

G.J. Gardner.

HOMES

Specification of work and materials for the erection and completion of the new dwelling

For the owner G.J. Gardner Homes

Lot- 5

Street address- ~~Bolton Pl.~~ *Anglic Place*

DP- to be advised

Prepared for the- Tasman District Council

Floor area- 198.6 sqM

Owners address- 199 Queen St, Richmond

Telephone- 544 4520

Fax- 544 4509

TASMAN DISTRICT COUNCIL
APPROVED CONSENT DOCUMENT
THIS DOCUMENT MUST REMAIN ON THE JOB UNTIL COMPLETION
GIVE 24 HOURS NOTICE BEFORE any work is covered up:

- Inspection is required **BEFORE** any:
 - Concrete, masonry, in-fill grouting, placement, lining stopping, cladding, roof fixing, structural framing enclosure, lining stopping, covering up of plumbing and drainlaying.
- **PLUMBERS GASFITTERS & DRAINLAYERS ACT 1976** permits only Craftsman Plumbers and Registered Drainlayers and Gasfitters to carry out those trades.
- The Consent holder is responsible and liable for any damage as a result of this work being carried out.

BUILDING CONSENT NO: *055383* **APPROVED DATE:** *8/8/05*

SIGNED: *sm*

DEVIATIONS FROM THIS DOCUMENT REQUIRE FURTHER APPROVAL

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1:PRELIMINARIES AND GENERAL

SCOPE:

This specification with the conditions of contract describes the work to be done and the materials to be used in the construction of the house shown in the attached drawings. The contractor is expected to be familiar with the site and the local building bylaws, especially where relevant clauses of NZS 3604:1999 Timber framed Buildings applies. There is a copy in the Richmond area office that is available at all times, a copy should be kept on site at all times where possible. All trades and sub-trades to read 'preliminaries and general'.

WORKMANSHIP AND CONSTRUCTION:

Workmanship and construction shall be of the best trade practice and shall comply with the relevant provisions of the Standards. Defective or damaged work should be removed and made good.

SITE:

A visit to the site as to be fully acquainted with the facilities or difficulties of the access etc. is suggested. The Contractor is to protect adjoining properties wherever possible and shall make good any damage directly attributable to the Contractor. Including footpaths, kerbs, drainage etc reinstated to its original or acceptable condition.

CONSENTS AND FEES:

Unless otherwise noted G.J. Gardner Homes is responsible for the building consent fees and application of the building consent. Where inspections are required on site, the tradesperson involved is to give 24 hours notice to the building inspector where possible. The designer is to be made aware of any changes required by the Local Authority to the working documents.

VARIATIONS:

No variation of any kind shall be made to the contract without direct written instruction from the employer or in some cases from the client providing it is accompanied by a signature. The price of the variation must be agreed upon in writing before work commences.

SAFETY PRECAUTIONS:

Allow to comply with all requirements of the New Zealand Building Code.

ATTENDANCE OF TRADES:

Make good after all trades. The contractor is to leave all necessary holes, chases, sleeves, ducts, blocking as required by subsequent trades where practical. Trades to inform contractor of requirements.

2:PRELIMINARIES AND GENERAL

SETTING OUT:

Any discrepancy between work as set out and the drawings must be reported to the designer before construction begins. The contractor is responsible for the accuracy of the setting out. The levels shown on the drawings are to be assumed accurate, however the contractor is to verify these on site.

STABILITY:

The Contractor shall carefully brace and support all parts of work against damage by wind, subsidence, surface water, etc and also protect the same from damage by exposure to the elements

INTERPRETATION:

Work or materials shown on the drawings or specified and not shown must be supplied as though both shown or specified. Any materials that have been specified and are not procurable within an acceptable time frame (to the contractor) can be substituted providing they are in compliance with the NZBC and are similar to the original product in its service and intention. Any price increase between products will be made as a variation. All figured dimensions should be taken in preference to scale. The Contractor shall be held responsible for the setting out of work and shall make good at own expense where they have caused an error.

SCAFFOLDING:

External and internal scaffolding to be erected where found to be necessary by the site supervisor. Erect to the satisfaction of authorities and remove after completion.

FINISHED WORK:

A good standard of workmanship and finish is required throughout the building contract. If any trade considers that any surface finish or fitting is in a satisfactory condition to ensure a proper fitting for their own it is imperative to contact the site supervisor before work commences. Work is only to proceed at such a time that the necessary improvements have been made. The methods of construction and the type, quality and sizes of material used to complete the work shall not be less than that required by NZBC approved documents and means of compliance including NZS3604:1999 and that required by the appropriate Territorial Authority.

KEEPING CLEAN AND CLEARING OF SITE:

All trades will be responsible to remove their rubbish at the completion of their works into the rubbish skip as provided. Before handover the house is to be professionally cleaned to the highest (as practical) level and all trade debris removed from site.

3:EXCAVATOR

CLEARING OF BUILDING AREA:

Clean off all vegetation and sub-soil over building area. Leave existing trees where possible unless marked on the plan as being for removal.

SETTING OUT:

Excavate all foundations to a minimum depth as shown or required by NZBC and approved documents. Set out all work shown or implied by drawings. Check accuracy in terms of position levels and square. Take out trenches straight, level and to proper width, keep free of water and loose material.

DOUBTFUL BEARING:

Where doubtful bearing is encountered or where required by consent notice or drawings a structural engineer shall be employed to design the foundation. The contractor is to liaise with the engineer in regard to all site works and all work must be carried out under the engineers supervision. Engineers documents take precedence over any reference on plans or specifications for the building. Where required any extra inspections to be called for by contractor and checks made to ensure inspections have been carried out. The engineer will be required to provide a producer statement and copies of calculations to Territorial Authority. Where good bearing is encountered foundations shall be a min. of 300mm into solid bearing- or deeper where required by NZS3604:1999.

HARD FILLING:

Under all concrete floors provide well-compacted hard fill to a minimum loose thickness of 150mm. Remove all topsoil under concrete floor (and foundations) and compact hardfill in layers of up to 150mm without disturbing foundation walls. Hardfilling over 600mm deep should be inspected by a registered engineer and carried out to their satisfaction. Hardfill to consist of well-consolidated 40mm rounds free of excess silts, clays or organic material and able to be compacted to a dense layer. Compact to NZS4402:1986

EXCAVATED MATERIAL:

All excavated material shall be stockpiled on site to be removed or utilised by owner unless otherwise stated in the working documents. Backfilling of area around house site by owner.

4:CONCRETOR

MATERIALS AND WORKMANSHIP:

The whole of the concrete work to comply with NZBC and all appropriate standards. All concrete to be of a strength 17.5 MPa after 28 days unless advised by an engineer on a per job basis.

REINFORCING:

Reinforcing steel to comply with the following:

- Mild steel reinforcing (plain) to be grade 300E
- Mild steel reinforcing (deformed) to grade 300E

For bars up to 20mm dia. typical maximum bend radius as follows:

- plain round bars used for stirrups or ties- 2 times bar diameter
- deformed bars- 5 times the bar diameter

Welding of reinforcing is not permitted. Any laps in footing or foundation wall to be 40 times the bar diameter. All hooks and bends to comply with NZS3109. Ensure at time of concreting reinforcement shall be free of loose flaky rust, mud and other coatings which adversely affect bonding capacity. Tie all reinforcing to ensure no displacement occurs during pouring. All reinforcing to comply with NZS 3402.

FLOOR SLAB:

Damp proofing- 250 micron polythene or equivalent damp proof course on a 20-25mm sand or pea-metal blinding over hardfill. Lay DPC to form as few joints as possible. Lap joints 150mm and seal with 50mm wide pressure sensitive tape to achieve a continuous membrane. Protect from damage in all instances and adequately seal around all protrusions and service pipes. Keep short of vertical reinforcing from foundation wall.

Floor slab- 100mm thick 17.5 MPa concrete slab (thickened where drawings require) over HRC 665 reinforcing mesh (NZS 3422) with 30mm cover supported on purpose made chairs. Lap mesh 200mm. A vibrator to be used to provide adequate compaction-finishing and tolerances to NZ3114. Floor to be laid with a straight surface, screeded and finished to a fine surface while still green with an overall tolerance of 5mm over 3m. Limit evaporative drying of slabs where practical for 7 days.

Shrinkage control joints-

Saw cuts to be made at 4m to 5m crs in both directions. Incorporate the isolation of tiled areas into saw cuts. Saw cuts not to compromise reinforcing bars, cut 25mm deep by 6mm wide, clean out cuts and cut no more than 2 days after slab pour where possible.

EMBEDDED ITEMS:

All bolts to comply with AS/NZS1252 and for hold down bolts to NZS3604 and to be drilled or punched. M12 bolts at 1400mm crs max and 300mm from corners or M12 Truebolts at 900mm crs max. Where necessary cast in Lumberlok 'Header Block Anchors' at 900mm max crs as per manufacturers instruction.

5:CONCRETOR

CHASES ETC:

Provide in concrete for openings from vents, wastes, pipes etc or as required by other trades. Form all chases, pockets, flashing grooves etc where necessary. Inform Heat Pump installer before pour for placement of conduits etc. and Plumber and Electrician for any in slab connections.

FORMWORK:

Where formwork is to be used ensure it is well braced, clean and kept wet before and after concrete is placed.

5:BLOCKLAYER

BLOCKWORK WALLS:

Supply and fix reinforcement as detailed in working documents. In general vertical reinforcement shall be placed in advance of the blocks and horizontal shall be fixed as laying proceeds.

MATERIALS:

Masonry construction to be carried out by a competent experienced tradesperson conversant with the requirements of NZS4210:2001. Concrete blocks to AS/NZS4455, mortar and all other materials to their relevant standard.

BOND:

Blocks shall be laid in stretcher bond (or stack bond where specified in drawings). Blocks to be laid evenly spaced, faces true and vertical. Blocks should be free from defects that prevent a good finish. Clean out mud, dirt and debris to provide a clean concrete surface prior to infilling.

ENGINEERS DRAWINGS:

Where engineers drawings are provided they shall be read in conjunction with the working drawings and if necessary override. Notify Engineer at all times for inspection. Where drawings and specification don't cover Engineered work, engineer to provide own specification.

EMBEDDED ITEMS:

Build in all bolts, fixings, pipes etc. where shown on plans.

6:EXTERNAL WINDOW AND DOOR JOINERY

GENERAL:

All workmanship and materials to comply with NZBC and relevant standards. Windows to comply with the strength, deflection and water leakage requirements of sections 10 and 12 of NZS4211

MATERIALS:

All windows and doors shall be aluminium with epoxy powder coat finish, colour as requested by owner.

Pre primed 18mm timber jamb liners are used throughout. Wall linings to butt up to liner and finished with MUF p.f. architraves, unless otherwise noted.

All sill sections to have condensation channels.

All windows and doors to be supplied factory glazed.

GLAZING:

All windows and doors to be single glazed unless otherwise noted

Glass to be specified and fitted as according to NZS4223:1999 and AS/NZS4666

Obscure glass to be clear stipolite to all bathroom and ensuite windows unless otherwise noted. Grade A safety glass to all bathrooms and ensuites etc.

ENTRY DOOR:

1/ 1980 x 860 Timber door unless otherwise noted.

FLASHINGS:

Flashings to be purpose made for each particular cladding to satisfy all requirements of relevant standards including NZBC E2. Materials to comply with durability requirements of Section 4 of NZS3604:1999. Flashings to be compatible with all materials.

7:CARPENTRY

GENERAL:

Workmanship and materials shall comply with all facets of NZBC and NZS3604:1999 Timbered Framed Buildings. All finished work to be protected from discolouration and physical damage where possible. The whole of the carpenters and joiners work must be framed, trussed, braced and assembled in a workman-like manner and in accordance with good trade practice.

MATERIALS:

All timber must be well seasoned, free from large loose or dead knots and waney edges and in all circumstances be suitable for its specific purpose. All timber to be in compliance with NZS3631

Nails, screws and other fastenings shall be the best of their kind, stainless steel (where in accordance with galvanic table) for exposed situations

PRESERVATIVE TREATMENT:

Minimum treatments to NZS 3602:2003 and NZS 3604:1999

Wall framing	H1.2 with H3.1 treated bottom plate
Roof + ceiling framing	H1.1 or untreated
Intermediate flooring	H1.1
At risk Wet areas	H3.1
Cavity battens	H3.1

MOISTURE CONTENT:

Timber shall be seasoned to the following moisture content:

Framing Timbers; Kiln-Dried, Exterior finishing; 14-18%, Interior finishing; 10-14%

Once building closed in ventilate during the day and at night where possible. Keep all materials as dry as possible and ensure materials that are adversely affected by moisture are not installed until building is weathertight.

DAMP PROOFING:

Protect timber from concrete with 3 ply bituminous felt. DPC between pile and bearer where shown on drawings.

8:CARPENTRY

WALL FRAMING:

Plates to be in long lengths with nail plates at all connection points. Frame up walls with gauged 90 x 45 timber with studs at 600mm max crs and dwangs at 800mm crs to suit linings (framing to overheight areas as specified by NZS3604:1999). Brace walls where shown using galvanised strap bracing. All bracing to NZS3604:1999 and Gib Bracing Systems product guide.

ROOF FRAMING:

Pitched roofs shall be framed in Gang-Nail type trusses at 900mm max crs. Approved Fabricator to design and construct trusses and to supply producer statement and truss layout plan to builder. Fabricator must also produce roof truss design statement prior to building consent according to T/A's instruction.

Fix trusses to top plate using a pair of galvanised Z nails. 75 x 50 r/s purlins at 900mm max crs or 50 x 40 battens for tile roof. Extra fixing requirements to be provided where deemed necessary due to wind zone by NZS3604:1999. Galvanised strap bracing where shown on plans, if not shown to NZS3604:1999.

CEILING:

10mm standard Gib plasterboard on Gib Rondo steel battens at 450mm max crs packed to provide a true and level surface to a good quality finish. Perimeter batten as necessary.

EXTERNAL:

1. Building wrap- Gib Frameguard
- 2a. 70 series brick veneer with 50mm cavity- from builders selection
- 2b.
3. Soffit- 4.5mm Hardisoffit fibre cement lining- paint finish

INSULATION:

Exterior walls to be insulated with R2.2 fibreglass batts, fit batts at Garage/House internal wall. R2.6 batts to ceiling (except garage). Ensure no gaps around edges, the minimum thickness of the insulation is maintained and the batts are crushed or forced into gaps. Polystyrene boards may be used in slab, check plan. Install after laying the damp proof membrane and before placing the slab.

9: CARPENTRY

INTERNAL LININGS:

10mm standard Gib plasterboard to all internal areas unless otherwise specified on the plan. Generally lay sheets horizontally and loosely butt sheets. Tape all joints and plaster to a smooth finish, sand back to a to achieve a suitable finish for paint. Use suitable bedding and finishing compound to achieve F4 finish.

10mm Gib Braceline sheets to be used where shown on plan. 10mm Gib Aqualine to wet areas or 10mm standard Gib plasterboard with appropriate paint system (1 coat pigmented sealer as moisture barrier and 2 coats of waterbourne acrylic enamel).

Wall linings not to be fixed until moisture content of studs at appropriate level (12-16% for Gib plasterboard). Minimise joints wherever possible.

Check framing is straight and true before lining. Ensure all holding down bolts have washers and nuts and are tightened down. Holding down straps or Z-nails to prevent uplift are fitted. Lintels are tied down as required. All dwangs as supports to power outlet boxes, downpipes etc. are installed. All wiring and plumbing complete and tested.

INTERNAL FINISHINGS:

Generally architraves to be used unless specified on plan or order. Fix all scotia, skirtings, architraves and mouldings as necessary. Door stops, toilet roll holders, door furniture and hardware as standard unless otherwise specified, to be fixed by builder.

HOT WATER CYLINDER:

Build stand for Hot water Cylinder and Cold water Header tank as per NZBC with earthquake restraints.

MANHOLE:

Provide 600mm x 600mm Gib plasterboard ceiling access panel where shown on plan or in garage. Also provide external hatch as sub-floor access where appropriate.

STAIRS:

Builder to install staircase made by specialist sub contractor as per instructions. Install treads perfectly level and secure in place (preferably with screws). Fit handrails as per NZBC- keep 900mm to 1m off noseline of stairs, continue rail 300mm past end of step.

10:DRAINAGE

MATERIALS:

All work shall comply with the drainage and plumbing regulations of the NZBC clause G13.

Stormwater and sewer pipe shall be 100mm uPVC complying with NZS7649, 7602, 7641 and 7642.

Where stormwater and sewer pipes are less than 500mm below ground they are to be covered in concrete by owner. Concrete min. 17.5Mpa to NZS3109.

TRENCHES:

Excavate for all drains as required in positions shown on drawings, keeping trenches free of water at all times. Trenches shall be true to line, of even gradient and of sufficient depth. Trenches to be of sufficient width to allow for adequate working space for proper jointing and inspection of pipes. Service trenches to be cut along shortest practical route.

DRAINS:

Lay drains on 100mm of crushed metal to adequately support pipe along length and haunch to centreline. After testing and T/A inspection cover pipes to 100mm from top of pipe with crushed metal. Provide all necessary bends, inspection eyes, junctions and connect. All drains to run min. 1:100 fall where appropriate.

SUMPS:

Supply sumps where shown on plan and by builder. Set height to ensure adequate fall to finished surface.

11:ELECTRICIAN

GENERAL:

The complete installation and its execution shall comply totally with the NZ Electrical Safety Regulations 1993, Electrical Codes of Practice, all Electrical Supply Authority regulations and other regulations governing the work involved. Conceal all wiring in framing. The registered electrician shall be a certified person with a current practising certificate.

MAINS:

Make all necessary applications and to local supply authority. Connect to main, ensure all wiring is underground within the site boundary. With temporary power to site for construction. All cables to be of the appropriate size take required loads and to comply with Electrical Wiring Regulations and Local Supply Authority requirements. Cables and mains underground to NZS6401.

SMOKE ALARMS:

Smoke Alarms to be installed by specialise sub-trade to Sect 3 F7 of the NZBC. All smoke alarms to have 'hush' button and comply with either of the following: UL217, CAN/ULC S531, AS3786, BS5446:Pt 1.

METER BOX:

Provide and install galvanised 600x400mm meter box as where sited on the plan. Distribution board to be sited in house and fitted with all necessary fuses and switches, all properly labeled and sized to suit. The breakdown and design layout of the board is the responsibility of the Electrician.

TELEPHONE:

Wire for or supply the necessary drawer wires or arrange for Telecom to pre-wire for telephone outlets shown on plan.

ELECTRICAL FITTINGS:

Electrician to ensure all fittings are positioned as shown on plans to heights shown. All cables to be concealed within wall cavity.

12: PAINTER

GENERAL

All work shall be carried out by specialised firm of tradesman painters in accordance with AS/NZS 2311 2000 Guide to painting Buildings. Refer to colour selection. Paint all interior and exterior of house in Resene paints.

Paint all tops and bottoms of doors, with attention to wet areas

WORKMANSHIP:

All primers, sealers and undercoats must be those recommended by the manufacturer of the finishing coats. It shall be the responsibility of the painter to ensure that all surfaces are in order to produce a good-class finish. Painter to ensure the proper protection of surfaces that will remain unpainted.

PREPARATION:

All preparation work such as dusting, filling, sanding and sealing is to be carried out. Surfaces shall be clean, dry, smooth and rubbed down before painting and between coats. Clean all adjoining surfaces, glass and fittings of any paint contamination as you go. At finish of job clear marks and spots from painted surface.

MATERIALS:

Internal walls and ceiling to have one coat sealer and two coats acrylic paint to manufacturers instruction. Internal walls and ceilings to wet areas to have one coat pigmented sealer as moisture barrier and two coats of waterbourne acrylic enamel. Pre-primed doors, door jambs, architraves, reveals and skirtings to be painted in one coat enamel.

External fibre cement soffit; two coats acrylic, External metal; one coat primer and one coat enamel, other external surfaces as per manufacturers instruction.

CONDITIONS:

Carry out work within the temperature and humidity ranges as specified by manufacture and with surface to the required moisture level.

13:ROOFING

WORKMANSHIP:

Roof installed (including gutters and flashings) should keep out the rain and wind and channel water as quick as possible to defined discharge points. It should accommodate thermal movement and be secured to resist wind and earthquake forces.

Minimise traffic over roof and walk along lines of support in soft-soled non-slip footwear. Clean the roof of all debris each day and test the roof for leaks, preferably on a windy day.

MATERIALS:

Lay self-supporting building paper having 75mm min. to 150mm recommended laps, laid horizontally and discharge into spouting. Lay bottom sheet first and ensure paper is carried over ridge.

Colorcote metal roofing tile to be installed as per manufacturers instruction with special attention paid to additional fixing requirements where building found to be in high, very-high wind zone. Ensure sheets are checked for defects, damage or wet storage stain. Sheet side laps to face away from prevailing/ strongest wind. Regular checks are to be made to ensure all roofing remains parallel with barge board, project edge of sheet 50mm past back of guttering.

CLEANING:

Brush down roofing with a soft brush to remove any offcuts, filings etc to prevent staining of roof. Also clean out guttering.

FLASHINGS:

All roof flashings, guttering to be fitted to manufacturers instruction. Allow for thermal movement and provide sloped surface to let water drain off. Ensure materials of flashings are compatible with other materials used.

13:GAS SERVICE

STANDARDS:

All gas works to NZBC G10 requirements, manufacturers instruction and all other applicable standards.

MATERIALS AND WORKMANSHIP:

All materials to be the best of their respective kinds. All plant to be the appropriate type to produce the required standard of workmanship and installed by a registered gas fitter and provide a certificate at completion of the job.

14:PLUMBER

GENERAL:

Sanitary plumbing to comply with G12 and G13 of NZBC 1992 and territorial authority requirements. All pipes to be adequately supported through their length to prevent sagging and secured to the structure using purpose made brackets and straps. All pipes to be concealed behind wall linings, unless it is impractical to do so.

MATERIALS:

- Aquatherm Fusiotherm fusiolen PPR-80 (for cold/hot water) to manufacturers instruction
- Wastes, vents and soil pipes shall be rigid PVC to comply with NZS7641 and NZS7642
- Polythene underground supply 25mm

DOWNPIPES:

All downpipes to be 65mm dia. PVC (unpainted) unless otherwise specified. Pre-coated steel fascia-gutter to be fixed by specialist sub-contractor to manufacturers instruction.

COLD WATER SERVICE:

Connect up to new water meter at street and run 25mm supply to house to point shown on plan. Provide two brass external hose taps unless otherwise specified. Any water supply pipe exposed to outside to be protected from freezing.

VENTS, WASTES AND TRAPS:

Vents to be solvent sealed PVC with appropriate cage. Provide suitable skirt flashing at roof penetration. All traps to be screwed polypropylene, wastes solvent welded PVC.

FIXTURES AND FITTINGS:

Bath, kitchen sink, vanities, shower bases and Supertub S3000 (unless otherwise specified) to be connected only by plumber, builder to install.

HOT WATER CYLINDER:

Rheem hot water cylinder (180litre minimum) to be lagged and cased to comply with NZS4602. Installation of heater and associated piping and equipment to comply with NZS4603 or NZS4607 where appropriate. Either installation to comply with NZBC and include all necessary valves, filters, drains and a tempering valve to NZS4617. Set and test HWC temperature to 55C degrees.

Ensure both Hot water Cylinder and Supply tank (where present) are secured against seismic resistance using 25 x 1mm metal strap and turnbuckle to roof or wall framing to NZS3604, NZS4102 and NZBC:G12 AS1.

15:BRICKLAYER

BRICK VENEER

Construct brick veneer as shown on drawings. An air space of at least 40mm shall be maintained between the timber frame and brick veneer. Provide perpend at every third joint along bottom and top rows (and at window sills) for the discharge of water. Care shall be taken to maintain the air space and upstand free of any mortar droppings, protruding pipes, joints, junction boxes, electrical wire etc. Incorporate vermin proofing where necessary. All facing work to be kept clean as the work proceeds. On completion all brickwork to be left in clean state.

20mm is the maximum overhang of brick over foundation without permanent support (eg plaster where suitable).

Use stretcher bond. Set bricks out neatly. Where bricks need to be cut, set out visually pleasing way or in an inconspicuous position. Ensure all bricks are blended to ensure even spread of colour. Check colour and size of bricks before work commences. Bricks to be laid level and plumb. Protect bricks from damage and staining from other trades. Where possible keep bricks dry at all times

CONTROL JOINTS

Concrete bricks to be constructed with control joints as required by NZS4210 and manufacturers requirements.

MATERIALS

Bricks from builders selection, mortar cement as per colour on order, building paper Gib Frameguard, all lintels galvanised mild steel and brick ties to be galvanised ties unless otherwise specified. Mix mortar by volume to ensure even colour throughout job or use Trade Mortar. Tool all mortar joints to achieve smooth sealed joints. Joints to be raked a maximum of 6mm.

