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INTRODUCTION

USG Boral Fiberock® Aqua-Tough™ is the ideal lining for high-traffic areas, wet areas, bracing walls and fire and noise barriers. Fiberock® Aqua-Tough™ linings are a unique, gypsum fibre product engineered to provide increased resistance to moisture, mould, abrasion, indentation and penetration for interior walls and ceilings in demanding construction applications. These gypsum-fibre sheets are designed to outperform paper-faced gypsum board. Strong, solid and durable, they include a water-resistant core for supreme durability and superior performance and are suitable for use in wet areas, including residential showers and tub surrounds.

Featuring high recycled content, moisture and fire resistance combined with very high impact and mould resistance Fiberock® Aqua-Tough™ is suitable for a wide range of projects including education, health, justice and aged-care.

Fiberock® Aqua-Tough™ linings are also the best USG Boral lining for use in bracing walls complying with NZS 3604:2011.

Easy to cut and install, these sheets are highly desirable and durable in both wet and dry environments alike.

Fiberock® Aqua-Tough™ linings can be used in ceiling applications as well as interior walls, including exterior areas protected from direct exposure to rain, such as alfresco dining, verandahs, carports, soffits or eaves that are horizontal, or incline down away from the building.

Fiberock® Aqua-Tough™ is Good Environmental Choice Australia (GECA) certified and may contribute to Green Star points when assessed under various Green Star rating tools.

![Diagram of Fiberock® Aqua-Tough™ 13mm Interior Lining](image)

**Face**: Mineral-rich surface, with factory-applied acrylic sealer. Superior substrate for paint, tiles, special coatings or laminates.

**Taper**: Large taper edge (recess) for very high joint strength (13mm/16mm thick sheets).

**Bevel**: Edge bevel provides superior resistance to joint peaking under humidity change. Also for ease of handling.

**Material**: Proprietary Fiberock® technology for enhanced strength, stiffness, and wall furniture-fixing capability.
## GENERAL INFORMATION

### NZBC COMPLIANCE

Fiberock® complies with the following performance criteria of the NZ Building Code (NZBC).

**TABLE 1: NZBC COMPLIANCE**

<table>
<thead>
<tr>
<th>BUILDING CODE CLAUSES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clause B1</td>
<td>Structure</td>
</tr>
<tr>
<td>Clause B2</td>
<td>Durability</td>
</tr>
<tr>
<td>Clause C1-C6</td>
<td>Protection from Fire</td>
</tr>
<tr>
<td>Clause E3</td>
<td>Internal Moisture</td>
</tr>
<tr>
<td>Clause F2</td>
<td>Hazardous Building Materials</td>
</tr>
<tr>
<td>Clause G6</td>
<td>Airborne &amp; Impact Sound</td>
</tr>
</tbody>
</table>

### INSTALLATION


### MAINTENANCE

Fiberock® does not require maintenance but USG Boral recommends that a visual check of the board be undertaken as part of normal maintenance, for instance when the surface coating is re-applied. In the event that damage to the Fiberock® board is apparent then it must be removed and replaced in accordance with the details outlined in this manual.

### PERFORMANCE DETAILS

**Fire**

Fiberock® is a non-combustible passive fire building product. It achieves a material Group Number of 1-S in accordance with ISO 5660 Parts 1 & 2.

**Acoustics**

Fiberock® can be used in an acoustic system to provide the required levels of sound insulation to achieve specified acoustic ratings. Refer to Systems+ manual for acoustic ratings.

**Wet Areas**

Compared to typical paper faced gypsum plasterboards, Fiberock® linings are more resistant to moisture absorption. As a result it is also more resistant to mould, achieving a top score of 10 (ASTM D3273).

**Bracing**

Fiberock® can be used as a structural bracing lining for compliance with wind and seismic requirements in residential timber framed and light commercial buildings, within the scope of NZS 3604:2011.

**Impact**

Fiberock® has excellent impact resistance (ASTM CI629) and is a suitable wall lining in high traffic environments such as corridors, hospitals, aged care and correction facilities.
**ADVANTAGES**

**Abuse Resistance:** Engineered to provide increased resistance to abrasion, indentation and impact, Fiberock® outperforms gypsum core paper-faced or glass mat-faced sheets, with no paper face to tear or scratch.

**Fire Resistance:** Fire rated wall systems up to 60 minutes (single layer) and 120 minutes (2 layers) and Group Number of 1-S surface burning characteristics.

