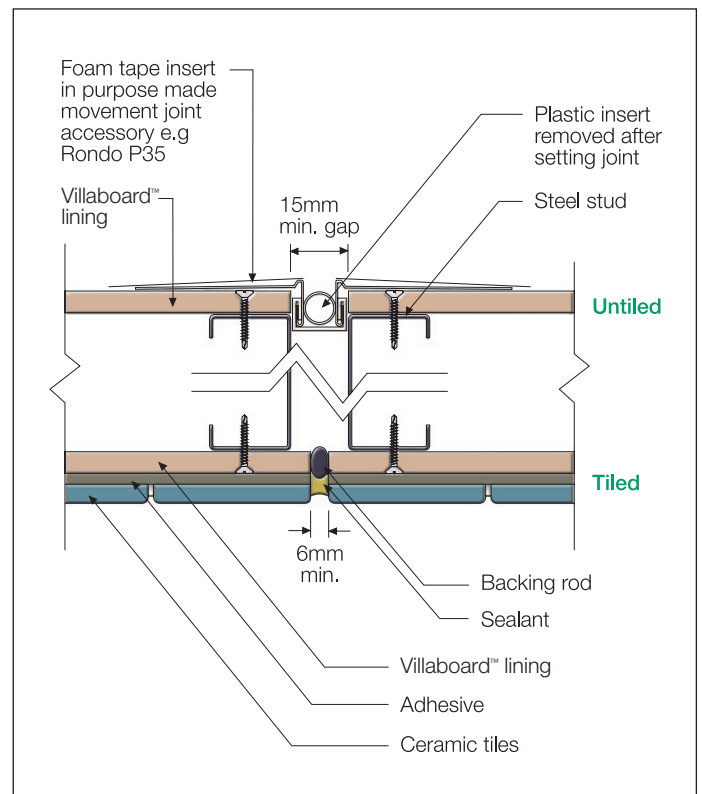


FIGURE 15 CONTROL JOINT

7 FINISHES AND MAINTENANCE

GENERAL

Villaboard™ lining is finished with either paint or tiles as required. The application and maintenance of these finishes must be in accordance with the manufacturer's specifications.

NOTES

1. For wet areas, the waterproofing requirements of all relevant codes, standards and regulations must be met. For more information on wet area construction refer to the James Hardie Wet Area Construction Design Manual.
2. Refer to the manufacturers' specifications on application, compatibility and suitability of waterproofing membranes.

GLANCING LIGHT

In some instances, due to glancing light, set joints may be noticeable in Villaboard™ lining walls, especially where paint finishes have a high gloss level. Work closely with your builder or designer to minimise this.

Artificial lighting needs to be considered in relation to walls and ceilings (e.g. down-lights in ceilings above set joints in walls). Ceilings and wall joints should run in the direction of the light source (at right angles to windows).

Where glancing light is an issue its effect can be lessened by:

- The use of curtains or blinds.
- Artificial light shading devices.
- The use of light coloured, matt finish paints.

LEVEL OF FINISHES

Different levels of finishes are typically specified for different applications. Higher levels of finishes are used to address the glancing light issues with painted Villaboard™ lining referred to above. A description of the various levels of finishes and the jointing/coating requirements can be found in Table 8.

TABLE 8 LEVELS OF FINISHES			
LEVEL OF FINISHES	DEFINITION*	TYPICAL JOINTING/SETTING	FINISH
0	This level of finish may be useful in temporary construction.	No stopping, taping, finishing or accessories are required. The work is confined to gluing or screwing/nailing sheets in place.	For use in areas where finishing and stopping is not considered necessary.
1	For use in plenum areas above ceilings, in areas where the work would generally be concealed, or in building service corridors and other areas not normally open to public view.	Joints and corner joints will be set with James Hardie™ Base Coat bedding compound reinforced with perforated paper tape.	Surface free from excess jointing compound. Tool marks and ridges are generally acceptable.
2	For use in warehouse, storage or other areas where surface appearance is not of primary concern.	Joints and corner joints will be set with James Hardie™ Base Coat bedding compound reinforced with perforated paper tape and James Hardie™ Top Coat topping compounds.	Minor tool marks and ridges are generally acceptable.
3	For use in areas which are to receive heavy or medium texture (spray or hand applied) finishes or where heavy wall coverings paper are to be applied as the final decoration. This level of finish is not generally suitable where smooth painted surfaces or light to medium wall coverings are specified.	Joints and corner joints will be set with James Hardie™ Base Coat bedding compound reinforced with perforated paper tape and James Haride™ Top Coat topping compounds.	This level of finish must be sufficiently smooth to accept vinyl, tiles, or textured coatings without blemishes.
4	This is generally the accepted level of finish for domestic construction. It is used where light textures or wall coverings and smooth textured finishes and satin/flat/low sheen paints are illuminated by non-critical lighting.	Refer to flush jointing recommendations on page 11.	For use when light-texture coatings or wallpaper or other lightweight wall coverings are to be applied. For painted finished in non-critical lighting areas flat and low-sheen textured paints are to be applied. Gloss and semi-gloss paints are not generally suitable over this level of finish as any minor blemish will show under critical light. The weight, texture and sheen level or wall coverings applied over this level of finish must be carefully evaluated. Joints and fasteners must be adequately concealed if the wall covering material is light weight, contains limited pattern, has a gloss finish, or any combination of these features is present. Unbacked vinyl wall coverings are not suitable over this level of finish.
5	This level of finish is for use where gloss or semi-gloss paints are specified or where critical lighting conditions occur on satin, flat or low sheen paints.	Typically all joints and corner joints will have tape embedded in James Hardie™ Base Coat bedding compound applied over all joints, angles, fastener heads and accessories. A thin skim coat of finishing compound must be applied to the entire surface to be plastered. The surface must be finished smooth and free of tool marks and ridges and special care must be taken with the application of the finishing compound to achieve a smooth, true surface suitable for these critical finishes.	This level of finish is for use where gloss, semi-gloss, low-sheen or non-textured paints are specified or where critical lighting conditions occur.