BRICK TIES

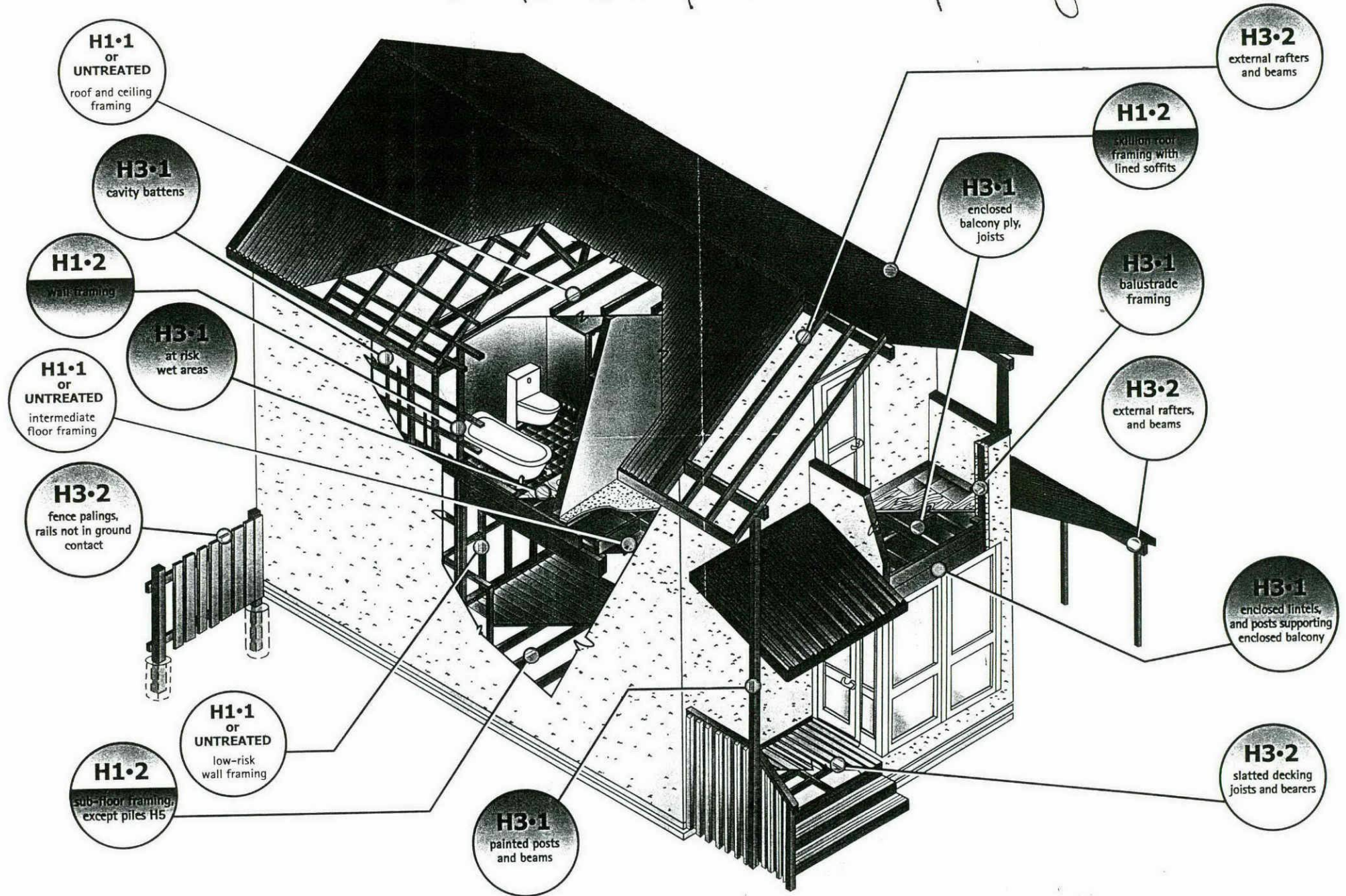
Use 5 screw fixed brick ties per sqm, 600mm horizontally, 350mm vertically or accepted variation. Position in the middle of the mortar course.

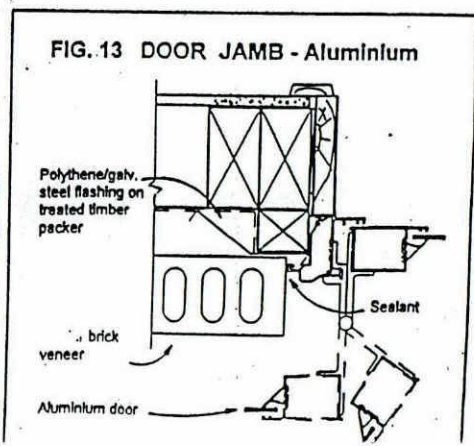
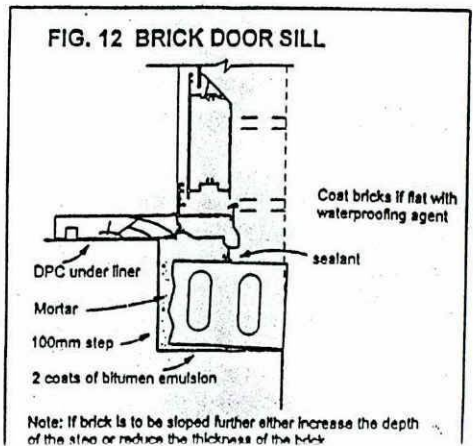
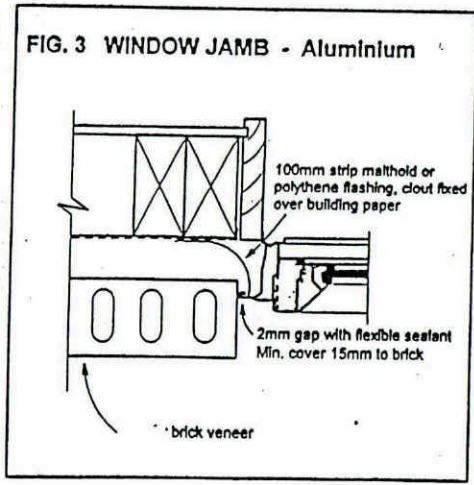
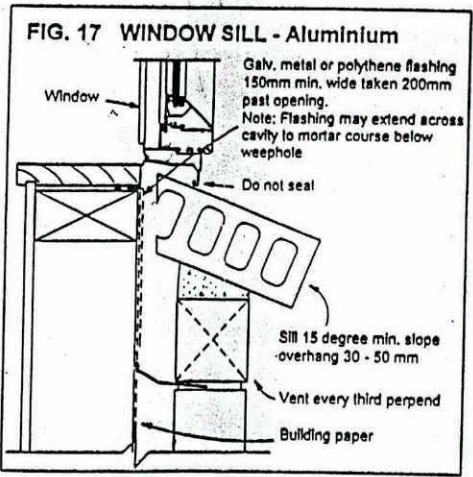
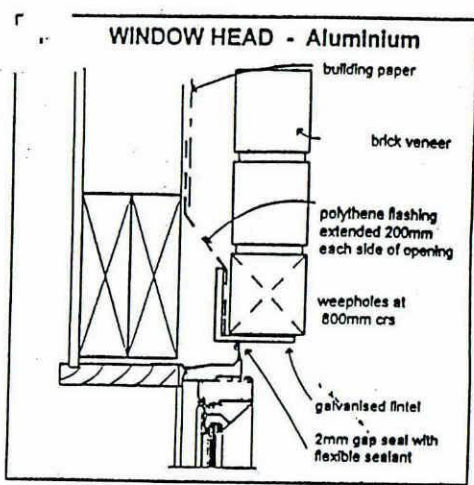
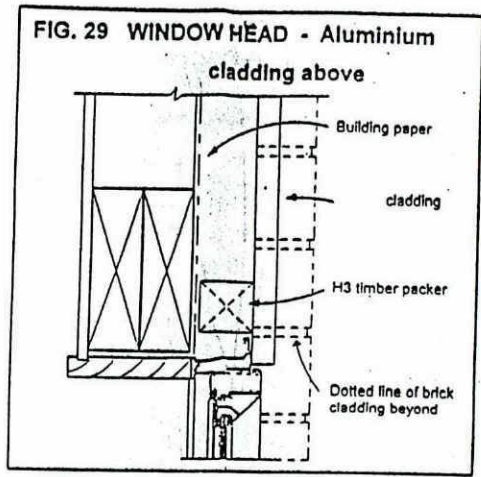
STANDARDS

All galvanised steel lintels to NZS3604. All work and materials to NZS3604, 4203, 4210, 4229, 4230.

Framing Guide

H5 for house piles + verandah posts in ground





JOB TITLE	
DRAWING TITLE BRICK VENEER DETAILS	
SALES	
DRAWN	
CHECKED	
JOB No.	SHEET No.

Two Part Bathroom & Balcony

PRODUCT DESCRIPTION

Superflex Two Part Bathroom & Balcony is a fast drying two component waterproofing membrane specifically designed for use under tiles. The product has been uniquely formulated with microfibrils to increase its strength and eliminate the need for a separate reinforcement mat. Superflex Two Part Bathroom & Balcony is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification, even in fully immersed situations. Superflex Two Part Bathroom & Balcony is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives.

Superflex Two Part Bathroom & Balcony has been tested and passed by CSIRO Building Systems Appraisal Council, an independent national testing authority.

FEATURES/BENEFITS

- Fast drying – Ready to tile in 24 hours (@ 23°C, 50%RH)
- Liquid reinforced – High strength, eliminates need for reinforcing mat
- Flexible – Accommodates normal building movement
- Advanced acrylic polymers – Will not re-emulsify (even under constant immersion)
- Designed for tiling systems – Fully compatible with Ardex tile adhesives
- Water based – Safe to use, low odour & easy cleaning

APPLICATION RANGE

Performance Levels

Commercial and residential

Location

Internal wet areas, balconies, decks, and other areas that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls & floors

Substrates

Concrete	Cured for min. 28 days
Renders and screeds	Cured for min. 7 days
Fibre cement sheets	Suitable for wet conditions
Plasterboard	Wet area grade only

Not suitable for use directly over treated pine, rigid fibre-glass or epoxy, or other totally impervious substrates. Contact Ardex for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

The waterproofing membrane shall be Superflex Two Part Bathroom & Balcony: a two component cementitious acrylic modified membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Two component 20kg liquid pail/2 X 10kg bags powder;
10kg liquid/10kg bag powder.

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23° C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within 3 months.

COVERAGE

A mixed unit of 20kg liquid/2X10kg powder will cover around 20m² (based on two coats, applied at a wet film thickness of 1.0mm per coat). Coverage will vary depending on the condition of the surface.

DRYING TIMES

Recoat time

1-2 hours (at 23°C/50% RH) between first and second coats. Alternatively, if a polyester mat is used between coats then the second coat can be applied whilst the first coat is still wet.

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry. The membrane is totally dry in 24 hours at 23°C/50% RH, but can take up to 48 hours at 10°C/50% RH.

Fully cured

The shower should not be used until the membrane has reached its full strength. The membrane is fully cured 3 days after it has been applied at 23°C, or after 5 days at 10°C. Drying times will vary depending on humidity, temperature and surface porosity. Do not apply on substrates where the surface temperature is below 10°C or above 35°C.

CLEANING

Wash hands, brushes, rollers, etc, with water while the membrane is still fresh. Remove cured material with mineral turpentine.

PRECAUTIONS

Do not use the product in the following situations:

- areas subject to negative hydrostatic pressure or rising damp
- where the substrate is wet or rain is imminent
- where the membrane will be left exposed and subjected to regular foot traffic
- on glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants)
- where the surface temperature is below 10°C or greater than 35°C

All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to tiling. For substrates or situations other than those listed contact Ardex.

SAFETY DATA

Superflex Two Part Bathroom & Balcony is non-toxic. However, the contents should not be swallowed or inhaled. In case of eye contamination, rinse thoroughly with clean water. If irritation continues seek medical advice.

QUALITY PRODUCT

Superflex Two Part Bathroom & Balcony is manufactured and tested to Ardex procedures which are maintained in accordance with Quality System Standard ISO 9001. Material Safety Data Sheets are available from Ardex upon request.

USER NOTES

The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is the responsibility of the user to ensure that the product is used in accordance with Ardex instructions and in applications for which they are intended.

APPLICATION TOOLS

Apply Superflex by brush or roller. We recommend using a medium nap (8-12mm pile) paint roller. New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Superflex

Under Tile Membranes

Fig.1 – Shower Recess – Critical Areas

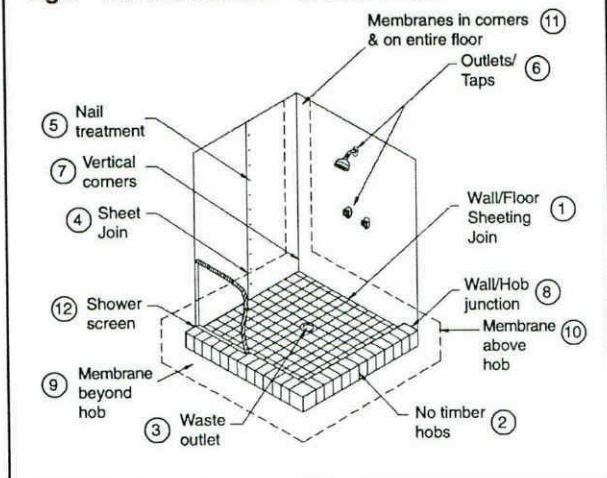
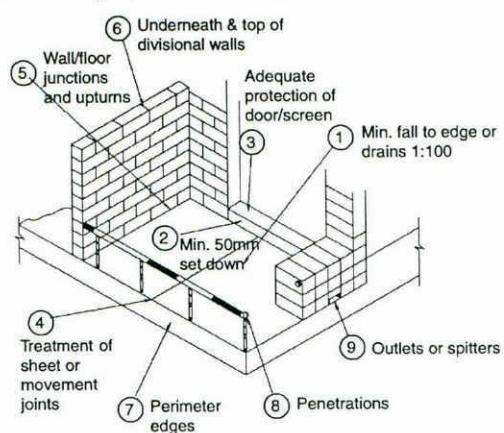


Fig.2 – Balcony – Critical Areas



INTERNAL WET AREAS

- ensure wall & floor sheets are installed as per sheet manufacturers recommendations, with a 5-6mm gap between the bottom of the wall sheet and the floor
- ensure suitable brick/concrete hobs are used (do not use timber), and that the top of the hob does not slope outwards
- ensure that falls to the waste in the shower recess are min 1:60 (ie. 25mm in 1.5m) before waterproofing
- ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor
- avoid sheet joints in shower recess floor
- ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are treated with silicone sealant or PVC duct tape
- treat nail and screw holes with silicone sealant
- seal the perimeters of taps, shower outlets and waste outlets with silicone sealant
- apply a bead of silicone sealant to all horizontal and vertical corners
- apply a bead of silicone sealant to the junction of the hob or angle and walls
- apply the membrane to the entire shower recess floor and down into waste or onto the drainage flange
- apply the membrane over the hob and at least 100mm beyond the outside edge of the hob (ideally to entire wet area floor)
- apply the membrane 1800mm up the walls or 80mm above the height of the shower rose (whichever is the greater)
- install the shower screen to inside edge of the hob

BALCONIES AND DECKS

- ensure that the deck is constructed with falls to edge/ drains of min 1:100 (ie. 20mm in 2m) or else achieve the fall with a sand/cement screed
- ensure a min set down (step down) of 50mm to the finished floor level (ie. top of tiles)
- ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/ sliding door
- treat any sheet joints with silicone prior to water proofing
- prepare and seal all wall/floor junctions with a bead of silicone
- apply the membrane up the step down and as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door)
- where possible, apply the membrane prior to building divisional walls
- apply the membrane to the entire balcony floor and at least 50mm up the wall (or to the first course of bricks)
- apply the membrane to the top of the parapets and divisional walls, or else install suitable metal capping

- apply the membrane down over the front edge of the balcony onto the drip rail
- carefully seal any gaps around balcony penetrations prior to applying the membrane
- apply the membrane down into outlets and drains, ensuring excess material is removed

MIXING INSTRUCTIONS

Mix the liquid and powder at a ratio of 1:1 by weight (ie. 10kg liquid to 10kg powder). Mix with a slow speed mechanical stirrer until there are no lumps in the mixture. For best mixing results use a spiral or eggbeater paddle attachment. Allow the mix to stand for 5 minutes then re-stir before use.

APPLICATION NOTES

Surface preparation

- Ensure all surfaces are structurally sound and dry. All sheet substrates must be securely fixed in accordance with the manufacturers instructions.
- Falls to the outlets of at least 1:60 (25mm in 1.5m) in internal wet areas or 1:100 (20mm in 2m) for external decks should be created prior to tiling. If the falls have not been built into the substrate they must be achieved with a suitable sand/cement screed.
- The surface to be coated should be free from dust, oil, paint, curing compounds and any other contaminating materials.
- Damaged concrete should be repaired (levelled) and surface defects including all cracks and sharp protrusions should be treated prior to the application of the membrane.
- Remove laitance on concrete or screeds by mechanical means.
- Highly dense (>40MPa) or steel trowelled concrete should be roughened by mechanical means (shot blasting, grinding, etc).

Priming

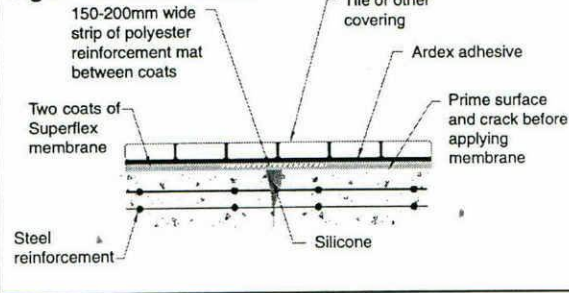
The primer is a critical part of the waterproofing system. Apply one coat of Superflex primer by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to be completely dry prior to the application of the Superflex membrane. This will take around 20-30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m² per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.

GENERAL APPLICATION

Crack Preparation

Cracks <2mm: clean and remove any loose particles in the crack. Prime the area carefully before covering the crack with two 300mm wide coats of Superflex Two Part Bathroom & Balcony.

Fig.3 – Crack Treatment



Cracks 2-6mm (Refer Fig.3): prepare and prime the crack as above. Apply a bead of neutral cure silicone into the crack and extend it 5mm either side. Apply a 300mm wide band of Superflex Two Part Bathroom & Balcony along the entire length of the crack. Place a 200mm wide band of polyester reinforcement mat into the wet membrane. Remove any creases or air pockets in the mat. Immediately apply a second coat to completely fill the mat.

Cracks >6mm: contact your local Ardex representative.

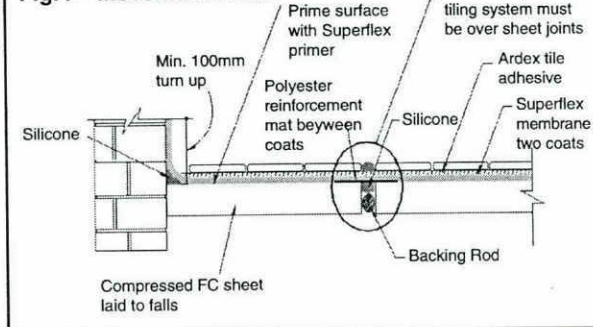
Movement/construction joints (Refer Fig.4)

Movement joints (<6mm): clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 5mm each side of joint. Apply a 300mm wide band of Superflex Two Part Bathroom & Balcony along the entire length of the joint and whilst still wet install a 200mm wide strip of reinforcing mat into the membrane. Whilst still wet apply a second coat of the membrane removing any air pockets in the mat.

Construction joints (>6mm): use the same procedure as above, but replace the reinforcing mat with the Superflex Joint Bridging Band.

Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint

Fig.4 – Movement Joints

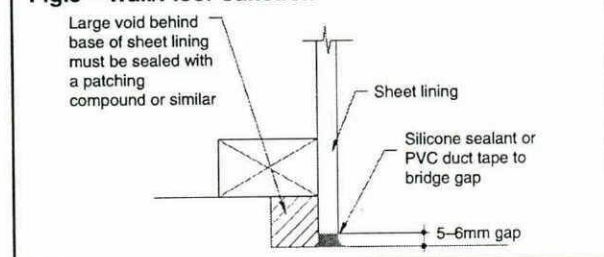


sealant.

Corners & coving areas (Refer Fig.5)

After priming apply a generous bead (10mm) of neutral cured silicone sealant in coving areas and corners. Smooth over the silicone so that it extends 5mm up the wall and 5mm over the floor. Apply a first coat of Superflex Two Part Bathroom & Balcony to the area and allow the membrane to

Fig.5 – Wall/Floor Junction



dry. Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be around 1.2-1.5mm).

Alternatively, if a polyester reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

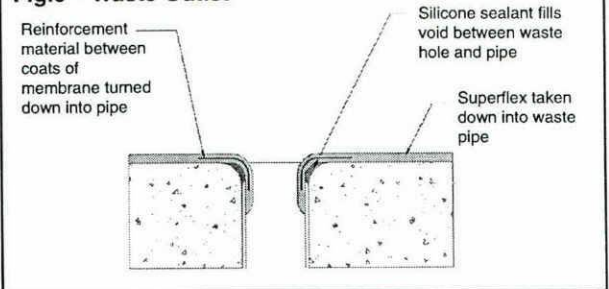
Walls

After priming apply two coats of Superflex Two Part Bathroom & Balcony in two opposite directions on vertical surfaces. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate flashing. Allow the first coat to dry before applying the second coat.

Floors (Refer Fig.6)

Two coats of Superflex Two Part Bathroom & Balcony are required to achieve the correct dry film thickness of 1.2-1.5mm. Apply the first coat over the primed surface and allow it to dry (1-2 hours at 23°C, 50%RH) before applying a second coat in an opposite direction. Ensure that the membrane is taken down into the waste or drain, or onto the puddle flange. Again a reinforcement mat can be used

Fig.6 – Waste Outlet

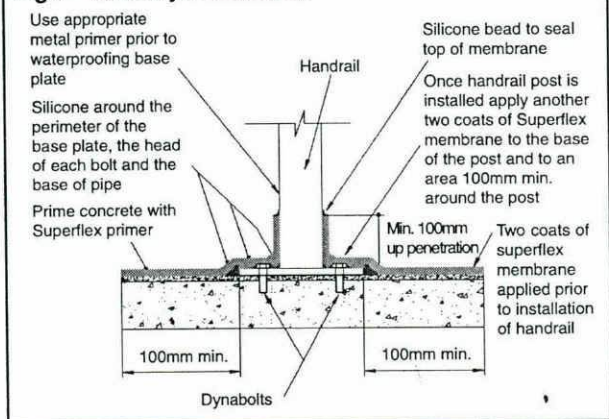


between coats if desired.

Balcony penetrations (Refer Fig.7)

Place a suitable flanged metal upstand around the penetration. Prime the metal with an appropriate metal primer and allow to dry. Apply a 10mm bead of silicone around the perimeter of the penetration. Apply the first coat of Superflex Two Part Bathroom & Balcony on the substrate and the flanged metal. Allow first coat to dry before applying a second coat ensuring a finished dry film thickness of no less than 1.2mm is achieved. Place a suitable flashing collar around

Fig.7 – Balcony Penetration



the penetration sealing it with a suitable sealant.

Tiling systems

Allow the membrane to be dry through before tiling. It is advisable to conduct a flood test of the shower once the membrane is cured (normally after 3 days), and before the tiling commences. A broad range of ABA tile adhesives can be used over Superflex membranes. Contact Ardex or your nearest ABA merchant for advice on the most suitable system.