**Noise Resistance:** High density gives superior noise control, including intertenancy-rated systems.

**Water resistance:** Water-resistant core and suitable for use in wet areas.

**Mould Resistance:** Superior to plasterboard linings – highest score of 10 to ASTM D3273.

**Bracing Resistance:** Superior to plasterboard linings.

**Fixture Attachments:** Suitable fixtures can be attached to linings (non-fire rated applications) without the need to screw into studs or noggings.

**Finishing Flexibility:** Excellent substrate for paint and tiles and a number of abrasion-resistant coatings such as wall vinyls and laminates.

<table>
<thead>
<tr>
<th>TABLE 2: USG BORAL FIBEROCK® ENVIRONMENTAL RATING AND APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Applications (both dry and wet areas)</strong></td>
</tr>
<tr>
<td><strong>✓</strong> Tile backer wall lining, lining of eaves and canopies; acoustic underlay on framed floors.</td>
</tr>
<tr>
<td><strong>✓</strong> Interior wall and ceiling linings — widely used in settings for education, medicine and aged care, as well as institutions, offices and quality residential buildings.</td>
</tr>
<tr>
<td><strong>✓</strong> Interior wall and ceiling linings — especially in tenanted apartments and corridor walls.</td>
</tr>
</tbody>
</table>

**SUSTAINABILITY**

Fiberock® linings are made from 95% recycled material and are GECA certified.

**WASTE MINIMISATION**

For non-braced and/or non-fire rated walls, Fiberock® offcuts may be used by simply rebating all four edges (when required).
GENERAL INFORMATION

REFERENCES
Refer to www.usgboral.com for information on Fiberock®. Test results may be available upon request, providing the information is not commercially sensitive.

WARRANTY
For details of the USG Boral warranty refer to www.usgboral.com

DURABILITY STATEMENT
This statement is in relation to Clause B2 Durability of the NZBC. USG Boral Fiberock® systems, when installed in accordance with the installation instructions detailed within the relevant technical installation literature, are fully compliant with the NZBC.

HEALTH & SAFETY
It is important to follow good site safe practices at all times and to ensure appropriate safety precautions are taken when installing USG Boral Fiberock® systems and all supporting components. Refer to page 10.

STANDARDS
The following American, Australian and New Zealand Standards and other documents are referenced in this publication:

- AS/NZS 2588: 2018 Gypsum Plasterboard
- AS/NZS 2589:2017 Gypsum linings – Application and finishing
- AS 2753: 1985 Adhesives – Mastic - For bonding gypsum plaster linings to wood and metal framing members
- AS/NZS 4858:2004 Wet area membranes
- ASTM C1278 Standard specification for fiber-reinforced gypsum panel
- ASTM C1629 Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels
- AS 3740:2010 Waterproofing of domestic wet areas
- AS 1530.4:2014 Fire-resistance test of elements of construction
- NZS 3604:2011 Timber-framed buildings
- AS/NZS 4600:2018 Cold-formed steel structures
- NASH Standard Part Two: 2019 – Light Steel Framed Buildings
- AS 3566:2002 Self-drilling screws for the building and construction industries.
Fiberock® is suitable for use in wet area systems. USG Boral Wet Area Systems have been assessed by BRANZ as meeting the relevant NZBC performance clauses. For full system options refer to BRANZ Appraised USG Boral’s Wet Area Systems Manual.

Fiberock® lining options have been BRANZ P21 tested to provide structural bracing for residential timber framed buildings within the scope and limitations of NZS 3604:2011. For system options and installation refer to BRANZ Appraised USG Boral’s Brace+ Plasterboard Bracing Manual and online Brace+ software.

Fiberock® is used in multiple steel and timber load-bearing and non-load-bearing passive fire rated wall systems, as per the Quick Selection summary tables on pages 59-63. For full system options, refer to USG Boral’s Systems+ Fire and Acoustic Manual – NZ.
CREATIVE & PRACTICAL ADVANTAGES

The Creative Edge

Fiberock® offers entirely new possibilities for edge finishing and display. Its uniquely workable properties render the essentially two-dimensional limitations of plasterboard or fibre cement obsolete, by adding a third dimension of depth.

Because of the make up of typical gypsum plasterboards, exposing the edge is not normally feasible because of roughness in the interfaces between the paper surfaces and the gypsum core. The lack of reinforcement throughout the brittle core also prevents the edge being profiled. This is not the case with Fiberock®, which can be worked with normal woodworking tools on site. A number of distinctive profiles can be achieved using either routers or planes, opening up many creative possibilities for layered wall and ceiling effects. Edge detailing requires precision machining, as well as extra attention during finishing.