*Reference: AS/NZS 2589.1:1997 'Gypsum lining in residential and light commercial construction - Application and finishing. Part 1: Gypsum plasterboard'

8 PRODUCT INFORMATION

PAINT FINISHES

Prior to application of paint finishes, remove any residual sanding dust and ensure the surface is suitable for paint application.

Apply a minimum two coats of a quality interior paint. Gloss paints are not recommended. Always follow the paint manufacturer's recommendations for paint suitability, mixing and application.

NOTE

Use of a 'sealer coat' or 'preparation undercoat' is recommended.

CEILING CORNICES

A conventional set plaster cornice may be used with Villaboard™ lining, provided the Villaboard™ lining is wetted with a sponge prior to adhesive fixing of cornices.

Plaster cornice is to be attached to the ceiling only, using cornice setting compound.

TILED FINISHES

The thicknesses of tiles used over Villaboard™ lining are restricted based on stud centres and the thickness of the sheet, see Table 9.

James Hardie only recommends the use of flexible tile adhesive for tile application. Refer to adhesive manufacturer for suitability and application information.

NOTES

1. Do not tile ceilings.
2. Do not tile to walls over 3m in height.

TABLE 9

MAXIMUM TILE THICKNESS		
VILLABOARD™ THICKNESS (mm)	MAXIMUM TILE THICKNESS (mm)	
	600mm Stud Cts	450mm Stud Cts
6	9	13
9	13	18
12	18*	>25*

*Support angles are recommended.

The suitability and positioning of support angles is to be determined by a structural engineer. Support angles need to be fixed into the supporting frame and the overall wall mass and stability needs to be considered.

MAINTENANCE

James Hardie recommends that the cleaning and maintenance of all finishes be undertaken regularly as per the recommendations of the manufacturer. Joints must also be maintained and be free of dirt and grime.

GENERAL

The basic composition of James Hardie™ building products is Portland cement, ground sand, cellulose fibre, water and proprietary additives.

James Hardie™ building products are manufactured AS/NZS 2908.2 'Cellulose-Cement Products-Flat Sheet'. These are also compliant with equivalent standard ISO 8336 'Fibre-cement flat sheets - Product specification and test methods'. For product classification refer to the relevant Physical Properties Data Sheet.

PRODUCT MASS

Based on equilibrium moisture content the approximate mass of Villaboard™ lining is:

- 6mm thick - 8.3kg/m²
- 9mm thick - 12.4kg/m²
- 12mm thick - 16.6kg/m²

DURABILITY

Resistance to moisture/rotting

Villaboard™ lining has demonstrated resistance to permanent moisture induced deterioration (rotting) by passing the following tests in accordance with AS/NZS 2908.2

- Water permeability (Clause 8.2.2)
- Warm water (Clause 8.2.4)
- Heat rain (Clause 6.5)
- Soak dry (Clause 8.2.5)

Resistance to Fire

Villaboard™ lining is suitable where non-combustible materials are required in accordance with C1.9 of the National Construction Code (NCC).

James Hardie building products have been tested by CSIRO in accordance with AS/NZS 3837 and are classified as conforming to Group 1 material (highest and best result possible), with an average specific extinction area far lower than the permissible 250m²/kg, as referenced in Specification C1.10a of the National Construction Code (NCC).

Resistance to termite attack

Based on testing completed by CSIRO Division of Forest Products Report Numbers FP349 and FP274, James Hardie™ fibre cement has demonstrated resistance to termite attack.

WARRANTY

For Warranty information visit www.jameshardie.com.au or call James Hardie on 13 11 03.

NOTES

NOTES



**For information and advice
call 13 11 03 | jameshardie.com.au**

Australia May 2019