Superflex

Under Tile Membranes

TECHNICAL DATA

Characteristics of components

Form & Colour:	Liquid: white, medium viscosity
	Powder: off white

Characteristics of mixed product

Mixing Ratio:	1:1 by weight
SG of mixed product:	1.44kg/litre
Non Volatile Matter	77±1
Colour:	light green

Characteristics of cured membrane

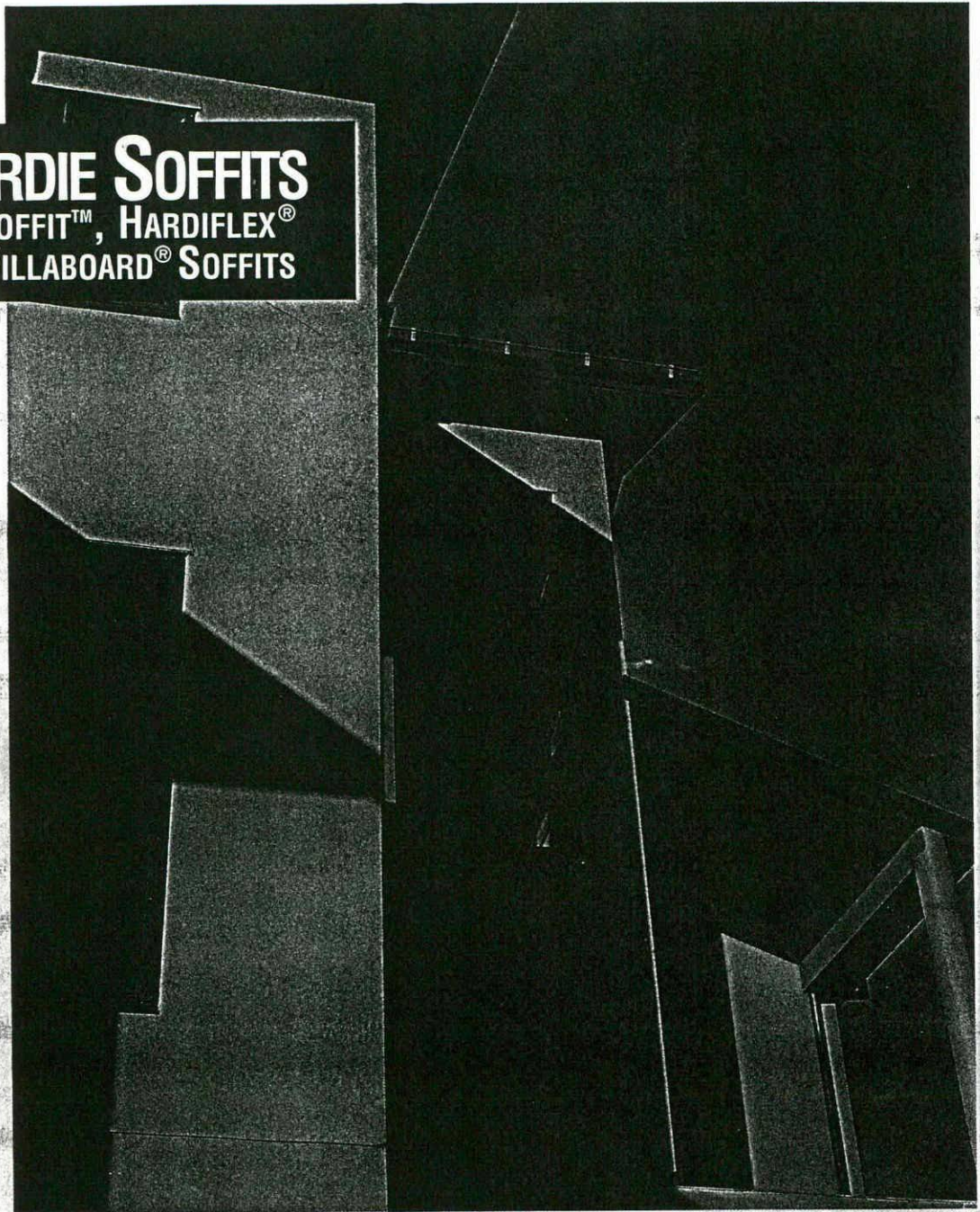
Shore A hardness	ASTM D2240
– dry film	85 – 90
– wet film	75 – 80
Water Absorption:	AS A121 App K 4.3%
Tensile Strength	
28 days dry	AS1145 1.8 MPa
Elongation at Break	
28 days dry	AS1145 >200%

NOTE: Most of the tests have been carried out in the Ardex laboratory under standard conditions (23±2°C, 50±5% R.H)



**James Hardie
Building Products**

JAMES HARDIE SOFFITS
INCLUDING HARDISOFFIT™, HARDIFLEX®
SILKLINE™ AND VILLABOARD® SOFFITS



May 1997

*Control the weather and enhance
your design possibilities by adding
creative soffits, from James Hardie,
to a building or home.*

JAMES HARDIE TECHNICAL INFORMATION

SECTION 1: GENERAL

General information

Product description

Hardisoffit™, Hardiflex®, Silkline™ and Villaboard® are sheet materials manufactured by James Hardie from fibre cement which is a composition of treated cellulose fibre, Portland cement, finely ground sand and water. Following forming into sheets the product is cured by high-pressure steam autoclaving.

Hardisoffit™ and Hardiflex®

Hardisoffit™ 4.5mm thick is used as a residential perimeter soffit.

Hardiflex® 4.5mm is used as a residential soffit and 6.0mm as a heavy-duty commercial soffit.

Hardiflex® and Hardisoffit™ are identified by the name 'HARDIFLEX®' or 'HARDISOFFIT™' printed on the reverse face of the sheet.

The sheets have an off-the-machine unsanded face surface suitable for a range of coatings. High-gloss finishes must be avoided as these are not suitable for unsanded sheet surfaces.

Silkline™

Silkline™ is a 4.5mm-thickness sheet used for residential and commercial soffits. The product is fully face-sanded to a smooth finish and is pre-finished with a high-quality paint. The name 'SILKLINE™ SOFFIT' is printed on the reverse face.

Silkline™ soffit is used for the lining of soffits, eaves, verandahs, carports and porches. It can also be used in any ceiling area where a pre-finished, easy-clean surface is required. Examples are spa pools, laundries and garages.

Villaboard®

Villaboard® is a 6mm and 9mm-thickness smooth sanded sheet which can be jointed and finished with a range of paint finishes.

The sheets are a light grey colour. The face side only has a smooth, matt finish, fully sanded and clear acrylic sealed. The reverse side is slightly dimpled. The name 'VILLABOARD®' is printed across the reverse side at regular intervals.

This product is for interior use or soffit applications only. It must not be used for external wall applications.

New Zealand Standard

Hardisoffit™, Hardiflex®, Silkline™ and Villaboard® are manufactured to conform to NZS/AS 2908.2:1992 Cellulose Cement Products – Flat Sheets.

Installation – technical details

Hardisoffit™, Hardiflex®, Silkline™ and Villaboard® must be installed in accordance with this specification.

Structural ceiling diaphragms

Hardiflex® and Villaboard® comply as structural ceiling diaphragms with Clause 12.5 NZS 3604:1990.

Villaboard® can be used for specific design ceiling diaphragms. Refer to James Hardie for full details: phone 0800 808 868.

Curved applications

Villaboard® can be used for curved applications and the following are the minimum recommended radii for concave and convex fitted sheets. The sheet must be bent only along the length.

6mm thickness	900mm
9mm thickness	1200mm

NOTE: Commence fixing from the centre of the sheet and work outward to avoid any possibility of drumminess. Ceiling framing spacing must be closed up to 400mm centres for extra sheet support to hold the curve.

General framing and fixing requirements

Correct design of the framework and correct sheet fixing will contribute significantly to the success of all James Hardie soffit and ceiling systems.

The following principles must be applied:

For all sheet fixing systems the centre line of the joint is to be located on the centre line of the ceiling framing or joist. This is to ensure sufficient edge clearance for the fixing of adjoining sheets along the sheet edges. This is very important when narrow kiln-dried framing is used, as tolerances are at a minimum.

All sheets must be dry before fixing to framing. This is particularly important for Villaboard® flush-jointed systems as extra drying shrinkage can occur, causing joint cracking.

All sheet edges must be fully supported. Framing must be rigid and not rely on the sheets for stability. The only exception to this is the one-way commercial Villaboard® ceiling (refer page 24).

Fix the sheet from the centre working towards the outside to avoid drumminess.

Ensure the sheet is held hard against the framing during nailing or screwing to minimise break-out in the back of the sheet.

= d[∞]

Table 1: Support framing centres

Celling joist centres (mm)	Max. nogging centres (mm)
450	Not required (one-way span)
600	1200
750	1200
900	600
1200	600

To fix larger soffit, ceiling or verandah applications provide a perimeter frame to all sheet edges (except for 450mm centres) and intermediate nogging at the centres shown in Table 1.

Do not fix closer than 12mm to the sheet edge or 50mm to the corner of the sheet.

The sheets must not be fixed into position before the roof is made watertight.

Refer to Section 5 for fixing durability and use of stainless steel nails in areas with very severe climatic conditions.

Fastfix fasteners

Nylon Fastfix fasteners 38mm long (refer Table 3, page 10) colour-matched to the Silkline™ soffit system can be used as an alternative fixing for all soffit and ceiling systems. Drill a 6mm-diameter hole through the sheet and timber or steel framing to insert the Fastfix fastener. For timber the hole must be 40mm deep.

Adhesive fixing

Fixings can be finished flush or sunk a maximum of 0.5mm below the sheet surface ready for filling.

Where adhesives are used for fixing in conjunction with nails or screws, Fosroc Construction Adhesive SB, Fullers Maxbond™ or an equivalent is used.

Do not place adhesive at sheet perimeters.

After screw or nail fixings are in place, ensure that all adhesive daubs have full contact between the lining

and framing members by striking the board with the hand at each daub.

If required, use temporary holding pads to ensure good contact to framing. Pads are to be removed after 24-48 hours depending on drying conditions.

Batten requirements

Battens for fixing the sheets are required when sheets are fixed over:

- Gypsum board exceeding 20mm in thickness
- Softboard, polystyrene or similar
- Concrete, masonry block or brick.

Battening specification

Timber battening is to be a minimum of ex 35mm wide x 40mm gauged timber to give adequate sheet nail penetration.

Steel battens are to be a minimum of 72mm wide x 23mm deep x 0.5mm thick and have a bearing surface of 37mm. Battens must be galvanised steel (275 g/m² zinc coating) and fixed to manufacturer's specifications.

All battening centres and sheet fixing is to be strictly in accordance with the framing and fixing required by this specification. Care must be taken to ensure the battens are packed and aligned to give a true even surface for the sheets to be fixed. Check the face of the battens with a long straight-edge before fixing sheets.

Timber frame

Timber framing must be in accordance with NZS 3604:1990 Code of Practice for Light Timber Frame Buildings Not Requiring Specific Design.

Specific Design to NZS 3603:1993 and NZS 4203:1992 can also be undertaken providing that:

- the framing centres do not exceed those given in this specification
- the framing member widths conform to this specification.

Kiln-dried radiata is preferred. Sheets must not be fixed to timber

framing with a moisture content in excess of 18%.

Timber framing must be either ex 50mm wide or, when kiln-dried is used, 45mm minimum.

Nail fixing

Fix Hardisoffit™, 4.5mm and 6mm Hardiflex®, Silkline™ concealed fixings and 6mm and 9mm Villaboard® with 40mm x 2.8mm Hardiflex® nails. Refer to the relevant figures for nail spacing. Refer to Table 3, page 10, for the nail details.

NOTE: All nail fixings are to be driven flush with the sheet surface. Overdriven nails can cause pull-through and underdriven nails spoil the appearance. The only exception to this is for Villaboard® when the nails are to be flush-stopped. They can then be driven a maximum 0.5mm below the surface (refer page 16).

Wood screws

An alternative fixing for 6mm Hardiflex® and 6mm and 9mm Villaboard® is the Villadrib Envirodrab wood screw. Refer to Table 3, page 11, for details and to the relevant figures for fixing details.

Steel frame

The details in this brochure are drawn for timber framing. However, metal framing and furring channels can be used.

All metal framing centres are to be the same as the relevant timber frame specification.

Steel framing members must be fabricated from light-gauge sheet steel 0.55mm thick minimum to 1.6mm maximum. If heavier sections are used difficulties may be experienced in fixing the self-drilling, self-tapping fasteners. Refer to specific details for the minimum flange width requirements.

Sheets must not be fixed directly to drawn steel or hot-rolled steel sections which must first be battened out with ex 50mm-thick (40mm

minimum) timber battens or light-gauge metal furring channels.

Screw-fix to 0.8mm to 1.6mm metal frames with 6g x 25mm self-embedding-head Villadrive Envirodrab screws (refer Table 3, page 11).

Screw-fix to 0.55mm to 0.8mm metal frames with Villadrive wood screws (refer Table 3, page 11) as these work very well in the lighter steel.

NOTE: These fixings are not to be used with 4.5mm-thickness material.

Fixings can be finished flush or sunk a maximum of 0.5mm below the sheet surface ready for filling.

NOTE: Villadrive Envirodrab screws must not be used in very severe coastal conditions. (refer page 27).

Product information

Hardisoffit™, Hardiflex®, Silkline™ and Villaboard® sheets are lightweight fibre cement substrate which is resistant to permanent moisture damage, and will not rot or burn. The sheet is securely fixed to the timber framing by nailing, or to steel framing by fasteners.

Any special conditions or unusual applications must be referred to the technical staff of James Hardie Building Products Ltd. Phone the James Hardie Helpline: 0800 808 868.

Hardisoffit™

Hardisoffit® sheet sizes				
Thickness (mm)	Length (mm)	Width (mm)		
		450	600	750
4.5	2400	✓	✓	✓

NOTE: All dimensions are nominal

Sheet edge finish

Hardisoffit™ sheets are supplied with a square-cut edge.

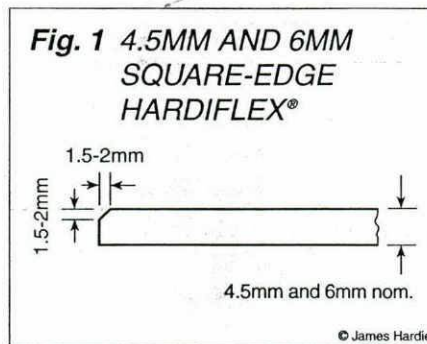
Hardiflex®

Hardiflex® sheet sizes					
Thickness (mm)	Width (mm)	Length (mm)			
		1800	2400	2700	3000
4.5	900		✓		
4.5	1200	✓	✓	✓	✓
6	900		✓		
6	1200	✓	✓	✓	✓

NOTE: All dimensions are nominal

Sheet edge finish

The four sheet edges are saw cut to give a neat square finish with a small bevel (refer Fig. 1)



Silkline™

Silkline™ sheet sizes

Thickness (mm)	Length (mm)	Width (mm)				
		450	600	750	900	1200
4.5	2400	✓	✓	✓	✓	✓

NOTE: All dimensions are nominal

Sheet edge finish

Silkline™ sheets are supplied with a square-cut edge.

Villaboard®

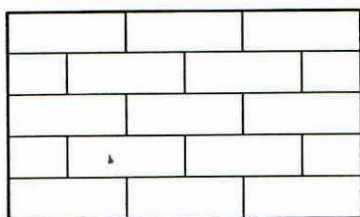
Sheet selection

Refer to Table 2. For all applications where a smooth continuous joint-free surface is required use only fully stopped recessed-edge sheets. For single-sheet applications or where all sheet joints are expressed or PVC jointed, square-edge sheets must be used.

Table 2: Villaboard® sheet sizes						
Thickness (mm)	Width (mm)	Length (mm)				
		2400	2700	3000		
Four-edge stepped recess (all four edges recessed)						
6	900	✓				
6	1200	✓			✓	
9	1200	✓			✓	
Three-edge stepped recess (two short edges and one long edge recessed)						
6	1200				✓	
9	1200				✓	
Two-edge stepped recess (two long edges recessed)						
6	1200	✓	✓			
9	1200		✓	✓		
Square edge (small bevel on four edges)						
6	900	✓				
6	1200				✓	
9	1200		✓	✓		

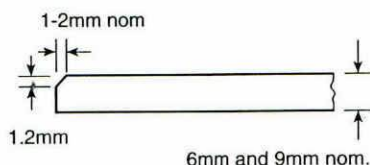
NOTE: All dimensions are nominal

Fig. 2 FOUR RECESSED EDGES



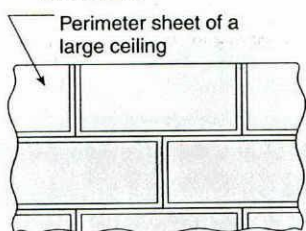
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Fig. 6 6MM AND 9MM SQUARE-EDGE VILLABOARD®



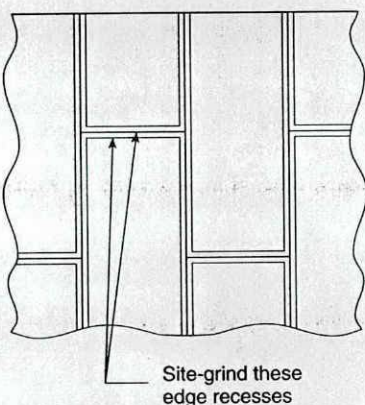
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Fig. 3 THREE RECESSED EDGES



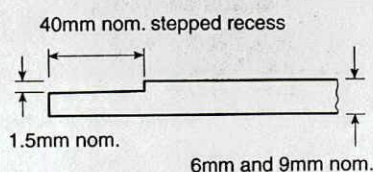
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Fig. 4 TWO RECESSED EDGES



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Fig. 5 6MM AND 9MM RECESSED-EDGE VILLABOARD®



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Sheet usage

Four recessed edges (refer Fig. 2): use for large ceilings and soffits requiring recessed edges on four sides of the sheet.

Three recessed edges (refer Fig. 3): use for ceilings where recess is not required at the perimeter.

Two recessed edges (refer Fig. 4): use at the perimeter of a large ceiling.

Square edge: use for sheets with expressed, sealant or PVC joints.

Sheet edge finish

Recessed-edge sheets

The sheet edges are step-recessed and clear acrylic sealed to accept a paper reinforcing tape, bedding compound and a finishing compound (refer Fig. 5).

Square-edge sheets

The four sheet edges are saw cut to give a neat square finish with a small bevel (refer Fig. 6).

Sheet mass and moisture content

The Hardisoffit™, Hardiflex®, Silkline™ and Villaboard® sheets are defined as having an equilibrium moisture content (EMC). The sheet is at EMC under conditions of 25°C and 55% relative humidity.

Approximate sheet mass at EMC

	Thickness (mm)	Mass (kg/m ²)
Hardisoffit™	4.5	5.9
Hardiflex®	4.5	5.9
	6	7.8
Silkline™	4.5	5.9
Villaboard®	6	8.3
	9	12.4

NOTE: Dry sheets vary in moisture content with the seasons and prevailing weather conditions. As a guide, a dry sheet can vary between 6% moisture content in summer and 14% in winter.

Fire properties

James Hardie fibre cement building products will not burn and have the following Early Fire Hazard Indices (tested to AS1530 Part 3 1983).

Ignition Index	0
Flame Spread Index	0
Heat Evolved Index	0
Smoke Developed Index	0-1

Note: Zero is the best possible result.

Working instructions

Handling and storage

It is essential to store the soffit sheets under cover and to keep dry prior to fixing.

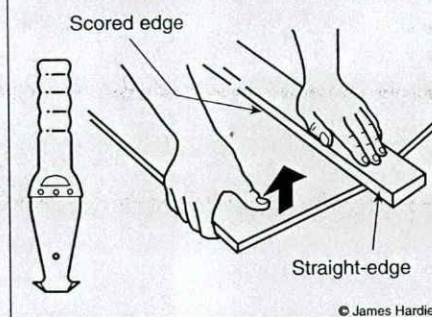
Sheets must be stacked on a smooth level surface. Edges and corners must be protected from possible damage. Carry sheets on edge.

Silkline™ sheets are packed face to face with paper interleavers.

Cutting

Suitable cutting methods are 'score-and-snap', hand guillotine, hand sawing and diamond saw.

Fig. 7 SCORE-AND-SNAP METHOD



Score-and-snap

Score-and-snap is a fast and efficient method of cutting using the James Hardie special tungsten-tipped score-and-snap knife (refer Fig. 7).

- Preferably score from the face side of the sheet.
- Position straight-edge along the line of the cut.
- Score against straight-edge and repeat the action to obtain adequate depth for a clean break – normally one-third of sheet thickness.

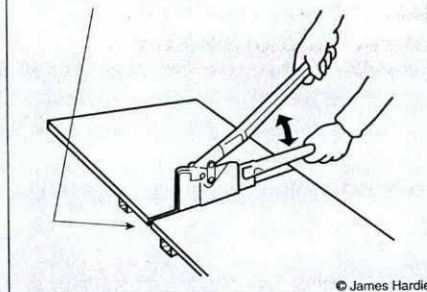
- Snap upwards to achieve break.
- Clean up edges with a rasp if necessary.

Hand guillotine

The Jiffy brand hand guillotine produces clean, straight edges. Make the guillotine cut on the off-cut side of the line to allow for the thickness of the blade (refer Fig. 8).

Fig. 8 HAND GUILLOTINE METHOD

Pack sheet off the ground



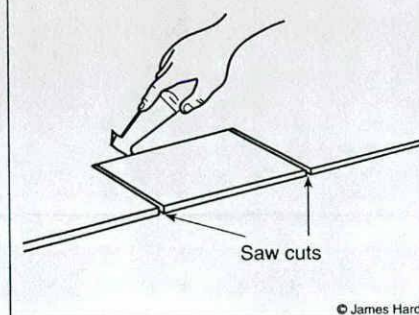
Hand sawing

Hand sawing is suitable for general cutting operations and for small cuts, notchings or small penetrations.

Preferably use an old handsaw. A quick forward jabbing action is best.

For neatness, mark out the cuts to be made on the face side of the sheet. Where small notches are to be made, cut the two sides with the handsaw or hand guillotine, score along the back with the 'score-and-snap' knife and snap upwards. (Refer Fig. 9.)

Fig. 9 HAND SAWING METHOD



Power sawing and hole forming

Safety precautions

When cutting, drilling or grinding, safety glasses and a dust mask must always be worn. This can be either a disposable P2 dust mask or a half mask with a disposable cartridge. The mask must fit properly and be approved for use with dust. The mask must be repaired or replaced as necessary and cleaned often.

All dry power-cutting operation must be carried out in open-air situations or in well ventilated spaces and dust extraction equipment must be fitted to the dry-cutting tool.

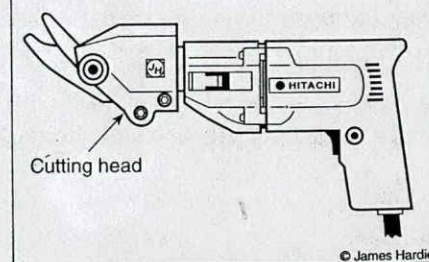
All aspects of wet and dry cutting must comply with the latest regulations of the Occupational Safety and Health (OSH) division of the Labour Department.

Power sawing

Power cutting using a dry diamond saw blade gives an acceptable edge.

Clamp a straight-edge to the sheet and run the saw base plate along the straight-edge when making the cut.

Fig. 10 HARDISHEAR™ POWER CUTTER



Hardishear™ power cutter

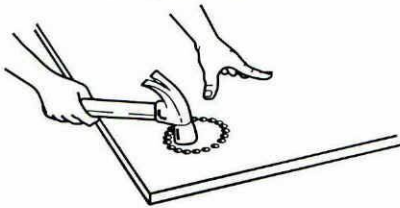
A Hardishear™ power-cutting tool can be used for 4.5mm, 6mm and 9mm sheets. (Refer Fig. 10.)

For details and availability of the Hardishear™, enquire at a James Hardie distributor or call 0800 808 868.

Hole forming

Small rectangular or circular holes can be achieved by drilling a series of small holes around the perimeter of the hole then tapping out the waste pieces from the sheet face. Tap carefully to avoid damage to sheets and clean rough edges with a rasp. (Refer Fig. 11.)

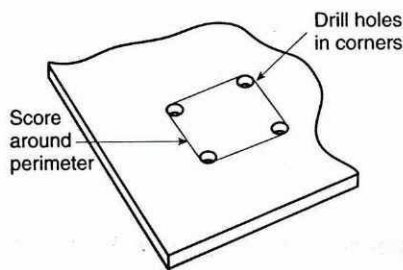
Fig. 11 CIRCULAR HOLE FORMING



Note: Do not form holes through sheets with cold chisels, heavy hammers or any other 'aggressive' methods. Such forceful methods will damage sheets and may cause other problems at a later date.

© James Hardie

Fig. 12 RECTANGULAR HOLE FORMING



© James Hardie

Large rectangular openings, such as for ceiling ventilators, can be made by the following method:

- Mark out the hole on the face side of the sheet.
- Drill a hole in each corner as shown in Fig. 12.
- Score to the outside of the holes to half the sheet depth.
- Turn sheet over and score the reverse face to half the depth using the drilled holes as a reference.
- Knock out the scored material to form the hole and clean up with a rasp if necessary.

For smooth, clean-cut circular holes:

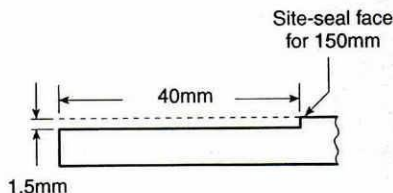
- Mark the centre of the hole on the sheet.
- Pre-drill a 'pilot' hole.
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a tungsten-tipped ring cutter fitted to a heavy-duty electric drill. Sandvik ring-cutting kits or similar are available for this purpose.

Site recessing Villaboard® only

Where it is necessary to produce a Villaboard® ground recess detail on site (refer Fig. 13), use a Hitachi Easy Bevel fitted to a vacuum cleaner (refer to information on inside back cover).

For further details call the James Hardie Helpline: 0800 808 868.

Fig. 13 SITE-GROUND RECESS DETAIL



Note: Seal site-ground recess with a PASS-approved (paint approval system) water-based wallboard sealer.

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SECTION 3: RESIDENTIAL & SMALL COMMERCIAL SOFFITS

Framing, fixing and jointing procedures

Refer to Section 1, pages 4-6, for general framing and fixing requirements.

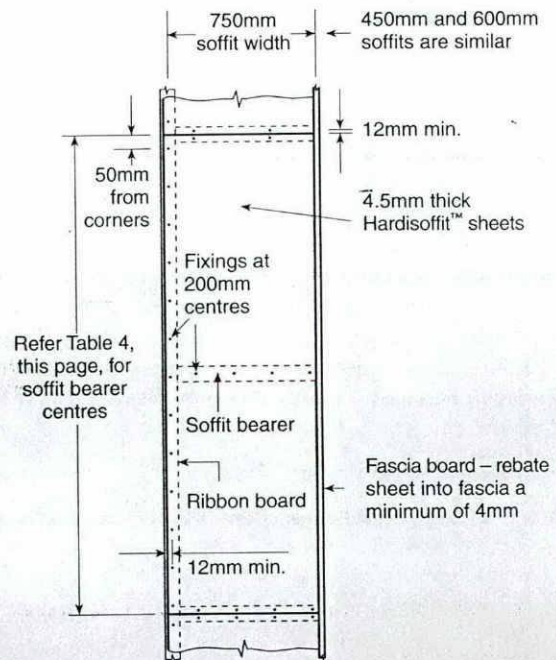
Hardisoffit™, Hardiflex® and Silcline™ soffits and ceilings

Hardisoffit™ system

For lining standard soffits up to 750mm wide, 4.5mm-thick Hardisoffit™ sheets can be used. For wider soffits and verandahs refer to 'Hardiflex® soffit system', below.