For Hanging Pictures In Exactly The Right Place

Gone are the days of knocking on walls or ceilings to locate studs or something of substance to hang pictures, light fittings and other wall furniture. Gone also are the days of having to hang art in a slightly off-centre position because that happens to be where the stud is located.

With Fiberock® there is no need for hammer drills to make holes in concrete or brick, and no unsightly chunks of concrete or brick breaking out through imprecise workmanship.

For non-fire rated systems, simply screw picture hooks and wall furniture directly into the lining, regardless of where the studs are. Fiberock® 13mm linings can take loads of up to 13kg per screw at the screw head (16mm 16kg, 10mm 10kg). Additional loads can be supported using Hilti HHD-S cavity anchors. (Refer to Hilti for installation and load limitations.)
SHEET SIZES & QUANTITIES

Fiberock® Sizes

**TABLE 3: FIBEROCK® SIZES AND AVAILABILITY**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>EDGE PROFILE</th>
<th>THICKNESS (mm)</th>
<th>WIDTH (mm)</th>
<th>LENGTH (mm)</th>
<th>WEIGHT (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIBEROCK®</td>
<td>SE</td>
<td>10</td>
<td>1200</td>
<td>●</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>RE</td>
<td>13</td>
<td></td>
<td>●</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td></td>
<td>●</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Notes: SE = Square Edge, RE = Recessed Edge.

Material Quantities

Fiberock® approximate fixing and jointing requirements and coverage areas are given in the following tables:

**TABLE 4: FIXING AND JOINTING COMPOUNDS per 100m² of FIBEROCK®**

<table>
<thead>
<tr>
<th>FRAME SPACING</th>
<th>WALLS</th>
<th>CEILINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>600mm</td>
<td>450mm</td>
</tr>
<tr>
<td>FIXING METHOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screws only (QTY/100m²)</td>
<td>910</td>
<td>1050</td>
</tr>
<tr>
<td>JOINTING MATERIALS*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tape</td>
<td></td>
<td>75m</td>
</tr>
<tr>
<td>Base Compounds (1st and 2nd coats incl. angles)</td>
<td></td>
<td>16kg to 22kg</td>
</tr>
<tr>
<td>Finishing Compounds (finishing coat only)</td>
<td></td>
<td>8kg to 10kg</td>
</tr>
</tbody>
</table>

* Based on horizontal sheeting. The coverage rates are approximate and should be used as a guide only. The figures may vary significantly due to onsite practices and environmental factors.

**TABLE 5: BOARD COVERAGE AREA m²**

<table>
<thead>
<tr>
<th>WIDTH mm</th>
<th>LENGTH mm</th>
<th>NUMBER OF SHEETS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 20 30 40 50 60</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>2700 3.24 6.48 9.72 12.96 16.20 19.44 22.68 25.92 29.16 32.40 36.60 40.80 45.00 49.20</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>3.60 7.20 10.80 14.40 18.00 21.60 25.20 28.80 32.40 36.00 39.60 43.20 46.80 50.40 54.00</td>
<td></td>
</tr>
</tbody>
</table>
HANDLING & STORAGE

USG Boral strongly recommends that Fiberock® is stored in a horizontal, flat stack, and will only deliver to sites that allow for this type of stacking.

Consider the following measures to maintain product quality and site safety when selecting the Fiberock® storage area:

- Fiberock® is stacked flat (horizontally), in a safe, dry place where it is unlikely to be damaged.
- The floor area where the Fiberock® is stored is clean and dry.
- The floor area around the Fiberock® stack is sufficient for safe access and passage, allowing other trades to carry on with their duties.
- The building is weatherproof.

Stacking Fiberock®:
- Maximum load restrictions may apply to timber and concrete floors when stacking Fiberock® sheets.
- It is important to ensure that timber and concrete floor loading restrictions are not exceeded.
- Before loading and stacking of Fiberock® sheets takes place, seek advice from someone who is qualified to provide this advice.
- The Fiberock® sheet sizes and weights shown in Table 6 can be used to calculate the quantity of sheets that can be stacked.

### Table 6: Sheet Weights

<table>
<thead>
<tr>
<th>Sheet Size</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2700mm length sheets</td>
<td></td>
</tr>
<tr>
<td>10mm - 2700 x 1200</td>
<td>32.4</td>
</tr>
<tr>
<td>13mm - 2700 x 1200</td>
<td>38.9</td>
</tr>
<tr>
<td>16mm - 2700 x 1200</td>
<td>48.6</td>
</tr>
<tr>
<td>3000mm length sheets</td>
<td></td>
</tr>
<tr>
<td>10mm - 3000 x 1200</td>
<td>36.0</td>
</tr>
<tr>
<td>13mm - 3000 x 1200</td>
<td>43.2</td>
</tr>
<tr>
<td>16mm - 3000 x 1200</td>
<td>54.0</td>
</tr>
</tbody>
</table>

How To Position A Load

- Billet width and height should be uniform.
- Billet length should correspond to Fiberock® width, i.e. 1200mm-long billets for 1200mm-wide Fiberock®.
- Billets placed at max 600mm centres.