All sheet edges are to be supported by framing or a fascia board. Fixings are to be at 200mm centres to all framing (refer Fig. 29).

Fig. 29 HARDISOFFIT™ FRAMING



Notes:

1. Hardiflex® nails are the usual fixing method for Hardisoffit™ sheets. The Fastfix method can also be used as an alternative.
2. When Fastfix fastenings are used refer to Table 3, page 10 and Figs 36 and 38.

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Table 4: Hardisoffit™ framing centres

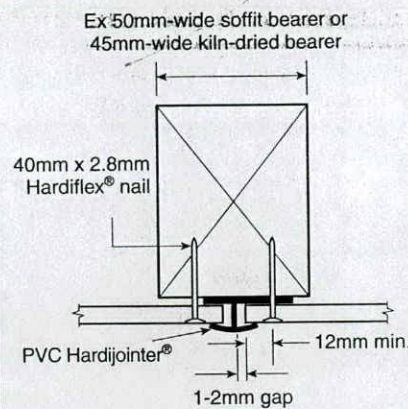
Soffit width (mm)	Max. soffit bearer centres (mm)
450	1200
600	1200
900	600

Sheet edges can be jointed with PVC Hardijointers or they can be left expressed. (Refer Figs 30 and 31.)

Hardiflex® soffit system

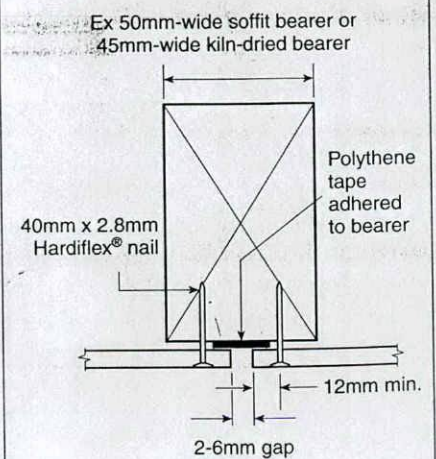
For wider soffits and verandahs Hardiflex® sheets 4.5mm thick are

Fig. 30 PVC HARDIJOINTER® DETAIL



© James Hardie

Fig. 31 EXPRESSED JOINT DETAIL



© James Hardie

SECTION 6: SURFACE FINISHES

This section covers the various paint coatings applied by independent contractors.

- These independent contractors are outside the control of James Hardie, therefore all warranties for performance of these finishing systems must be given by the selected contractors.
- The procedures and details given in Section 6 are a guide to good trade practice and the coatings are not covered by the James Hardie sheet warranties.

Painting

All James Hardie Hardisoffit™, Hardiflex® and Villaboard® sheets are to have a minimum of two coats of acrylic paint applied after fixing in order to meet the requirements of the New Zealand Building Code. These durability requirements cover the total framing and lining system, therefore to meet the durability requirements for timber or steel frame and inside lining, all sheets must be coated within 3 months of erection.

Acrylic paints

Use only quality 100% acrylic paints. Economy paints are not recommended because generally they are less well bound, less moisture resistant and more prone to mould growth.

In all cases the manufacturer's specification for the selected paint

must be followed. Note that some paints require an undercoat before applying finish coats.

Damp, shady situations, proximity to bush, agricultural paddocks or seaspray environments may induce an extra tendency to mould growth. Use mould-inhibiting and alkaline-resistant undercoats and consult the paint manufacturer for details of maximum mould-resistant paints.

Before painting, remove any surface grime or other contaminants and ensure the Hardisoffit™, Hardiflex® or Villaboard® is dry. Paint must not be applied when the air temperature is below 10°C.

When using PVC moulds avoid dark colours (light reflection below 40%) as excessive movement may cause buckling of the PVC when exposed to direct sunlight.

Specialist paints and enamel-based paints

Enamel-based paints can be used, utilising a three-coat system. For full details apply to the selected paint manufacturer before commencing the work.

Silkline™ soffit paint warranty

James Hardie warrants the paint coating on Silkline™ soffit for a period of 10 years from the date

of purchase against:

- *Cracking, peeling and flaking:* The paint coat will not crack, peel or flake.
- *Washability:* Dirt can be removed by washing without damaging the paint finish.
- *Yellowing:* The paint colour will not yellow due to age.
- *Chalk washdown:* The paint coat will not cause chalk stains on brick or other surfaces below the coating.
- *Erosion:* The paint film will not erode to expose the substrate.

This warranty applies only to Silkline™ soffit that has been fixed in accordance with James Hardie specifications and has been used in approved applications, i.e. as a soffit lining, and has been regularly maintained.

This warranty will not apply if damage or failure is caused by improper protection during transportation or storage, or impact damage after purchase.

If the product fails to conform to this warranty, James Hardie will rectify the problem. Proof of purchase must be supplied. This warranty is in addition to any remedies a purchaser may have under the Consumer Guarantees Act.

To make a claim under this warranty contact:
 Customer Services
 James Hardie Building Products Ltd
 PO Box 12070 Penrose, Auckland
 Phone 0800 808 805.

RECOMMENDED SAFE WORKING PRACTICES

Breathing in fine silica dust liberated when working with products such as fibre cement, clay and concrete is hazardous. Over time, usually a number of years, this may result in lung bronchitis, silicosis and lung cancer. **Work safely** with fibre cement sheets by following the precautions described below.

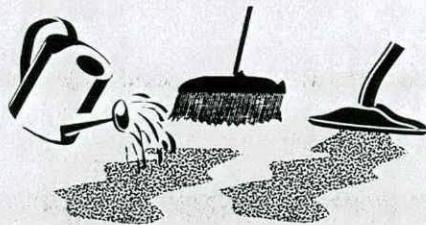
- Minimise dust when cutting sheets, by using either Score-and-Snap knife, Kwikrip™ hand guillotine, Heavy Duty Hardishears™ or Makita Wet Saw (Models 4101R and 4107R).



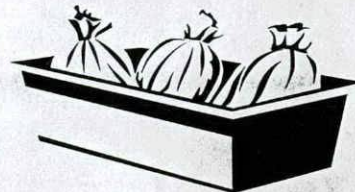
Face masks P1 or P2 Type



Safety goggles approved to AS 1337



Clean-up: wet down or vacuum



Disposal: containment of dust

- When using other power tools or abrasive hand tools, wear approved personal protective equipment, i.e., P1 or P2 dust mask and safety goggles.
- Ensure containment of dust during clean-up and disposal.

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

For more information contact James Hardie on 0800 808 868

CBI 5113

September 2003

GIB® Site Guide

Winstone Wallboards Limited

Auckland

37 Felix Street, P O Box 12256
Penrose, Auckland, New Zealand
Phone 64-9-633 0100, Facsimile 64-9-633 0101
Internet website: <http://www.gib.co.nz>
E-mail: info@gib.co.nz

Lower Hutt

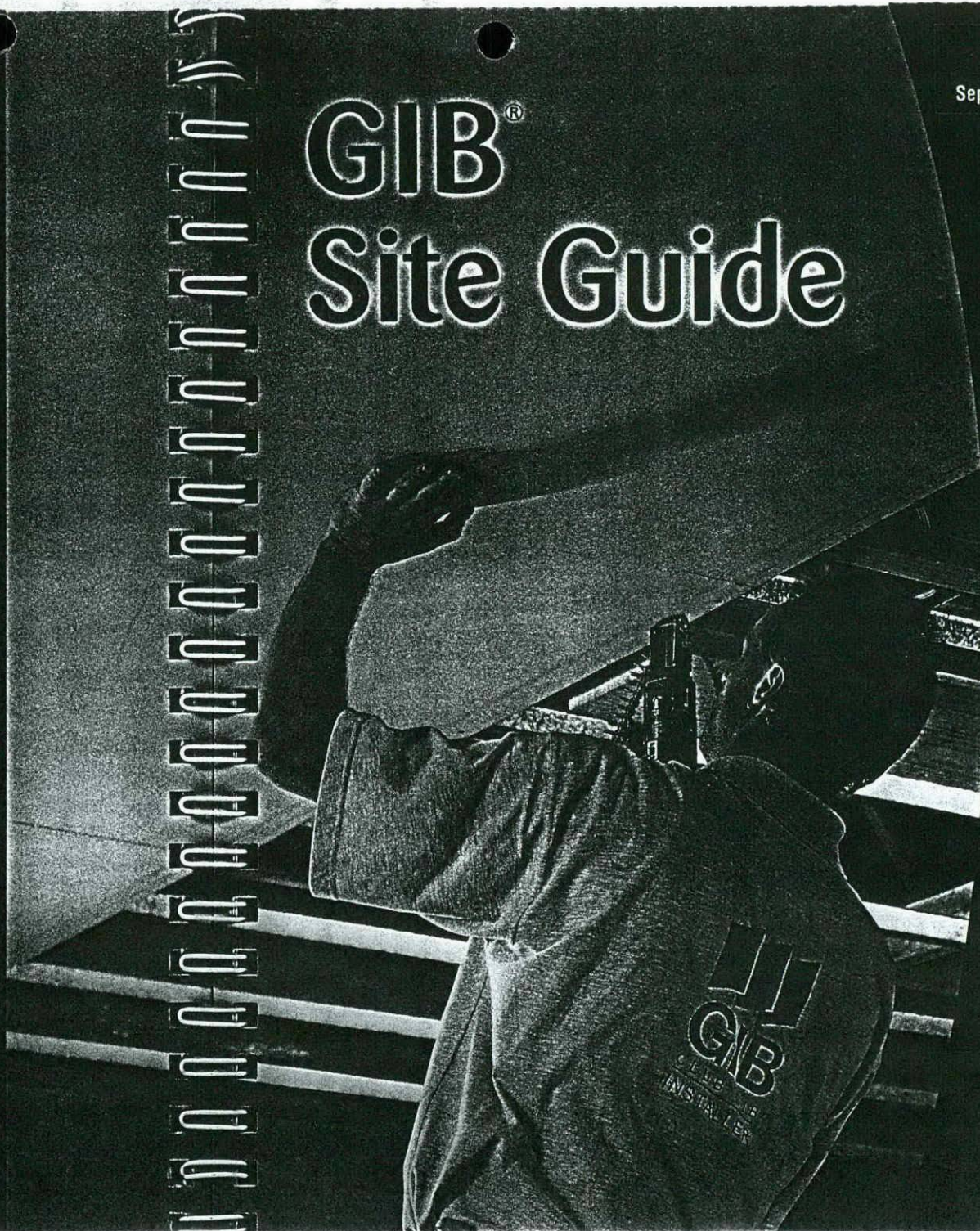
P.O. Box 36 024 Moera
Telephone 0-4-568 4293, Facsimile 0-4-568 7844.

Christchurch

P.O. Box 1983 Christchurch
Telephone 0-3-332 3159, Facsimile 0-3-337 1014.

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GIB® Helpline: Telephone 0800 100 442 Facsimile 0800 229 222



GIB

DESCRIPTION

Health and Safety

Under normal conditions of use, GIB® plasterboard presents no known health hazard. Careful lifting techniques must be employed to minimise risk of back injury.

- Plasterboard lifting machines are recommended for ceiling sheets. These can generally be hired from a local hire centre. If a plasterboard lifter is not available, ensure that adequate labour is on hand to assist.
- Knives used for scoring and snapping need to be sharp to operate effectively. Extreme care needs to be taken when using any cutting implements.
- Approved dust masks must be worn for all sanding of stopping compounds.
- Do not dispose of waste materials or compounds into any drainage system. Most local authorities will accept gypsum waste materials in landfills. If in doubt, check with your local authority.

Site Conditions

It is important to consider the impact of damp and cold site conditions on the finish quality once the building has been occupied and reaches equilibrium.

A minimum temperature (interior) of 10°C must be maintained during the plasterboard fixing process and a controlled heat of between 13-20°C must be maintained for 24 hours before, during and after the joint stopping operations. With concrete slab construction provide sufficient ventilation to minimise the build up of internal humidity which will increase the risk of sagging of plasterboards as well as delaying the project due to prolonged drying/curing of joint compounds. Failure to observe these requirements may result in framing and plasterboard surface defects.

Ordering and Delivery

At the time of ordering, consider specifying which sheet sizes are designated for walls and those for ceilings so that they can be placed in separate stacks.

With the extensive GIB® product range it is impossible for building merchants to stock all types and sizes of product. GIB® has a strong customer service promise to back up our merchant customers. Planning ahead will mean you can get exactly the products you require.

Deliver GIB® plasterboard to site immediately prior to installation to reduce the risk of damage.

GIB® plasterboard is a finishing product and needs to be handled as such. Lift sheets from the stack rather than dragging them. This reduces the risk of face paper damage.

Carry sheets on edge. This is easier than carrying them on the flat and sheets are less likely to crack or break.

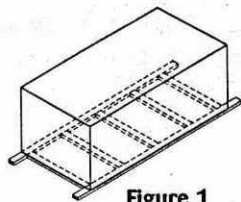


Figure 1

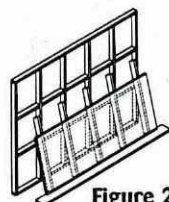


Figure 2

Stacking, Storage and Handling

- GIB® plasterboard must be neatly stacked to avoid sheet distortion, damage or moisture ingress. This can be achieved by stacking on a clean flat surface not susceptible to moisture. Sheets stacked flat on a concrete floor must be separated from the floor surface by a moisture barrier such as polythene sheet or placed on bearers (min 75 x 50).
- Consider floor loadings as GIB® plasterboard weighs in the range of 650-800kg/m². Stacks of 10mm board should be limited to 20 sheets on suspended floors to minimise the risk of structural damage through point loading. Prevent undue sagging or damage to edges, ends or surfaces during handling or storage. See Figures 1 and 2 for recommended methods of stacking and storage. Figure 2 method is not recommended for more than 8 sheets.

Protection from weather

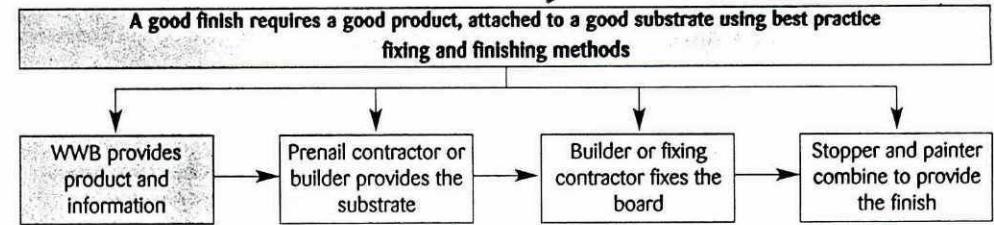
GIB® products must be kept dry preferably by being stored inside a building and under cover. Where it is necessary to store GIB® plasterboard outside, it must be stacked off ground and be fully protected from the weather.



Framing and Other Substrates

GIB® plasterboard is a relatively stable material when subjected to the normal range of temperatures and humidity experienced in NZ construction. The ultimate performance of a plasterboard wall or ceiling surface is heavily influenced by the substrate to which it is attached.

A good understanding of substrate performance coupled with some simple best practice installation techniques will help avoid finishing blemishes. Achieving a topclass finish is a team effort.



Typical substrates for plasterboard are:

- Timber framing
- Steel framing
- Concrete masonry
- Precast concrete
- Polystyrene blocks

Any substrate for GIB® plasterboard needs to be FLAT.

Common causes of not achieving a flat surface are:

- Bent studs
- Protruding nogs/dwangs
- Steel angle braces not set in flush with the surface of the framing
- Skew nails not driven home
- Inconsistent machining of timber frame especially at the stud/lintel connection
- Poorly assembled timber or steel framing
- Nail plates or hold down ties not set in flush with the surface of the framing
- Excess insulation forced into cavity
- Pipes or wiring not correctly set back into the cavity
- Screws in steel framing not countersunk flush
- Uneven blockwork surface

If any of these conditions exist they must be rectified prior to the installation of any board. These conditions apply equally for new and renovation work. An hour spent checking framing for any obstacles to achieving a flat surface reduces the risk of remedial work.

It is recommended to use a 1.8 - 2.0m straight edge to check the frame. See levels of finish guidelines on page 7 for tolerances. Any uneven timber framing can usually be planed flat with either a hand or electric plane. All nails must be driven fully home.

Ignoring any of these items before fixing any board is likely to result in surface defects.

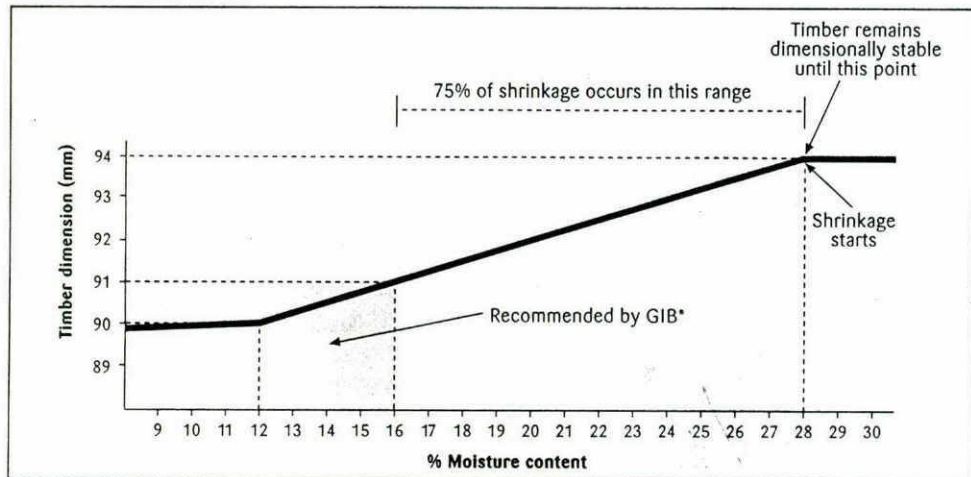
All timber framing is to comply with the requirements of NZS 3604:1999 and NZS 3602:1995.

GIB® recommends...

- The use of Kiln Dried Machine Stress Graded (KDMG) timber for all framing members including lintels and mid floor framing.
NB Mixing KDMG framing with non KD timber can cause excessive substrate movement and is not recommended.

Moisture content of timber framing must be between 12-16%

Timber Shrinkage Chart



From a moisture content of 28%, timber can shrink up to 1% for every 4% of moisture it loses until it stabilises at around 10-12%. GIB® plasterboard, correctly installed can generally handle the minimal amount of timber shrinkage that can occur between 12-16%. Fixing GIB® plasterboard to timber with moisture content in excess of 16% will increase the risk of surface defects such as peaking joints and popped fasteners.

Installation Checklist

If the Installation Checklist (page 27) is followed, the chances of remedial work will be greatly reduced. Exactly who carries out the checks is up to individual organisations. The object of a quality check is to encourage contractors to take responsibility for their part in the building process. It is important that the sign off name is clearly legible.

The completed checklist should be included in the job file for future reference.

This checklist can be photocopied or additional copies are available from GIB® Helpline 0800 100 442.

GIB® Installation Checklist

Site Address	Builder	
	Fixer	
	Stopper	
	Painter	

Before ANY board is fixed to the framing...	Y/N	Checked by	Date
Has the framing surface been checked for flatness? i.e. no protruding noggs, lintels etc?			
Is the moisture content acceptable i.e. Between 12 and 16%			
Are grooved jambs set up correctly to allow 1-1.5mm clearance for sheet edge?			
Are all ceiling battens running in same direction within room spaces?			
Are there any factors that could affect the fixing of the board? Please note here			
Substrate accepted by fixer			
NAME		SIGNED	DATE

Before ANY stopping commences...	Y/N	Checked by	Date
Have the number of joints been kept to a minimum?			
Has the lineal meterage of joints been kept to a minimum?			
Has the board been fixed horizontally wherever practical?			
Fastenings (nails or screws) have not been overdriven?			
No joints above or below the edges of windows or doors?			
No fastenings to sheet centres on walls? (Not applicable to FRR system)			
Butt joints in ceiling back-blocked where required?			
Correct size and spacing of glue daubs? (If viewed during installation)			
Are there any factors that could affect the stopping of the board? Please note here			
Substrate accepted by stopper			
NAME		SIGNED	DATE

Before ANY painting commences...	Y/N	Checked by	Date
Only paper tape used on stopping joints? No fibre mesh tape to be used.			
Surface free of visible trowel marks or defects.			
Are there any factors that could affect the painting of the board? Please note here			
Substrate accepted by painter			
NAME		SIGNED	DATE

Some or all of the following tools will be required depending on the actual work being carried out.

- Pencil
- Tape
- 1800 mm Straight Edge
- Drywall/Craft Knife
- Hammer
- Keyhole Saw
- Nail Punch
- Flat Crowbar, for lifting sheets 10 mm from floor when fixing
- Electric Drywall Screwgun or Cordless Drill with Clutch
- Adhesive Gun
- Plane, for planing framing smooth
- Saw

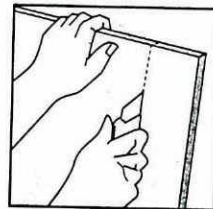
Fixing GIB® plasterboard using screws and glue is the best practise method. It is, however, important that screws are not overdriven and as such an electric drywall screwgun is the best tool to use. If this is not available an electric drill with a clutch can be used.

Tip: If using a cordless drill with clutch for fixing, take some time to adjust the clutch so that the screws do not cut through the surface of the paper. Practise on some off-cuts and timber or in an area that will be out of normal view. Remember that old timber will be much harder than newly installed timber, so be careful when working in areas with both.

Cutting & Attaching GIB® plasterboard

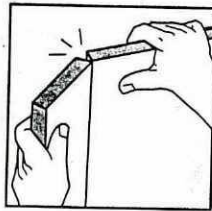
Cutting GIB® plasterboard sheets

1. Place the sheet with the face paper side up. Measure and mark the sheet to the size desired.
2. Line a straightedge up with the marks and hold firmly against the sheet. Draw a pencil line as a guide for scoring. Score through paper and lightly into the core using a drywall or craft knife.

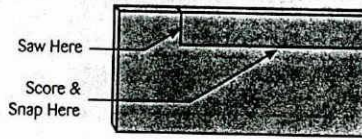


Extreme care should be taken when using sharp tools such as these.

3. To break the sheet core, securely grasp the board edges on both sides of the score line and snap the board with a quick firm movement. Alternatively, break the sheet over the end of the working surface or a length of timber.



4. Complete the cut by running the knife through the back paper of the sheet and snapping back to the face.



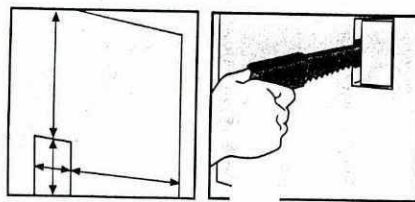
5. For sheets that require stepped areas it will be necessary to cut the short cuts with a saw prior to snapping the board.

Cut Outs

For openings such as an electrical outlet or switch box use the following method.

DO NOT use a hammer to create the hole.

1. Measure from where the side of the sheet will be located to the near and far sides of the installed box.
2. Measure from the top or bottom edge of where the sheet will be located to the top and bottom of the box.
3. Trace the outline of the electrical box at the appropriate position on the sheet.
4. Cut with a keyhole saw.



Tip: To get the saw started drill holes at each of the corners but within the opening. In some cases the saw can simply be pushed through the sheet without the need for holes.

Attaching GIB® plasterboard sheets

The best practice for fixing GIB® plasterboard involves the use of screws and glue. For walls glue is used to fix the areas in the centre of the sheet that come into contact with a stud or dwang/nog while screws are used around the perimeter of the sheet. For ceilings the same process is used, however, additional screws are required down the centre of the sheet.

GIB® Nails can also be used in place of screws. These-nails are specially designed for use with GIB® plasterboard. The nailing of ceilings is not recommended due to the 'springiness' in some timber ceiling battens.

Tip: Do not fix nails or screws through or closer than 200 mm to adhesive as this can cause the nails or screws to 'pop' as the glue dries and shrinks.

Gluing

GIBFix® All Bond can be used for attaching GIB® plasterboard to all surfaces. Alternatively, GIBFix® Wood Bond may be used for adhesion to timber framing and battens (not suitable for LOSP treated timber).

1. Make sure that the framing is clean and free from oil or dirt.
2. Apply adhesive using a gun at the appropriate spacing. A glue daub approximately the diameter of the framing timber should be used (see page 30).
3. Fix the sheet immediately after applying the glue to avoid the glue from 'skinning', resulting in poor adhesion.

Screwing

1. Hold the sheet tight against the framing.
2. Sink screws to just below the sheet surface, leaving the paper intact.

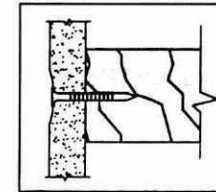
Tip: Use an electric drywall screwgun equipped with an adjustable depth control head and Philips bit. If a screw is overdriven and the paper and/or core of the GIB® plasterboard is damaged, insert a second screw approximately 50 mm from the first and then remove the first screw. Do not screw within 200 mm of any glue daubs as this can lead to problems such as 'popping'.

Nailing

Although screws are the preferred method of fixing plasterboard, GIB® Nails can be used for fixing to timber wall framing.

Tip: Galvanised clouts lack holding power and are not recommended.

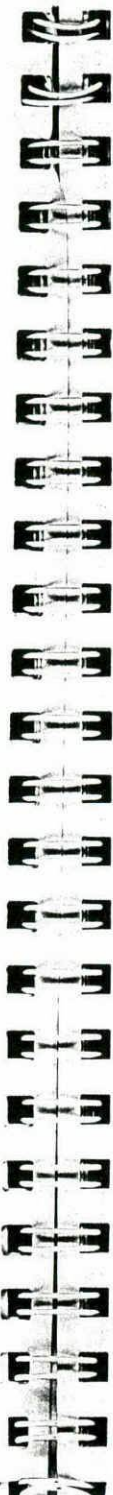
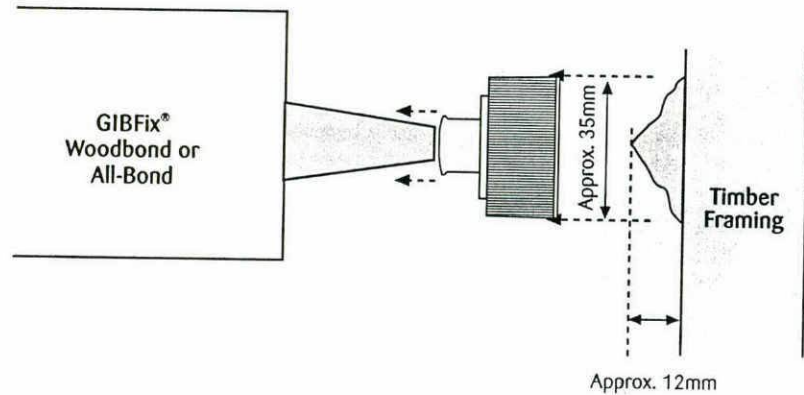
1. Drive the nail into the GIB® plasterboard so that a shallow dimple is formed by the last blow of the hammer.
2. Drive nails in straight, not on an angle. Do not overdrive or countersink nails as this results in breaking of the face paper and fracturing of the GIB® plasterboard core.



Tip: If damage does occur, drive a second nail approximately 50 mm from the first. Then drive the first nail until it is just below the surface of the board using a nail punch. Do not nail within 200 mm of any glue daubs as this can lead to problems such as 'popping'. Remove any loose or damaged plaster prior to stopping.

Tip - How much glue to use?

Applying any adhesive can be a messy and in some cases wasteful process. A simple method of reducing waste and having consistently sized daubs of adhesive is to remove the sealer cap from a sipper type drink bottle top and fit it to the nozzle of an adhesive cartridge. Press the face of the cap against the surface and apply pressure to the adhesive applicator gun. The cap will fill with adhesive and when full, pull the cap away from the surface. This will leave a daub of adhesive approximately 35mm in diameter and with a raised "peak" of about 10-12mm. The larger surface area on the end of the nozzle prevents adhesive "running" after application, thereby reducing waste and mess.



Walls – Timber Frame – Horizontal Fixing

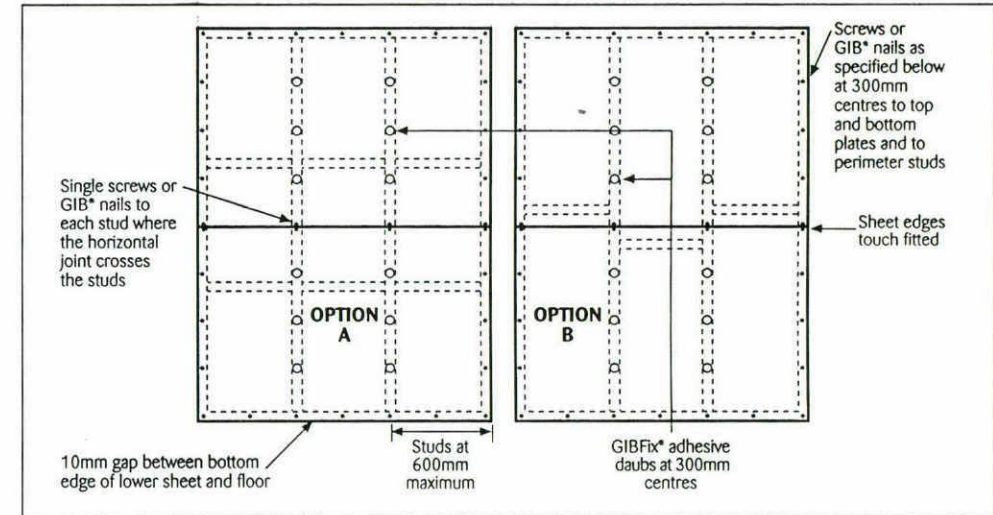
GIB® Standard plasterboard, GIB Ultralite®, GIB Toughline®, GIB Aqualine® and GIB Wideline®
If bracing, noise control, fire rating or tiling considerations exist consult the relevant section in this publication for appropriate information.

Wall Framing

Framing dimensions must comply with the requirements of NZS 3604:1999.

- The moisture content of timber framing shall be between 12-16% at the time of lining.
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard.
- For wall heights up to 2700mm, use either two rows evenly spaced nogs or one row of nogs staggered max 150mm either side of the centre line. 1350 wide sheets (GIB Wideline®) are available for fixing horizontally where stud height is between 2400 and 2700mm.
- For wall heights up to 3600mm an additional row of nogs is required.

Fastening the Linings - Horizontal Fixing only



- | | |
|--------------------------|---|
| Fasteners | <ul style="list-style-type: none"> - 10mm GIB® plasterboard - 25mm x 6g GIB® Grabber High Thread Drywall screws or 30mm x 2.8mm GIB® nails. - 13mm GIB® plasterboard 32mm x 6g GIB® Grabber High Thread Drywall screws or 30mm x 2.8mm GIB® nails. |
| Fasteners Centres | <ul style="list-style-type: none"> - 300mm centres to top and bottom plates and to perimeter studs. - Single screws or GIB® nails to each stud where the horizontal joint crosses the studs. - Place fasteners 12mm from sheet edges. - Daubs of GIBFix® adhesive at 300mm centres to intermediate studs. - Do not place adhesive at sheet edges or under fasteners. This may lead to screw or nail pops. |
| Lining | <ul style="list-style-type: none"> - Lay the sheets horizontally leaving a 10mm gap at the floor line to allow for movement of the framing members. - Sheets to be touch fitted. Use taper edge/square edge board wherever possible as this makes it easier for subsequent trades. |
| Jointing | <ul style="list-style-type: none"> - Jointing shall be carried out in accordance with the instructions on page 87 of this publication. |

Walls – Timber Frame – Vertical Fixing

GIB® Standard plasterboard, GIB Ultralite®, GIB Aqualine® and GIB Toughline®

If bracing, noise control, fire rating or tiling considerations exist consult the relevant section in this publication for appropriate information.

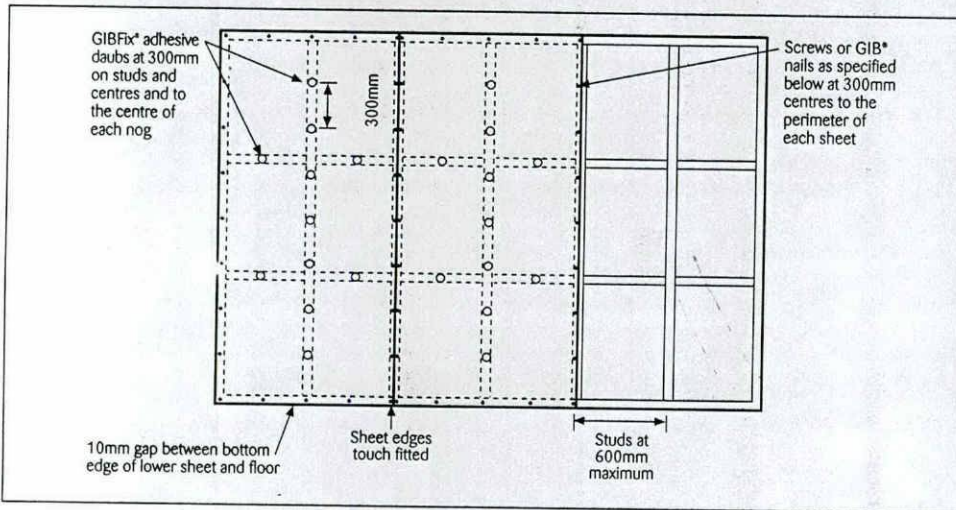
Wall Framing

Framing dimensions must comply with the requirements of NZS 3604:1999.

- The moisture content of timber framing shall be between 12-16% at the time of lining.
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard.
- Nogs are to be set at 800mm centres for 2400mm high walls, 900mm for 2700mm walls.

Fastening the Linings - Vertical Fixing

This framing layout is acceptable for horizontal fixing.



- | | |
|-------------------|--|
| Fasteners | <ul style="list-style-type: none"> - 10mm GIB® plasterboard - 25mm x 6g GIB® Grabber High Thread Drywall screws or 30mm x 2.8mm GIB® nails. - 13mm GIB® plasterboard 32mm x 6g GIB® Grabber High Thread Drywall screws or 30mm x 2.8mm GIB® nails. |
| Fasteners Centres | <ul style="list-style-type: none"> - 300mm centres around the sheet perimeter. - Place fasteners 12mm from sheet edges. - Daubs of GIBFix® adhesive at 300mm centres to intermediate studs and to the centre of each nog. - Do not place adhesive at sheet edges or under fasteners, this may lead to screw or nail pops. |
| Lining | <ul style="list-style-type: none"> - Lay the sheets vertically leaving a 10mm gap at the floor line to allow for movement of the framing members. - Sheets to be touch fitted. |
| Jointing | <ul style="list-style-type: none"> - Jointing shall be carried out in accordance with the instructions on page 87 of this publication. |

Walls – Steel Framing – Horizontal Fixing

Steel framing for residential construction is by specific design. The minimum lining for horizontal fixing on steel framing is 13mm GIB® plasterboard.

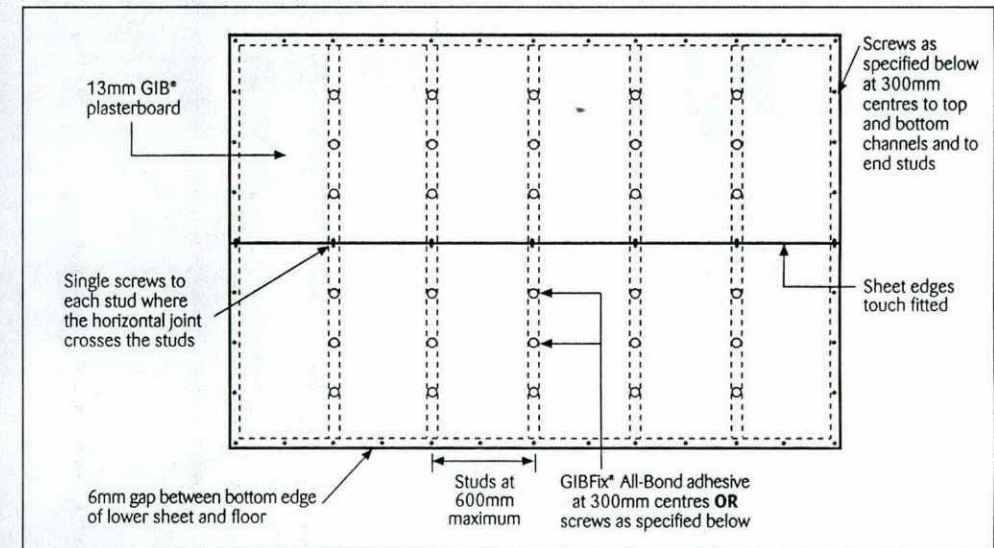
GIB® Standard plasterboard, GIB Ultralite®, GIB Toughline®, GIB Aqualine® and GIB Wideline®

If bracing, noise control, fire rating or tiling considerations exist consult the relevant section in this publication for appropriate information.

Wall Framing

- Steel stud dimensions to be minimum 63 x 34 x 0.55mm nominal with a 6mm return.
- Steel channel dimensions to be 63 x 30 x 0.55mm nominal.
- Studs shall be spaced at 600mm centres maximum.
- Ensure that the studs are placed with the open side facing in the same direction (see diagram page 35).

Fastening and Jointing the Linings - Horizontal Fixing



- | | |
|-------------------|---|
| Fasteners | <ul style="list-style-type: none"> - 25mm x 6g GIB® Grabber Self Tapping screws. |
| Fasteners Centres | <ul style="list-style-type: none"> - 300mm centres to top and bottom channels and to end studs. - Single screws to each stud where the horizontal joint crosses the studs. - Place fasteners 12mm from sheet edges. - Daubs of GIBFix® All-Bond adhesive OR screws at 300mm centres to intermediate studs. - Do not place adhesive at sheet edges or under fasteners. This may lead to screw or nail pops. |
| Lining | <ul style="list-style-type: none"> - Lay the sheets horizontally leaving a 6mm gap at the floor line. - Sheets to be touch fitted. Use taper edge/square edge board wherever possible as this makes it easier for subsequent trades. |
| Jointing | <ul style="list-style-type: none"> - Jointing shall be carried out in accordance with the instructions on page 87 of this publication. |

Grooved Jambs and Architraves

GIB® recommends...

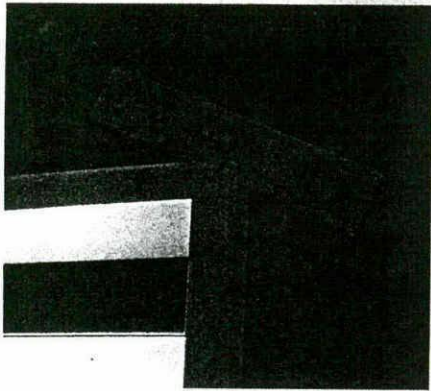
- The use of architraves for finishing around doors and windows for the following reasons.
 - Larger plasterboard sheets can be used, resulting in fewer joints.
 - Generally quicker to install plasterboard.
 - Reduced chance of remedial work due to better placement of joints
- If the use of grooved jambs is unavoidable here is some information to help minimise plasterboard fixing problems.

Architraves make best practice fixing of plasterboard much simpler. Grooved door jambs and window liners are an integral part of the New Zealand building scene. Unfortunately their use means that additional joints often need to be made in the wall surface. Installation of grooved jambs is subject to workmanship skills. Unless the jambs are correctly set up and installed, with a 1-2mm clearance for the plasterboard it is difficult to install the board effectively.

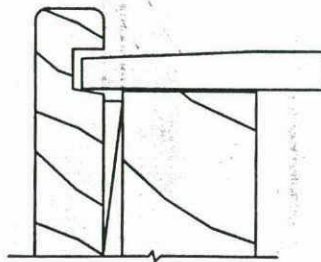
If the use of grooved jambs is unavoidable there are some golden rules to be followed.

The groove must be at least 1-2mm wider than the board that is being used. Trying to get a 10mm board into a 10mm groove will be difficult.

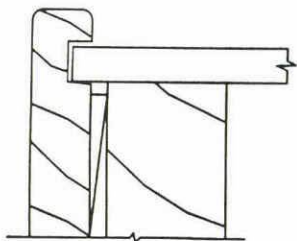
The back of the groove must line up with the face of the substrate.



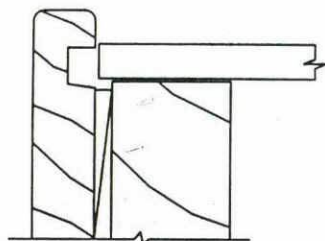
Correct installation of grooved jambs using an 11-12mm packer.



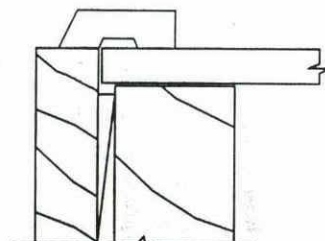
DO NOT place the tapered edge of a sheet into the groove. This requires unnecessary additional stopping. POOR PRACTICE!



Correct



Incorrect



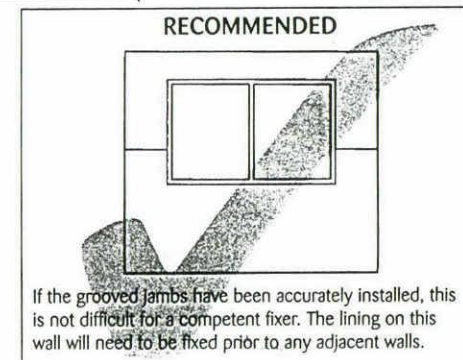
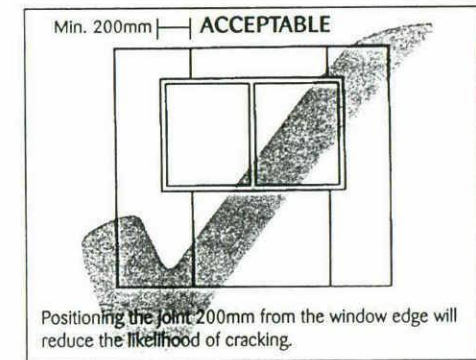
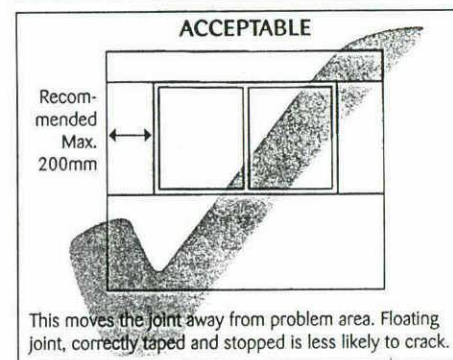
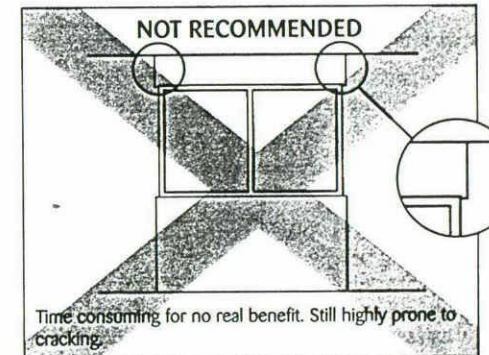
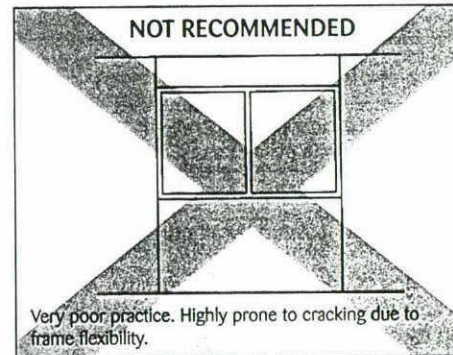
Recommended option using architrave



Summary

- Grooved jambs are designed to be quick and easy to install. Unless they are installed correctly, they can cause delays in plasterboard fixing and remedial work due to poorly positioned joints.
- Unless a small amount of time and effort is invested in getting the unit set up correctly, grooved jambs and liners can cause far more problems than they are worth.
- Simple best practice carpentry techniques are all that is required to install units accurately.
 - Accurate measuring and ordering by the building contractor.
 - Accurate fabrication by the joinery manufacturer.
 - Careful installation by the installer.
- Architraves are the preferred method of finishing round doors and windows.

Joint placement options round openings



Control Joints

Control joints

- Control joints relieve stresses imposed by structural movement including those due to excessive changes in temperature and humidity.

Walls

- In long unbroken partitions or wall runs, control joints are required at 9 metre centres. They are also required where structural control joints occur in the primary structure.
- Door frames extending from floor to ceiling constitute effective control joints.

Ceilings

- Extensive ceiling areas must have control joints spaced at 9 metre centres in both directions or 12 metre centres with perimeter relief (eg a negative detail to the perimeter of the ceiling lining).
- Joints may be positioned to intersect lighting fixtures, heating vents or air diffusers.

Joint Position	Maximum Centres
Walls	9 metres
Ceilings	9 metres (without perimeter relief) 12 metres (with perimeter relief)

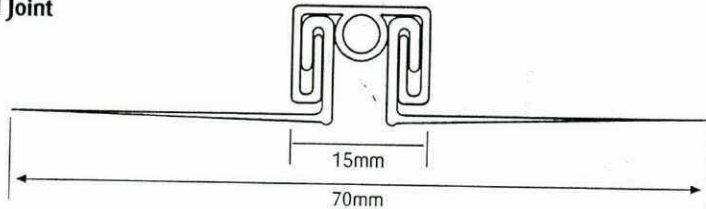
Other situations

- Where GIB® plasterboard meets dissimilar materials, it must be isolated by an edge trim or casing bead.
- In stair wells and high timber framed walls (often occurring in contemporary domestic construction) provision can be made for timber movement by leaving a 20mm gap between the sheet lining at or near the upper floor joists. This gap can be covered by a suitable cover batten.

Installation of the Rondo P35 control joint

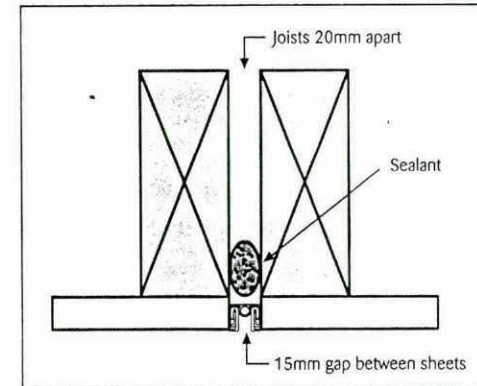
- Allow a 15mm gap between the plasterboard sheets.
- Locate the Rondo P35 control joint centrally in the gap. Staple both flanges to the lining at 150mm centres maximum.
- Finish with jointing material using the channel nibs as screeding guides.
- When the joint is dry remove the protective filament tape.

P35 Control Joint

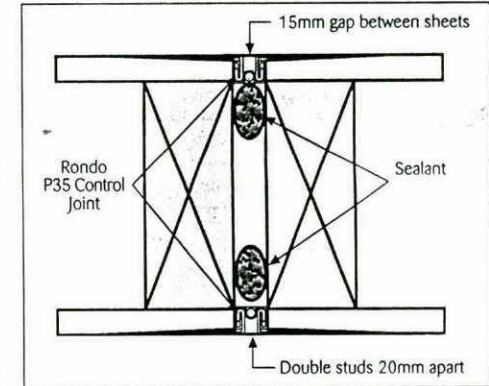


Typical Control Joint Details

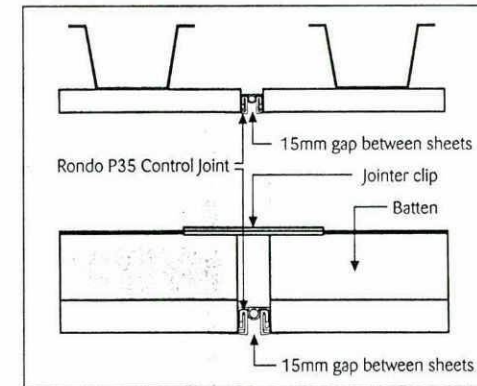
Timber Ceiling Joists



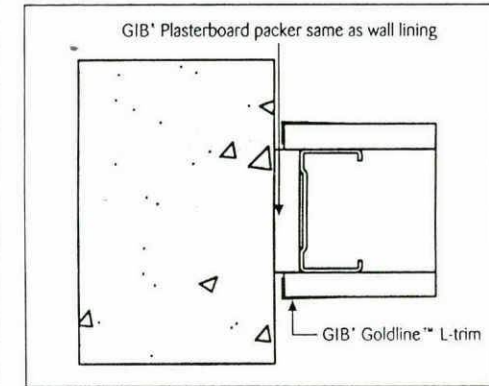
Timber Stud Walls



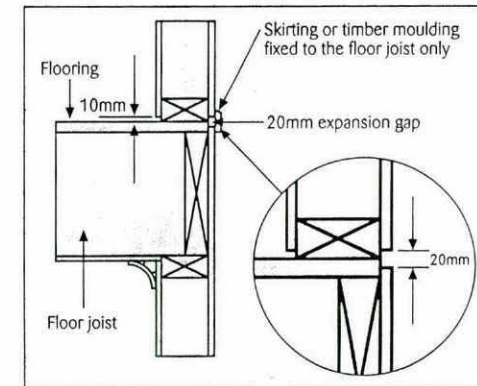
GIB® Rondo™ Steel Battens



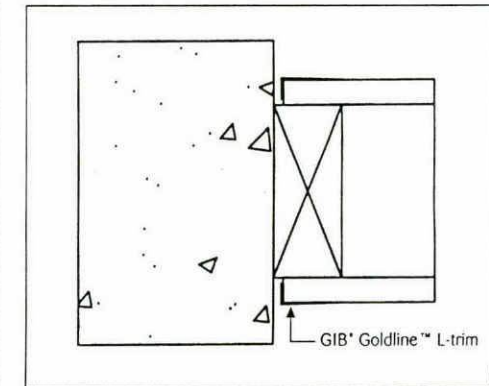
Masonry Junction Steel Frame



Two Storey Full Height Wall with Expansion Joint



Masonry Junction Timber Frame



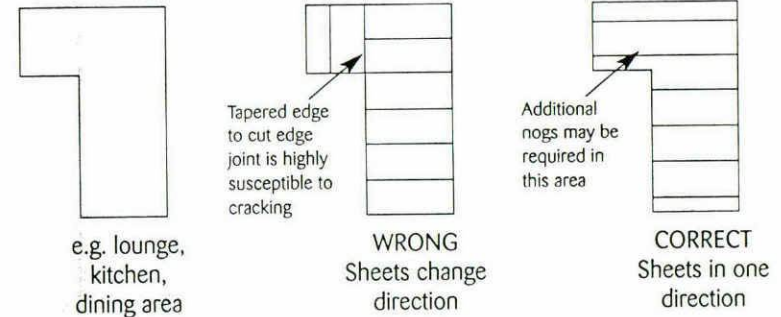
Note: Contact the GIB® Helpline for detailing of control joints in GIB® performance systems (e.g. fire, noise, bracing).

General Requirements

Framing dimensions must comply with the requirements of NZ 3604.

- The use of GIB® Rondo™ Steel Battens is recommended to achieve a stable substrate.
- Because of the heat that can be generated in roof spaces, timber battens can be subjected to conditions that can cause substantial movement resulting in joint failure and popped fastenings. If the use of timber battens is unavoidable additional care must be taken to ensure that moisture content of the timber battens is in the 12-16% range. This will lessen the risk of defects. Note also that finger jointed battens can have different moisture contents in each of the individual pieces of timber that make up the batten. This could result in different rates of shrinkage in a single batten. Timber batten spans, spacings and dimensions as per NZS 3604.
- Battens or ceiling joists shall be spaced as follows:-
 - 13mm GIB® plasterboard - 600mm centres maximum.
 - 10mm GIB® plasterboard - 450mm centres maximum.

All ceiling sheets must be fixed at right angles to the ceiling framing. Sheets must not be fixed in the same direction as the framing to which it is attached. All ceiling battens in a single area need to run in the same direction to enable this. Sometimes this will require additional nogs to be fitted between trusses. Failure to do this will result in a tapered edge/cut edge joint at a point that is highly susceptible to cracking.



GIB® recommends...

- 13mm GIB® plasterboard on steel battens at 600mm centres. When batten, labour and board costs are taken into account this system is the most cost effective as well as being the least prone to finishing defects.
- 13mm GIB Ultraline® has a smoother surface paper to give improved finish.

See page 39 for expansion joint details.

Radiant Ceiling Heating

Electric Radiant Ceiling Heating (ERCH) systems may give rise to abnormal localised or overall temperature conditions in ceiling spaces which could affect the timber framing and GIB® plasterboard linings. Excessive thermal or hygrometric movement induced by these systems may result in some or combinations of the following defects; deterioration of the gypsum in the GIB® plasterboard core (possibly affecting structural and fire resistant rating performance), fastener 'popping', joint peaking or joint cracking. Prior to construction, we suggest you contact your designer to fully consider these factors in order to optimise surface finish quality. Winstone Wallboards Ltd will not accept liability for surface finish quality problems where ERCH systems are installed in conjunction with any GIB® lining system.

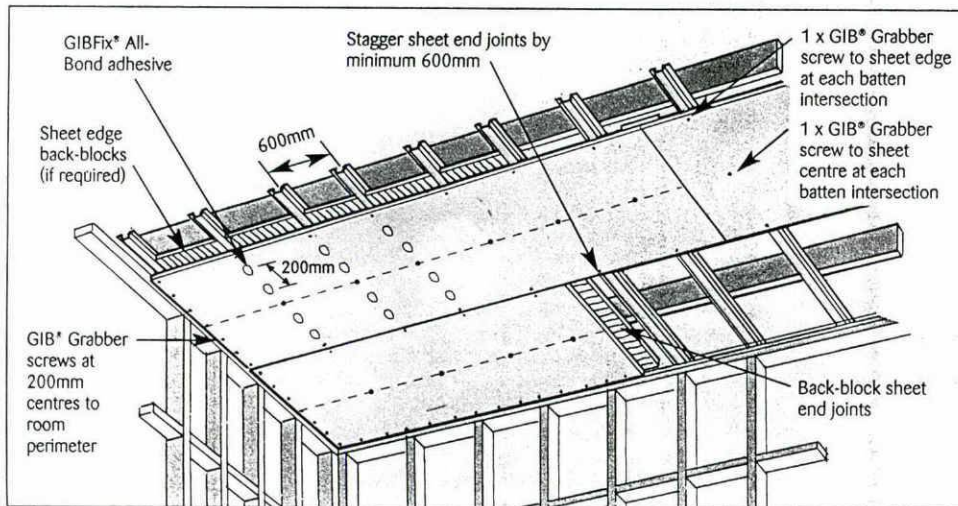
Standard Fixing Details

GIB® Standard plasterboard, GIB Ultralite®, GIB Aqualite® and GIB Toughline®

If bracing, noise control, fire rating considerations exist consult the relevant section in this publication for appropriate information.

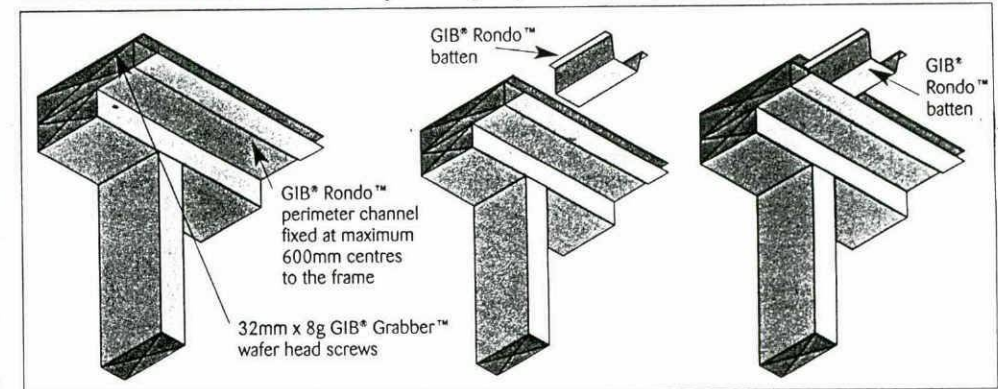
Fastening and Jointing the Ceiling Lining

- | | |
|-------------------|--|
| Fasteners | <ul style="list-style-type: none"> - Steel battens - 25mm x 6g GIB® Grabber Self Tapping screws. - Timber battens or Joists - 32mm x 6g GIB® Grabber High Thread screws. |
| Adhesives | <ul style="list-style-type: none"> - Steel battens - GIBFix® All Bond. - Timber battens - GIBFix® Wood Bond (not suitable for LOSP treated timber). |
| Fasteners Centres | <ul style="list-style-type: none"> - Single screws to the edges and centre of the sheets across each batten - Screws to be 12mm from sheet edges. - Daubs of adhesive at 200mm centres between the screws. - Sheets ends at wall junctions are fully screwed at 200mm centres. - Do not place adhesive at sheet edges or under fasteners, this may lead to screw or nail pops. |
| Lining | <ul style="list-style-type: none"> - The lining shall be fixed at right angles to the battens or joists. - Commence fixing from the centre of the sheets outwards. - Sheets to be touch fitted. - Use long length sheets to minimise sheet end butt joints. - Back-blocking of sheet end butt joints is recommended. - Back-blocking of sheet edge is required for level 4, 5 finishes (see page 7). |
| Batten Spacings | <ul style="list-style-type: none"> - 13mm GIB® plasterboard- 600mm centres max. - 10mm GIB® plasterboard - 450mm centres max. |

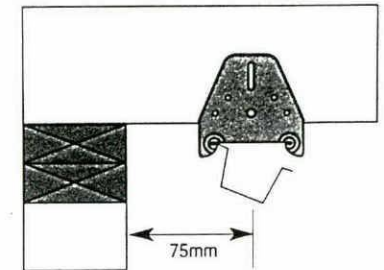
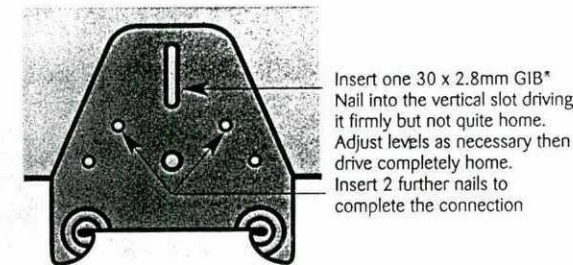
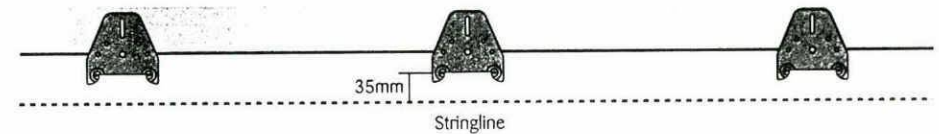


GIB® Rondo™ ceiling batten system installation instructions

Consult an electrical contractor for any earthing requirement that may need to be incorporated.

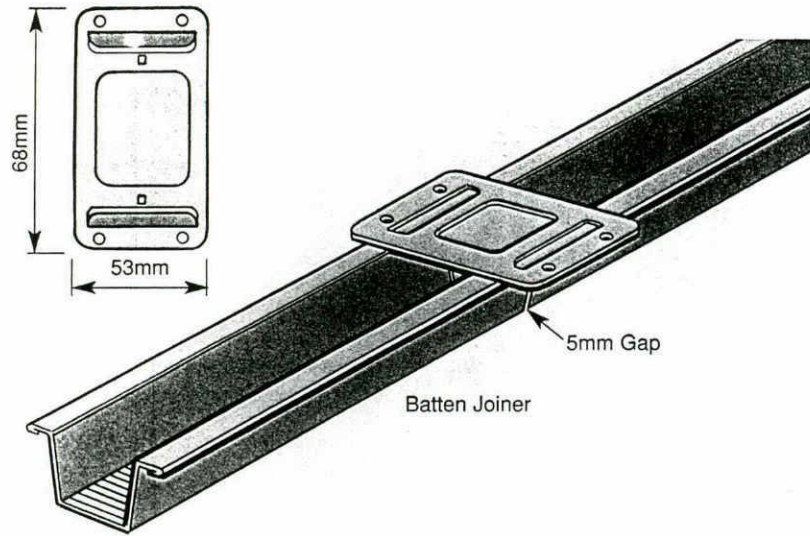


- Establish a datum line for the ceiling.
- Place a string line on the datum line at right angles to the battens, under the truss or joist closest to the centre of the room.
- Install clips at 600mm centres (450mm for 10mm board) using the string line to establish the correct position.
- Cut the batten to the required length using snips or a hacksaw.
- Insert the batten into the channel at each end and fit into the clip.
- Install remainder of clips ensuring that the batten is straight and flat.



Simply hook one side of the GIB® Rondo™ into the clip squeeze the batten sides together and push up into the clip. Release the batten and ensure it is locked into each side of the clip.

- If a joint needs to be made use a batten joiner clip. It is not recommended to make the joints as this can cause surface distortion.



Back-Blocking

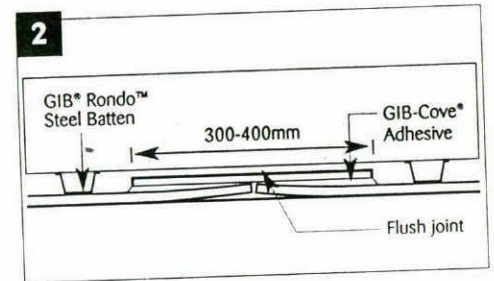
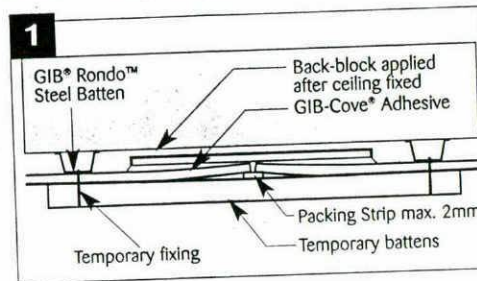
For general fixing, i.e. non fire rated systems, it is not recommended to fix sheet end butt joints on ceiling battens. Back blocking is the recommended option.

Back blocking is a practice that strengthens and stabilises joints between GIB® plasterboard sheets. It is primarily used to reinforce the joint and to artificially create a taper where butt joints occur. Back blocking consists of laminating strips of plasterboard to the back surface of the sheets directly behind joints using GIB-Cove® Adhesive. Panel adhesives are not suitable for back-blocking. Tapered edge joints can be back-blocked directly without the need for temporary battens and packing strips.

Sheet end joints

Where sheet end joints are unavoidable, they must be placed centrally between framing members (battens or joists) and back-blocked.

Back Blocking Butt Joints in Ceilings with Easy Access (post ceiling lining installation)



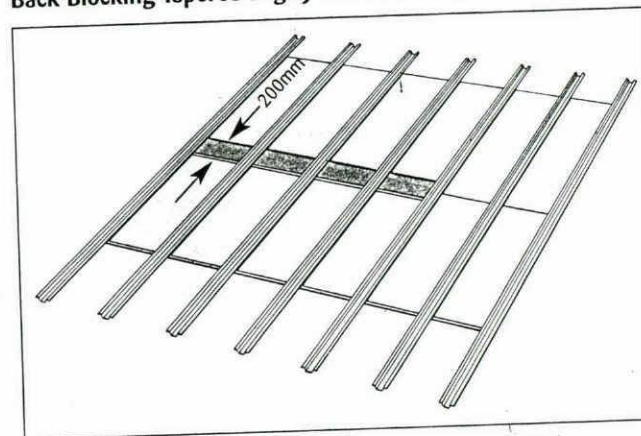
Tapered edge joints

To reduce the risk of cracks caused by substrate movement, GIB recommends back-blocking tapered edge joints in the following situations.

- When timber battens have been used: Any area containing 3 or more tapered joints. (Rooms 4.8m or wider)
- When steel battens have been used: Any area containing 6 or more tapered joints. (Rooms 8.4m or wider)

NB: When a level 5 finish has been specified for a ceiling ALL joints must be back-blocked.

Back Blocking Tapered Edge Joints in Ceilings (post lining installation)



GIB® Bracing Systems

Framing requirements

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604. Winstone Wallboards recommends the use of kiln-dried machine stress graded framing (KD MSG). To achieve the published bracing performance the minimum actual framing dimensions are 90 x 35mm for external walls and 70 x 35mm for internal walls. System BR always requires a minimum of 90 x 35mm framing.

Wall bracing tests on GIB® Systems were undertaken without nogs. Nogs are not considered to add to the bracing performance of the wall.

Fastening GIB® plasterboard linings

10mm and 13mm GIB® Standard plasterboard, 10mm and 13mm GIB® Ultraline and 13mm GIB Toughline® may all be fastened using 32mm x 6g GIB® Grabber drywall screws or 30 x 2.8mm GIB® Nails.

GIB Braceline®, 10mm GIB Noiseline® and 10mm GIB Toughline® must be fastened with 32mm GIB® Grabber™ Braceline screws, or 30mm GIB Braceline® nails.

GIB® linings for designated bracing elements are fastened at 150mm centres around the perimeter of the bracing element.

The first fastener is always placed 50mm away from the sheet corner. See details page 56.

Fastening in the field of the bracing element is conventional and the screw and glue method is recommended. (See Fastener Layout details, pages 54, 55).

When fixing part sheets of GIB® plasterboard, a minimum width of 300mm is recommended for bracing elements.

Full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs (or over the studs where horizontal fixing is permissible) and fastened at 200mm centres. Alternatively, the sheet end butt joints may be back-blocked.

Plywood (BR7) and Hardboard (BR8)

'Plywood' specified in BR7 is a grade C-D 7.5mm construction plywood manufactured to AS/NZS 2269:1994, fixed with 30 x 2.8mm GIB® Nails at 150mm centres around the perimeter of the bracing element and at 300mm centres to intermediate framing.

'Hardboard' specified in BR8 is 4.75mm standard or oil tempered hardboard manufactured by Fletcher Wood Panels Ltd., fixed with 30 x 2.8mm GIB® Nails at 150mm centres around the perimeter of the bracing element and at 300mm centres to intermediate framing.

Fire Resistance Ratings

GIB Braceline®, 10mm GIB Aqualine®, 10mm GIB Noiseline®, 10mm and 13mm GIB Ultraline® and 10mm GIB Toughline® may be substituted for 10mm GIB Fyrelite® in fire rated constructions.

The fastener length for the fire rated system applies. The field of the braced element must also be fastened in accordance with the fire rated specification (adhesive not permitted).

Jointing and Stopping

All sheet joints must be paper tape reinforced and stopped in accordance with instructions on page 87 of this publication.

Fastening the Bracing Element to Timber Floors

Fastening of the bottom plate of a GIB® wall bracing element to a timber framed floor must be in accordance with NZS3604 with pairs of 100 x 3.75mm nails at 600mm centres. In addition 6 or 12kN connections must be installed when specified for the particular bracing element type.

Fastening the Bracing Element to Concrete Slabs

Fastening of the bottom plate of a GIB® wall bracing element to concrete floors must be in accordance with NZS3604 for external walls, which includes a 12mm bolt (complete with a 50 x 50 x 3mm square washer) or a proprietary fixing with equivalent performance within 150mm (90mm for BR6) from both ends of the wall bracing elements.

On internal bracing lines, the bottom plate of GIB® Bracing elements may be fixed using 3.8mm shot fired fasteners fitted with 16mm discs, spaced at 150mm and 300mm from the end studs and thereafter at 600mm centres. This method only applies to Systems GIB1, 2, 3, 10, 11 and BR1, 2, 3.

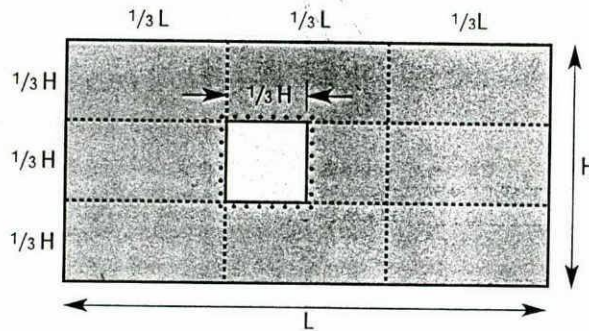
Hold-Down Strap Placement (Refer Illustrations page 57)

Where 6kN connections are specified in the 'Additional Requirements' column, they are required only if the bracing element terminates within 1.2 metres from a door or window opening (see illustration, page 58).

Where 12kN connections are specified they must be installed at both ends of the bracing element in all cases.

Openings in Bracing Elements

Openings are allowed within the middle third of a wall bracing element's length and height. Neither opening dimension shall be more than one third of the element height. Wall linings are fixed to opening trimmers at 150mm centres. Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element.



Steel Angle Braces

Angle braces serve to keep frames square during transport and construction. They also act as part of the temporary bracing of a building under construction. Angle braces contribute only a fraction to the bracing of a completed structure. The performance of a completed building depends mainly on the wall linings and their fixings.

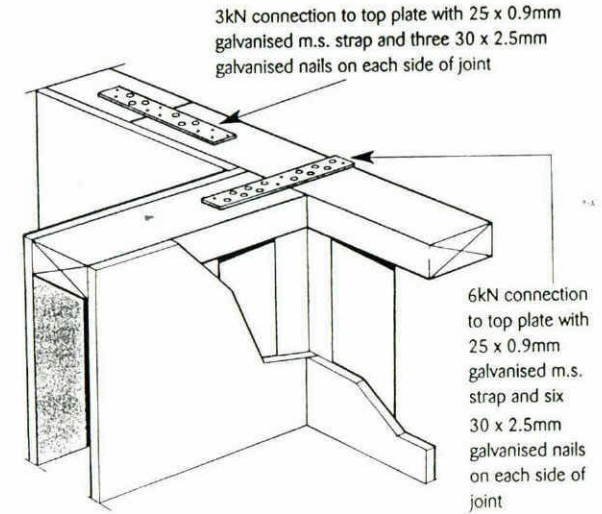
Where specified, metal angle braces must be placed at an angle no steeper than 55 degrees, and within the designated length of the bracing element. For elements longer than 3.6 metres, pairs of angle braces (in opposite directions) are required. Fixing of angle braces is with three 30 x 2.8mm GIB® nails to top and bottom plates, and two 30 x 2.8mm nails to intermediate framing.



Top Plate Connections

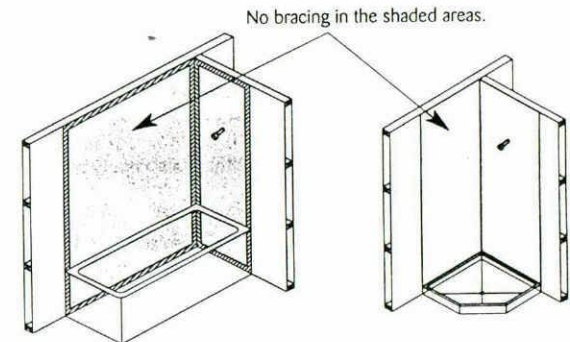
The top plate of a wall that contains one or more wall bracing elements shall be jointed according to the rating of the highest-rated individual wall bracing element as follows:

- Rating not exceeding 100 bracing units: A 3kN connection as shown or by an alternative fixing of 3kN capacity in tension or compression along the plate;
- Rating exceeding 100 bracing units: A 6kN connection as shown or by an alternative fixing of 6kN capacity tension or compression along the plate.



Bracing in Bathrooms

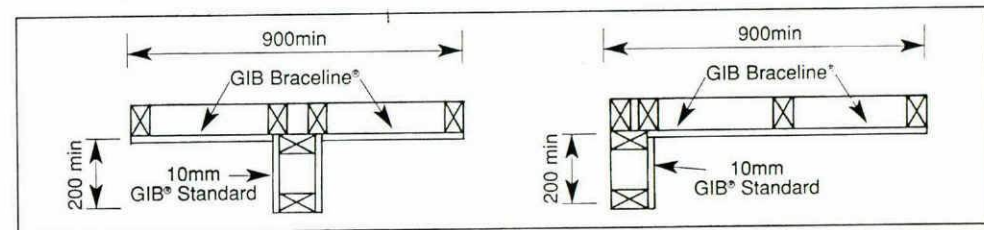
GIB® Bracing Systems must not be installed in shower cubicle or in a shower over bath situation.



Intersecting Wall Details (all GIB® Bracing Sheet Types)

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Bracing element sheets shall be fixed and jointed as given on pages 54, 55 and 87. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions (illustrated below) shall be fixed and jointed as specified for intermediate sheet joints.

The bracing element length must be no less than 900mm.



Where Wall Bracing Elements are interrupted by T or L junctions (as illustrated in the 900mm example above) they should be considered as follows: The bracing element has been cut to accommodate the junction. Nevertheless, in respect of calculating Bracing Units, the Bracing Element is deemed to be continuous for the whole length (900mm in this particular case).

GIB Bracing Tables

TABLE 1:
Bracing Unit ratings for 10mm and 13mm GIB® Standard plasterboard, 10mm and 13mm GIB Ultraline®, 10mm GIB Aqualine®, 10mm GIB Fyrelle®.

Type	Minimum length (m)	Lining Requirement	Additional Requirement	Bracing Units per metre (wind)	Bracing Units per metre (Earthquake)
10mm GIB® Standard plasterboard bracing systems (these ratings also apply to 10mm GIB Aqualine®, and 10mm GIB Fyrelle®)					
GIB1a	1.8 and less than 2.4	10mm GIB® Standard one face, fixed horizontal or vertical	diagonal brace	55	50
GIB1b	2.4 and greater			75	50
GIB2a	1.8 and less than 2.4	10mm GIB® Standard both faces, fixed horizontal or vertical	diagonal brace	75	60
GIB2b	2.4 and greater			80	70
GIB3	1.2	10mm GIB® Standard both faces, fixed horizontal or vertical	N/A	65	60
13mm GIB® Standard plasterboard bracing systems (these ratings also apply to 13mm GIB Ultraline®)					
GIB10	1.8	13mm GIB® Standard one face, fixed horizontal or vertical	N/A	65	60
GIB11	1.2	13mm GIB® Standard both faces, fixed horizontal or vertical	N/A	65	65
10mm and 13mm GIB Ultraline® bracing systems					
UL1	1.2	GIB Ultraline® one face, fixed horizontal or vertical	6kN connections	70	60
UL2	1.2	GIB Ultraline® both faces, fixed horizontal or vertical	6kN connections	100	85

Note: GIB® Bracing Systems must not be used in showers or shower over bath situations.

TABLE 2: Bracing Unit ratings for 10mm GIB Braceline®, GIB Toughline® and GIB Noiseline®

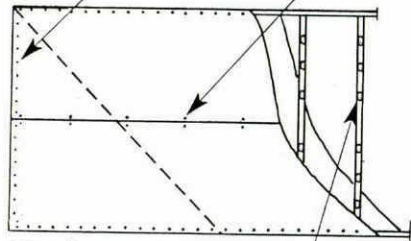
Type	Minimum length (m)	Lining Requirement	Additional Requirement	Bracing Units per metre (wind)	Bracing Units per metre (Earthquake)
10mm GIB Braceline® bracing systems (these ratings also apply to GIB Toughline® and GIB Noiseline®)					
BR1a	1.8 and less than 2.4	GIB Braceline® one face, fixed horizontal or vertical	diagonal brace	70	60
BR1b	2.4 and greater			90	75
BR2a	1.8 and less than 2.4	GIB Braceline® one face, fixed vertical	N/A	75	60
BR2b	2.4 and greater			85	60
BR3a	1.8 and less than 2.4	GIB Braceline® one face, fixed horizontal	N/A	60	45
BR3b	2.4 and greater			95	65
BR4	0.9 and less than 1.2	GIB Braceline® one face, fixed vertical or horizontal.	6kN connections	100	85
BR5	1.2	GIB Braceline® one face, fixed vertical or horizontal.	6kN connections	115	85
BR6	1.2	GIB Braceline® one face, 10mm GIB® Standard on the other, fixed vertical or horizontal.	12kN connections	150	110
BR7	0.9	GIB Braceline® one face, 7.5mm plywood on the other, fixed vertical or horizontal.	6kN connections	145	145
BR8	0.9	GIB Braceline® one face, 4.75mm hardboard on the other, fixed vertical or horizontal.	6kN connections	120	95
BR9	0.6	GIB® Braceline one face, fixed vertical or horizontal.	6kN connections	110	95

- Notes:**
- Where linings are specified on both faces (Systems GIB2, GIB3, GIB11, UL2, BR6, BR7, BR8) each face must be fastened as a braced element. Refer page 49 for fastening systems relating to Plywood and Hardboard. The 10mm GIB® Standard on the reverse face of BR6 is fastened as per system GIB1.
 - See notes on Hold-Down Strap Placement, page 57.



32mm x 6g GIB® Grabber™ screws or 30mm GIB® Nails at 150mm centres to perimeter of Bracing Element

Single 32mm screws or GIB® Nails where sheets cross studs

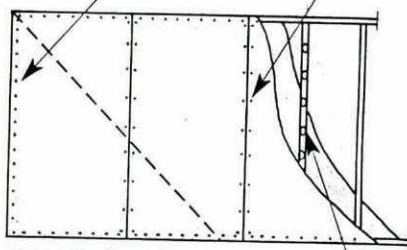


GIB® 1 (lined one side)
GIB® 2 (lined both sides)
(Horizontal Fixing)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

32mm x 6g GIB® Grabber™ screws or 30mm GIB® Nails at 150mm centres to perimeter of Bracing Element

Single 32mm screws or GIB® Nails at 300mm centres

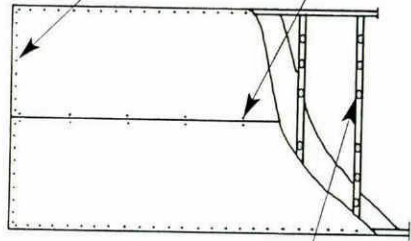


GIB® 1 (lined one side)
GIB® 2 (lined both sides)
(Vertical Fixing)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

32mm x 6g GIB® Grabber™ screws or 30mm GIB® Nails at 150mm centres to perimeter of Bracing Element

Single 32mm screws or GIB® Nails where sheets cross studs

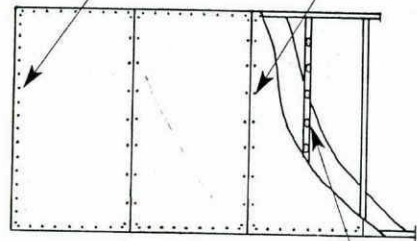


GIB® 3 (lined both sides)
GIB® 10 (lined one side)
GIB® 11 (lined both sides)
(Horizontal Fixing)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

32mm x 6g GIB® Grabber™ screws or 30mm GIB® Nails at 150mm centres to perimeter of Bracing Element

Single 32mm screws or GIB® Nails at 300mm centres

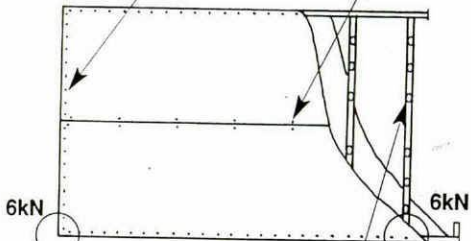


GIB® 3 (lined both sides)
GIB® 10 (lined one side)
GIB® 11 (lined both sides)
(Vertical Fixing)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

32mm x 6g GIB® Grabber™ screws or 30mm GIB® Nails at 150mm centres to perimeter of Bracing Element

Single 32mm screws or GIB® Nails where sheets cross studs

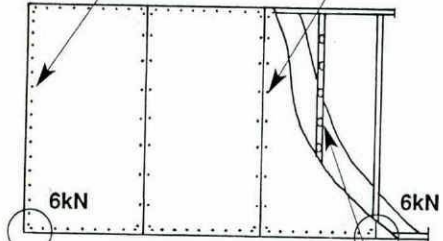


UL1 (lined one side)
UL2 (lined both sides)
(Horizontal Fixing)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

32mm x 6g GIB® Grabber™ screws or 30mm GIB® Nails at 150mm centres to perimeter of Bracing Element

Single 32mm screws or GIB® Nails at 300mm centres

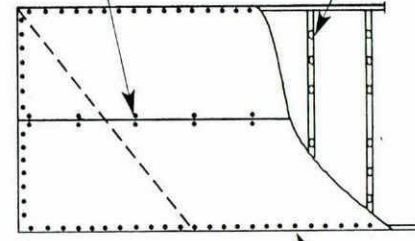


UL1 (lined one side)
UL2 (lined both sides)
(Vertical Fixing)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

Single 32mm screws or GIB® Nails where sheets cross studs

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

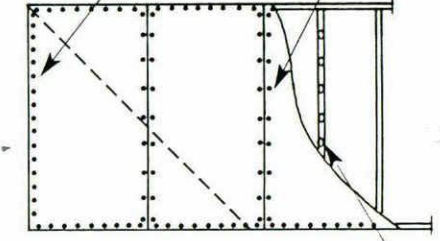


BR1 (lined one side)
(Horizontal Fixing)

32mm GIB Braceline® screws or 30mm GIB Braceline® clouts and washers at 150mm centres to perimeter of braced element

32mm GIB Braceline® screws or 30mm GIB Braceline® clouts and washers at 150mm centres to perimeter of braced element

Single 32mm screws or GIB® Nails at 300mm centres

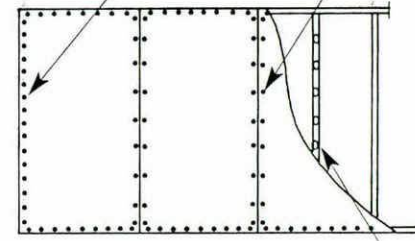


BR1 (lined one side)
(Vertical Fixing)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

32mm GIB Braceline® screws or 30mm GIB Braceline® clouts and washers at 150mm centres to perimeter of braced element

Single 32mm screws or GIB® Nails at 300mm centres

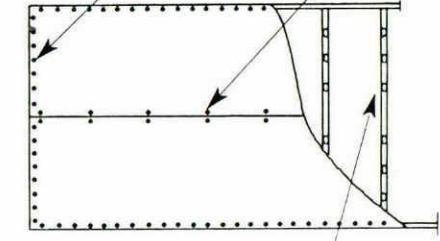


BR2 (lined one side)
(Vertical Fixing Only)

Daub of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

32mm GIB Braceline® screws or 30mm GIB Braceline® clouts and washers at 150mm centres to perimeter of braced element

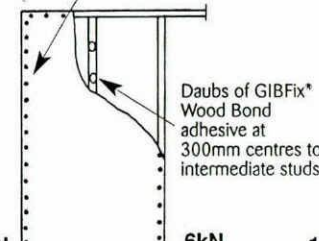
Single 32mm screws or GIB® Nails where sheets cross studs



BR3 (lined one side)
(Horizontal Fixing Only)

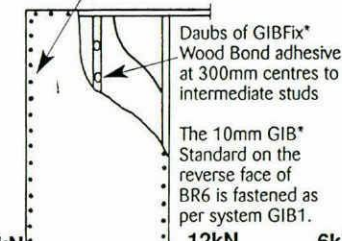
Daub of GIBFix® Wood Bond adhesive only at 300mm centres to intermediate studs

32mm GIB Braceline® screws or 30mm GIB Braceline® clouts and washers at 150mm centres to perimeter of braced element



BR4 (lined one side)
BR5 (lined one side)

32mm GIB Braceline® screws or 30mm GIB Braceline® clouts and washers at 150mm centres to perimeter of braced element

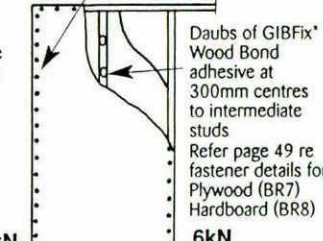


BR6 (lined both sides)

Daubs of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

The 10mm GIB® Standard on the reverse face of BR6 is fastened as per system GIB1.

32mm GIB Braceline® screws or 30mm GIB Braceline® clouts and washers at 150mm centres to perimeter of braced element

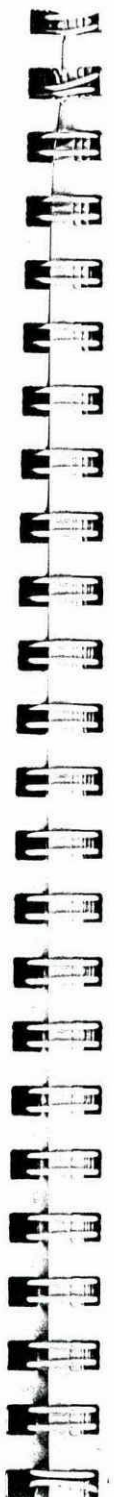
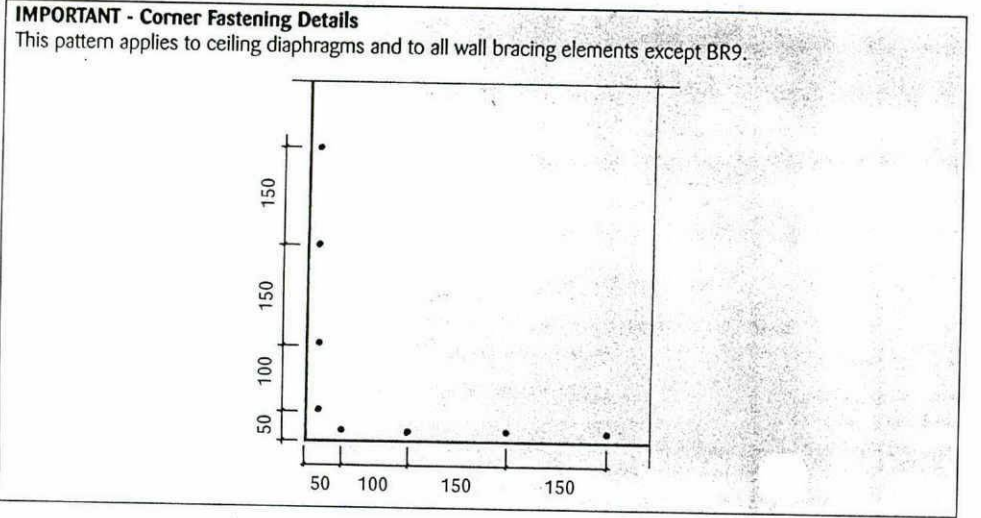
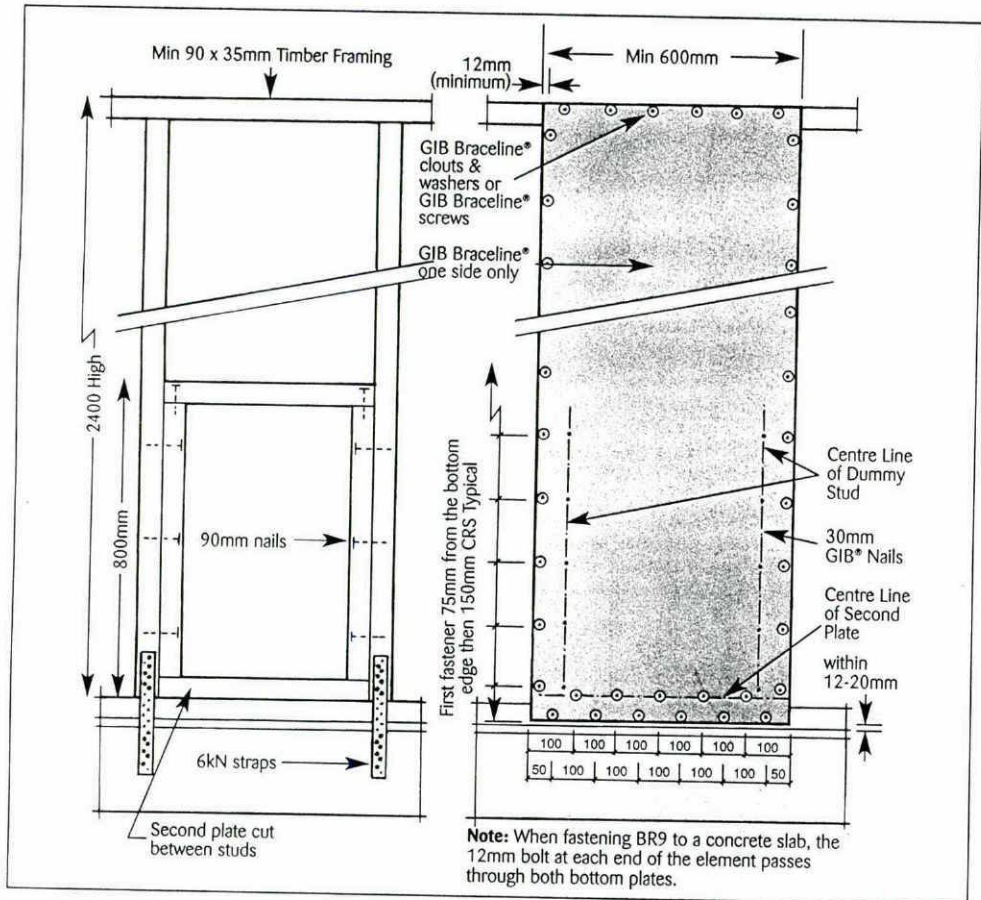


BR7 (lined both sides)
BR8 (lined both sides)

Daubs of GIBFix® Wood Bond adhesive at 300mm centres to intermediate studs

Refer page 49 re fastener details for Plywood (BR7) Hardboard (BR8)

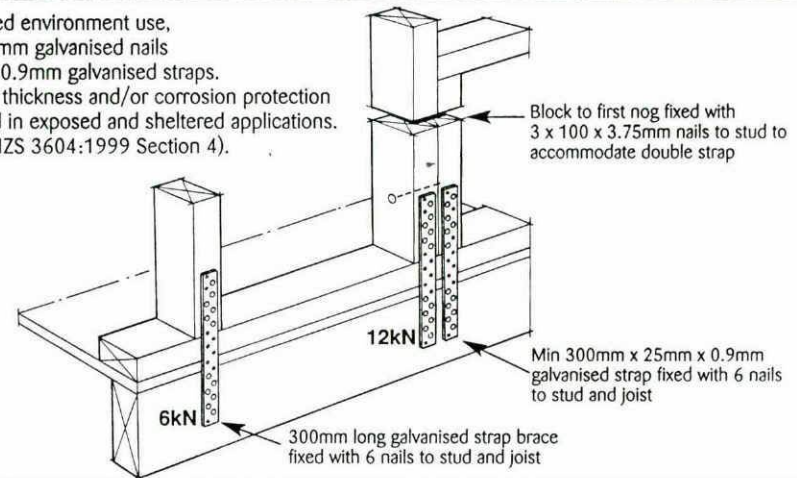
Note: If the length of the braced element using systems BR4, BR5, BR6, BR7 and BR8 exceeds 1.2m, then the sheet edges within the element are secured with single screws or nails at 300mm centres. Also these systems may be fixed horizontally as given above for BR3.



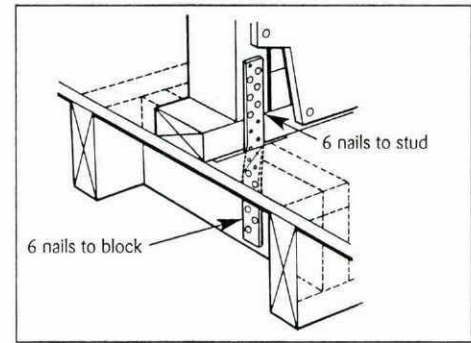
Hold-down Straps

Timber Floor – External Wall

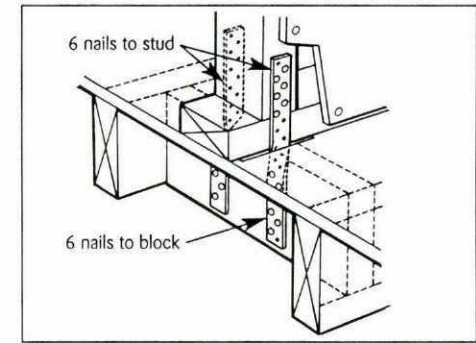
For a closed environment use,
 • 30 x 2.5mm galvanised nails
 • 25mm x 0.9mm galvanised straps.
 Additional thickness and/or corrosion protection is required in exposed and sheltered applications. (Consult NZS 3604:1999 Section 4).



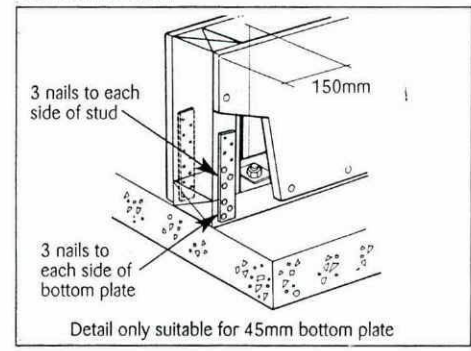
**Timber Floor – Internal Wall
6kN connection**



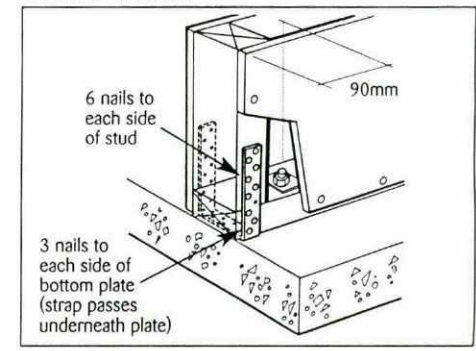
**Timber Floor – Internal Wall
12kN connection**



**Concrete Floor
6kN connection**

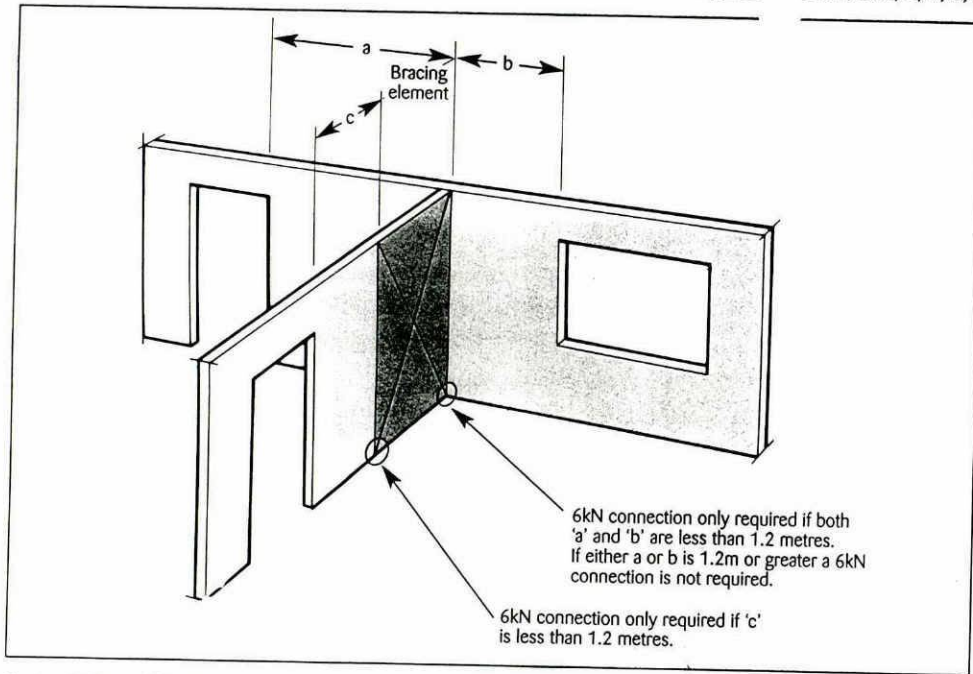


**Concrete Floor
12kN connection**



6kN Connections – UL1, U R4, BR5, BR7, BR8 & BR9
 12kN Connections – BR6

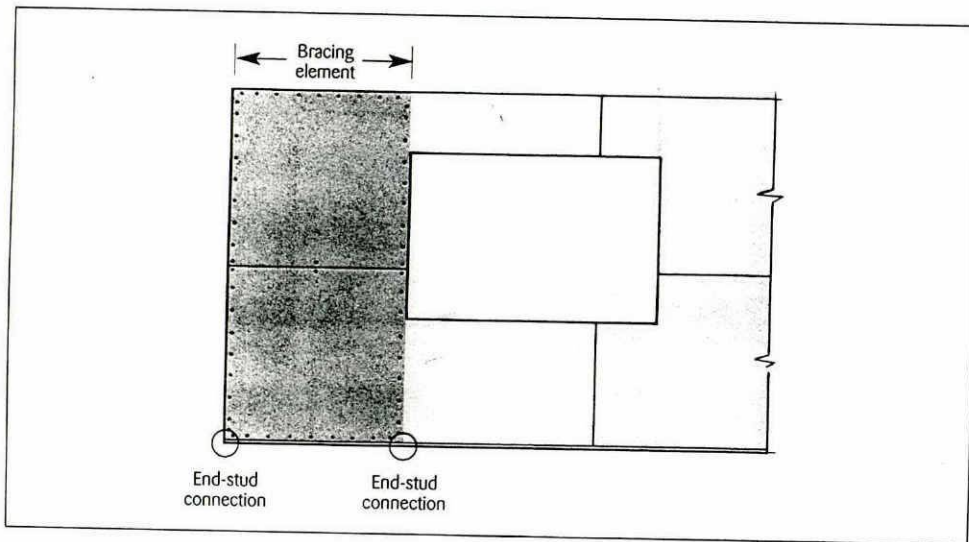
Applies L1, 2, BR4, 5, 7, 8, 9



Note: Where 12kN connections are specified (BR6) they must be installed at both ends of the bracing element in all cases.

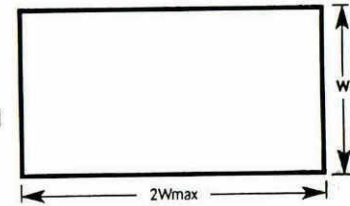
Horizontal Fixing (BR4, 5, 6, 7, 8, 9)

GIB Braceline® linings in systems BR4, 5, 6, 7, 8, 9 may be fixed horizontally when linings extend under/over door or window openings. GIB Braceline® fasteners are provided around the perimeter of the bracing element.



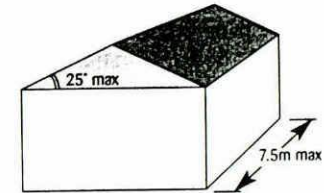
Ceiling Diaphragms

GIB® ceiling diaphragms are strong and stiff horizontal bracing elements which effectively transfer loads over large distances. They may be used to space bracing lines further apart than 5 metres (single top plate), or 6 metres (double top plate). A ceiling diaphragm may be square or rectangular. Its length shall not exceed twice its width. The width being measured horizontally between supporting walls. Ceiling diaphragms under light and heavy roofs are required to comply with NZS3604:1999.



Limitations for 10mm or 13mm GIB® Standard Ceiling Diaphragms

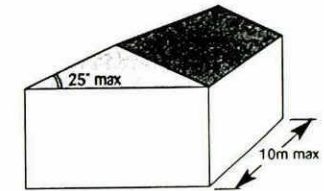
- Diaphragms not steeper than 25 degrees to the horizontal shall not exceed 7.5 metres in length.
- 10mm or 13mm GIB® Standard is fastened at 150mm centres to the boundary members around the entire perimeter of the diaphragm. Fasteners - 32mm x 6g GIB® Grabber™ drywall screws or 30mm x 2.8mm GIB® Nails.



GIB® Standard Diaphragms

Limitations for 10mm or 13mm GIB Ultraline® Ceiling Diaphragms

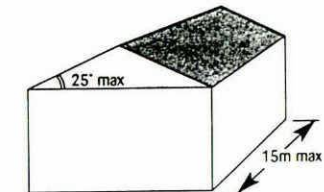
- Diaphragms not steeper than 25 degrees to the horizontal shall not exceed 10 metres in length.
- GIB Ultraline® is fastened at 150mm centres to the boundary members around the entire perimeter of the diaphragm. Fasteners - 32mm x 6g GIB® Grabber™ drywall screws or 30mm x 2.8mm GIB® Nails.



GIB Ultraline® Diaphragms

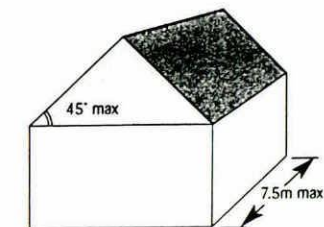
GIB Braceline® Ceiling Diaphragms

- Diaphragms not steeper than 25 degrees to the horizontal shall not exceed 15 metres in length.
- Diaphragms not steeper than 45 degrees to the horizontal shall not exceed 7.5 metres in length.
- GIB Braceline® is fastened at 150mm centres to the boundary members around the entire perimeter of the diaphragm. Fasteners - 32mm GIB® Grabber™ Braceline screws or 30mm GIB Braceline® nails and washers.



General Fixing Requirements for GIB® Ceiling Diaphragms

- Linings shall be installed over the entire area of the diaphragm.
- Fastening shall be no less than 12mm from sheet edges.
- Sheets shall be supported by framing members (e.g., ceiling battens) spaced at no more than 450mm centres for 10mm GIB® Standard, 10mm GIB Ultraline®, 10mm GIB Noiseline®, GIB Braceline® and at no more than 600mm centres for 13mm GIB® plasterboard and 13mm GIB® Ultraline.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with instructions on pages 44 and 87 of this publication. All joints shall be paper tape reinforced and stopped. It is recommended that sheet



GIB Braceline® Ceiling Diaphragms

- Full width sheets with a length not less than 1800mm shall be used at the ends of the diaphragm. In the middle third of the diaphragm the sheet width may be reduced.
- Openings are allowed within the middle third of the diaphragm's length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings, or openings in other locations, require specific engineering design.

Ceiling Diaphragms - Steel Battens

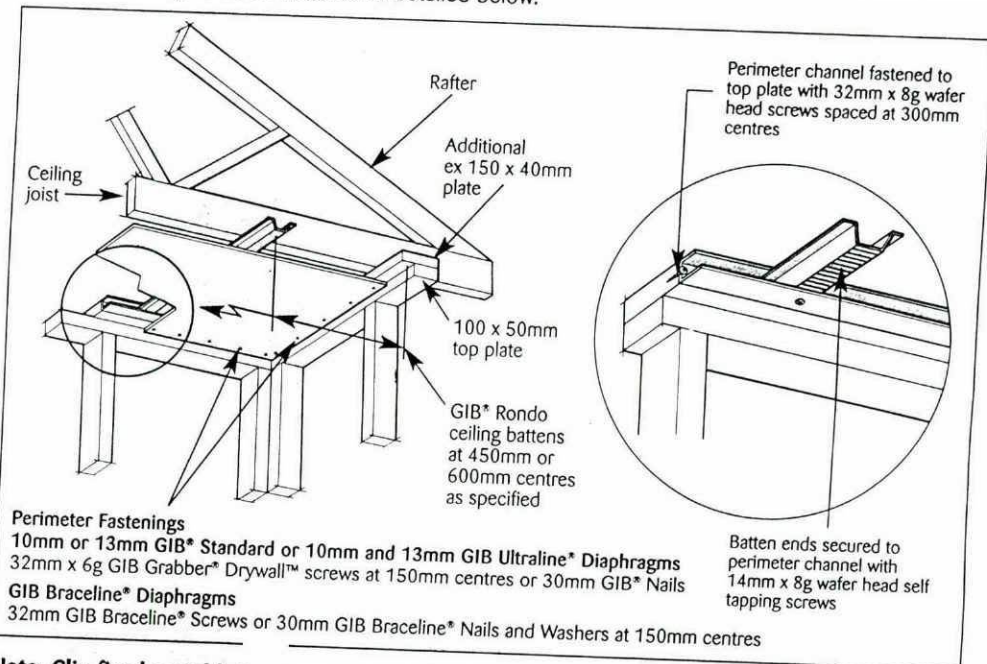
Steel Battens

The GIB® Rondo and USG DONN Screwfix (FC37 and FC50) battens may be used to construct GIB® Standard plasterboard, GIB Ultralite® and GIB Braceline® ceiling diaphragms.

- The battens must be directly fixed to the trusses or joists. Clip fixing is NOT suitable.
- The battens shall be spaced at 450mm centres maximum for 10mm GIB® Standard plasterboard, 10mm GIB Ultralite®, 10mm GIB Noiseline® and GIB Braceline® and at no more than 600mm centres for 13mm GIB® Standard plasterboard and 13mm GIB Ultralite®. The battens are fastened through both flanges directly to the ceiling framing with 32mm x 8g Wafer Head screws.
- A steel perimeter channel is required at the perimeter of the diaphragm. The channel shall be fastened to the top plate with 32mm x 8g Wafer Head screws spaced at 300mm centres maximum.
- The linings are fastened to the perimeter channel at 150mm centres maximum with 25mm x 6g self tapping screws.
- Within the diaphragm area, sheets may be fastened as described in "General Fixing Requirements for GIB® Ceiling diaphragms", page 59.

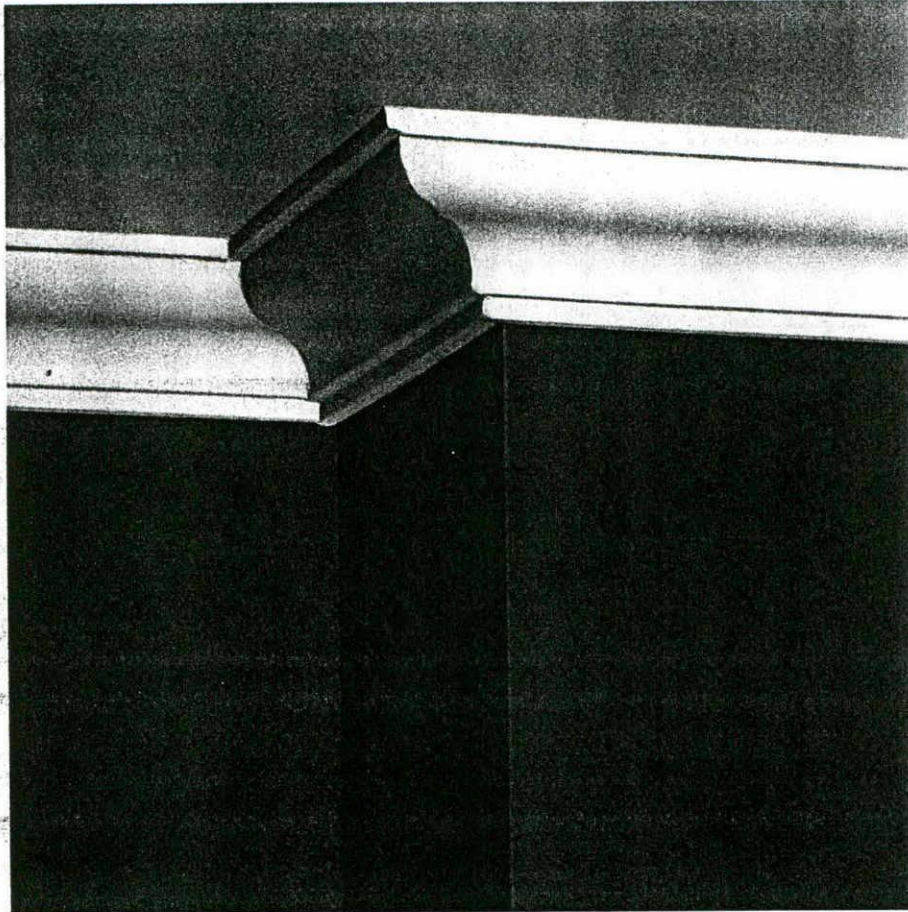
Alternative Double Top Plate Detail

- Alternatively, should an additional top plate (ex 150 x 40mm) be used, GIB® Rondo steel battens (35mm deep) shall be installed as detailed below.



Note: Clip fixed metal battens are not suitable for use in a ceiling diaphragm.

GIB-Cove[®]



- An attractive finish that is easily painted
- Quick and easy to fix
- Crack-resistant joints
- No gaps at wall/ceiling intersections
- A stable system that ties walls and ceilings together

GIB-Cove® is the ideal finishing system for wall and ceiling junctions

Installation Instructions

Tools and Materials

- Sponge
- Sand Paper
- Bowl or bucket
- Saw
- Paint Brush
- Broad knife
- Pencil
- Ruler
- Mitre Box
- GIB-Cove®
- GIB-Cove® Bond
- Water

Preparation

- Remove any dust or loose material from the GIB® Plasterboard.
- For direct bonding to masonry, the surface must be completely dry, free of efflorescence, dust, oil, paint or any other material that may impair the bonding of the adhesive.
- To ensure accurate placement, mark ceilings and walls with a chalk line to suit the size of the GIB-Cove®.

Joints and Mitres

- Measure and cut the GIB-Cove® using a fine tooth saw and mitre box, or Mitre Mate. It is best to cut all the GIB-Cove® before commencing.
- Where more than one length is required along a wall, the joints should also be mitred.
- Make all saw cuts towards the curve of the GIB-Cove® and smooth by lightly sanding.
- Cut the lengths of GIB-Cove® so that the tape on the reverse of the GIB-Cove® will be facing the same direction when affixed to the wall.

Fixing

- Fix GIB-Cove® using GIB-Cove® Bond.

Mixing Instructions for GIB-Cove® Bond

- Ensure that the mixing equipment and water are clean.
- Use 1.2 - 1.4 litres of water to 2 kg of powder (12 - 14 litres of water per 20 kg bag) of GIB-Cove® Bond.
- Place the water into a bowl and sprinkle the compound into the water.
- Mix into a creamy consistency. Allow soaking for 2 - 3 minutes then adjust the consistency for use. It is easier to mix the product too thick and add water.
- Do not mix more GIB-Cove® Bond than can be used: 45 minutes working time for GIB-Cove® Bond 45, and 90 minutes working time for GIB-Cove® Bond 90.
- Do not mix with other wet or dry materials.
- Do not retain product that has started to harden or intermix with previously prepared material.
- Do no overmix the material, as unnecessary agitation will accelerate the set time.

- In position without the aid of temporary fixings provided the GIB-Cove® Bond has been mixed to the correct consistency.
- If the walls or ceilings are uneven, it may be necessary to use temporary fixings until the GIB-Cove® Bond has set sufficiently to allow the GIB-Cove® to support itself. At this stage the temporary fixings can be removed.
- Remove excess GIB-Cove® Bond from the GIB-Cove® edges with a broad knife and make good any joints with a small tool.
- Clean off surplus GIB-Cove® Bond with a damp sponge or brush.

Clean Up / Disposal

- Wash all tools and equipment with water prior to the material hardening. Spilt material should be left to dry and disposed of. Do not flush down drains. Empty packaging should be disposed of to landfill.

Painting

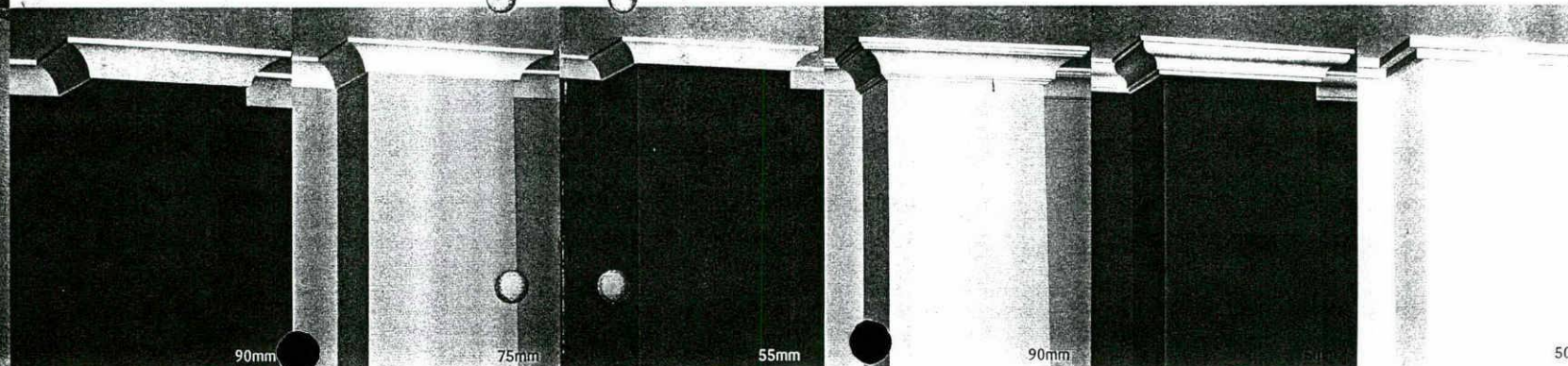
- Ensure GIB-Cove® surfaces are sealed and dry prior to painting.

Limitations

- GIB-Cove® Bond is specifically formulated and tested for use on GIB-Cove®.
- Always fix GIB-Cove® prior to painting or skim coating.
- Do not use GIB-Cove® Bond for fixing GIB-Cove® to painted surfaces without some form of permanent fixing such as screws or nails.
- Water, air and surface temperatures above 10°C should be maintained until the compound is completely dry.

Specifications

Name	Size	Weight	Length
GIB-Cove® Classic	90mm	approx 1.27 kg/lm	3600mm
GIB-Cove® Classic	75mm	approx 1.00 kg/lm	3600mm
GIB-Cove® Classic	55mm	approx 0.68 kg/lm	3600mm
GIB-Cove® Treble	90mm	approx 1.25 kg/lm	3600mm
GIB-Cove® Soprano	75mm	approx 1.18 kg/lm	3600mm
GIB-Cove® Alto	50mm	approx 1.25 kg/lm	3600mm



GIB-Cove® Classic

GIB-Cove® Classic

GIB-Cove® Classic

GIB-Cove® Treble

GIB-Cove® Soprano

GIB-Cove® Alto

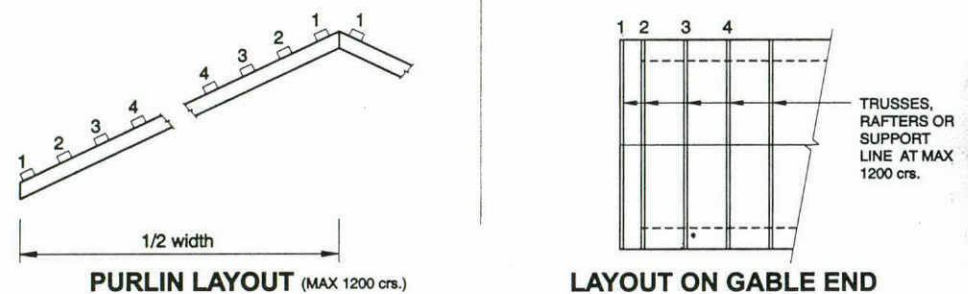
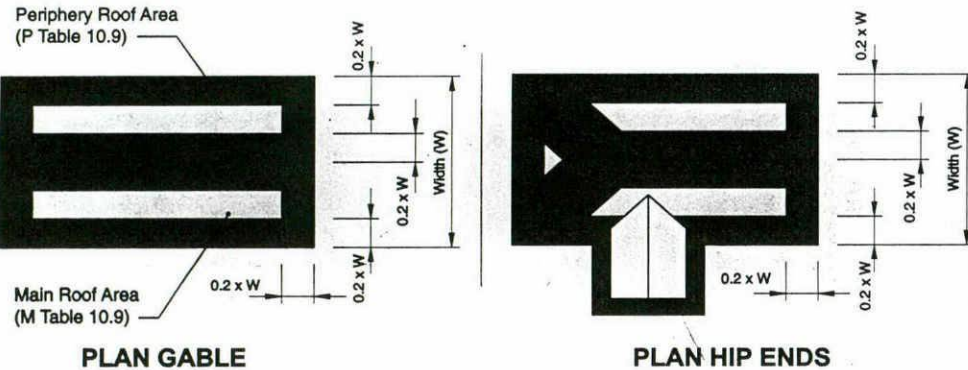
PURLIN & BATTEN FIXING CHART

02/4

(COMPLIES WITH NZS 3604:1999 TABLE 10.10)

NOTE:

- ★ Max. truss overall roof span 12m
- ★ All purlin and batten sizes as NZS 3604:1999 Section 10.
- ★ These fixings assume purlin or battens are fixed over top of truss or rafter.



SELECTION CHART

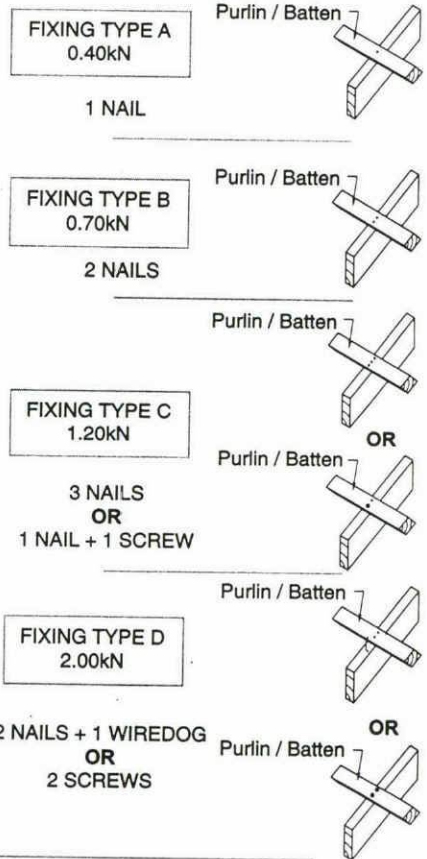
(minimum fixing requirements)

1. **HEAVY ROOFS**
All purlins and/or battens use fixing Type A only on roof width (w) up to 12m.
2. **LIGHT ROOFS**
 - A. **BATTENS** - Max. span 1200
- Max crs. 400
- Roof width (w) up to 12m.
L & M wind loads use Type B fixing on all battens.
H & VH wind loads use Type C on all battens.
 - B. **PURLINS** - Max. span 1200, Max crs. 900 or
- Max. span. 900, Max crs. 1200
L & M wind loads use Type C fixing on purlin No.2 and Type B on all other purlins for all roof widths (w) up to 12m.
H & VH wind loads
1. On roof width (w) up to 8m;
Use Type D fixing on purlin No. 2 and Type C on all other purlins.
2. On roof width (w) up to 12m;
Use Type D fixing on purlins No. 2 & 3 and Type C on all other purlins.
 - C. **PURLINS AND BATTENS ON GABLE END**
- Max. span 1200, Max crs. 900 or
- Max. span. 900, Max crs. 1200
L & M wind loads use Type B fixing on support line No. 1, Type C on support lines No. 2, 3, & 4 and all other support lines as per Section A or B above.
H & VH wind loads use Type C fixing on support line No. 1, Type D on support lines No. 2, 3, & 4 and all other support lines as per Section A or B above.

STANDARD FIXING OPTIONS

FIXING DEFINITIONS

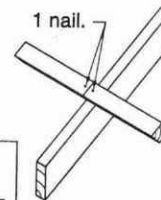
NAIL = Either 90 x 3.15 Power driven
or 100 x 3.75 Hand driven
SCREW = 100 x 10 gauge LUMBERLOK Purlin screw
WIREDOG = Either left hand or right hand LUMBERLOK wiredog.



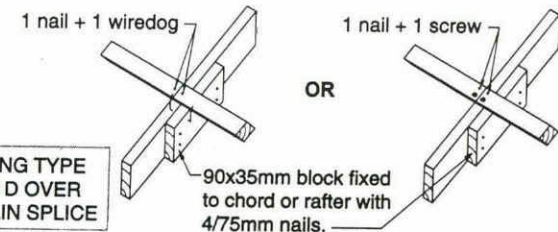
PURLIN / BATTEN SPLICE FIXING OPTIONS

NOTE:
Skew nail when fixing to 35mm rafter or truss.

FIXING TYPE A & B OVER PURLIN SPLICE



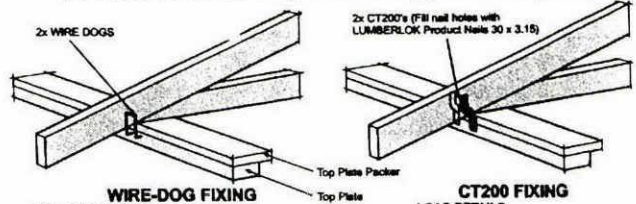
FIXING TYPE C & D OVER PURLIN SPLICE





LUMBERLOK TRUSS FIXING CHART

RAFTER TRUSS TO TOP PLATE FIXINGS (All WIRE DOG & CT200 fixings are into the top plate NOT the packer)



WIRE-DOG FIXING

LOAD DETAILS

Truss Span	9000 - 10000 Low to Medium Wind 3000 - 5000 High to Very High Wind
Roof Weight	Heavy or Light
Truss Centre	900 max.
Snow Load	to 1.0 kPa

CT200 FIXING

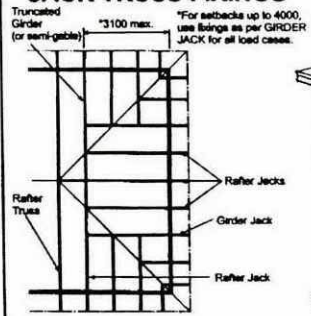
LOAD DETAILS

Truss Span	6000 - 15000
Wind	Low to Very High
Roof Weight	Heavy or Light
Truss Centre	900 max.
Snow Load	to 1.0 kPa

GIRDER TRUSS TO TOP PLATE FIXING

All girder trusses up to a span of 9000 and the above load details are to be fixed to the top plate using the CT200 FIXING shown above

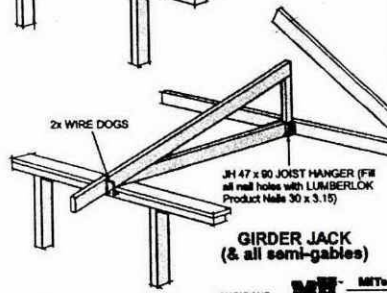
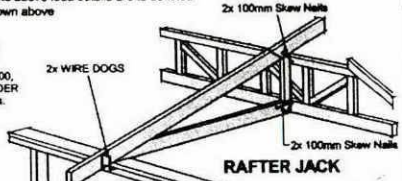
JACK TRUSS FIXINGS



LOAD DETAILS

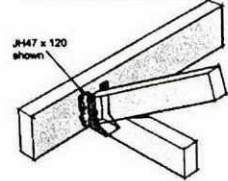
Truss Span	3100
Max. Wind	High
Roof Weight	Heavy or Light
Truss Centre	900 max.
Snow Load	to 1.0 kPa

*For Very High Wind, fix rafter jack as per GIRDER JACK



RAFTER TRUSS TO TRUSS FIXINGS

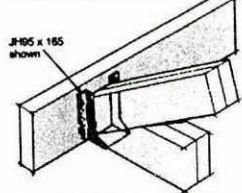
1. RIGHT ANGLE JOINTS SINGLE COMPONENT TRUSS



LOAD DETAILS

Truss Span	12000
Wind	Low to Very High
Roof Weight	Heavy or Light
Truss Centre	900 max.
Snow Load	up to 1.0 kPa
Max. Supported Truss Span	12000

DOUBLE COMPONENT TRUSS



Joist Hanger Size Single Component Truss
 JH 47 x 120 on Girder Bottom Chords up to 180 x 50 deep
 JH 47 x 180 on Girder Bottom Chords of 200 x 80 deep and above
 In all cases the max. area of roof supported (i.e. setback x supported truss span) not to exceed 48m²
Joist Hanger Size Double Component Truss - JH 95 x 165
 Fill all holes with LUMBERLOK Product Nails 30 x 3.15e

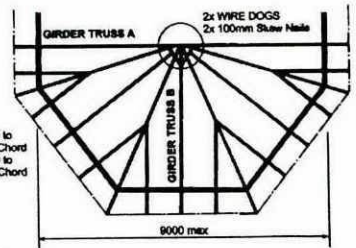
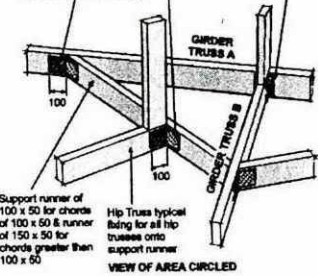
2. ANGLE JOINTS - Octagonal Roof

LOAD DETAILS

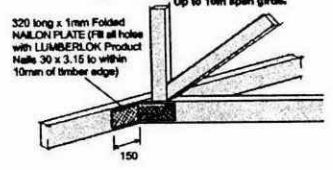
Max Supported Truss Span	9000
Wind	Low to Very High
Roof Weight	Heavy
Supported Truss Centre	900 max.
Snow Load	to 1.0 kPa

200 long x 1mm FOLDED NAILON PLATE (Fill all holes to within 10mm of the timber edge)

JH 47 x 120 for 100 x 50 to 180 x 50 Girder Bottom Chord
 JH 47 x 180 for 200 x 50 to 250 x 50 Girder Bottom Chord



Boomerang Roof



AUCKLAND
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