Placing Billets

All billets are to be placed so each billet is spaced evenly.

Figure 4: Correct placement of billets
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12 Steel Framing
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15 Recommended Tools

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17 Internal Corner Details
18 Control Joint Details
19 Door Jambs
19 Shadowline Stopping Angle
20 Wall-Ceiling Junctions

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35 Soffits, Covered Balcony & Alfresco Areas
PRE-INSTALLATION

Framing Check
Prior to installation of Fiberock®, framing should be thoroughly checked by the builder to ensure it meets NZS 3604 and the following:

- Framing is plumb, level and square.
- Spacing of studs, joists and battens does not exceed the limits specified in the relevant sections of this manual.
- Maximum deviations in the bearing surface of the finished framing do not exceed the maximum tolerances allowed for the required Level of Finish (refer to Table 7 Framing Tolerances). Where these tolerances are exceeded, a suitable levelling system should be used.
- Noggings supporting services such as taps and cisterns do not protrude beyond the face of the framing.
- All openings are framed and ceiling perimeter battens are installed where required.
- Trimmers are installed where primary ceiling support members, such as girders, trusses and joists, change direction within a room, or where required to support ceiling loads.
- All contact surfaces are dry, clean and free from foreign materials such as oil, grease and dirt.
- Plumbing and electrical services have been installed and do not protrude beyond the face of the framing.
- The area is weatherproof.

<table>
<thead>
<tr>
<th>TABLE 7: FRAMING TOLERANCES (mm)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME ROOF AREA</td>
</tr>
<tr>
<td>90% of area</td>
</tr>
<tr>
<td>Remaining area</td>
</tr>
</tbody>
</table>

* Deviation at any point of the bearing surface of the finished framing immediately prior to installation of lining when measured with 1.8m straight edge. (AS/NZ 2589: 2017)

Fixing Face Requirements
Minimum widths of framing member fixing faces are shown in Table 8:

<table>
<thead>
<tr>
<th>TABLE 8: MINIMUM WIDTHS OF FIXING FACES (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIXING FACE TYPE</td>
</tr>
<tr>
<td>Supporting a joint</td>
</tr>
</tbody>
</table>

Fiberock® can be installed directly over existing linings if they are firm, sound and sufficiently flat for the required level of finish (ensure fasteners are of sufficient length to allow for the thickness of existing linings).

Timber Framing
Timber framing substrates for Fiberock® linings must comply with the current NZS 3604:2011 Timber framed buildings.

Roof trusses must comply with NZS 3604, AS/NZS 1170 and truss manufacturers specifications.

- Fiberock® is not to be installed to timber with a moisture content greater than 18% at the time of lining. Generally seasoned or kiln-dried timbers such as Radiata Pine meet this criterion.
- Only mechanical fastener fixing methods are to be used.

Steel Framing

The framing must be assembled and installed in accordance with the manufacturer’s installation procedures.
**Linings Layout**

- Carefully plan installation to ensure best coverage and to minimise butt joints and wastage.
- Horizontal fixing is the preferred wall sheet orientation for a Level 4 finish, as it minimises the effects of glancing light, reduces jointing, and places joints at a convenient height for stopping. Sheets may be vertical if they cover the whole wall. Fiberock® bracing sheets must be installed with vertical orientation. Refer to the bracing section for further details.
- Where possible, sheets should run across doors and windows and be cut out after fixing. The cut-outs can be used to cover small areas.
- Full-length sheets should be used where possible to eliminate the need for sheet-end butt joints.
- Where sheet-end butt joints are necessary, they must be positioned on framing members.
- Stagger butt joints on adjoining sheets and with those on the opposite sides of the wall.
- Vertical joints should be kept to a minimum of 200mm from the edge of openings.
- Ceiling sheets should be installed with the long edge at right angles to the direction of the support members. The use of panel lifters will assist in placement and fixing of ceiling sheets.
- Provide control joints in walls and ceilings (refer to Control Joints on page 18).
- Fiberock® should preferably be installed to ceilings first, and then to walls. This will minimise sheet handling and damage.
- Noggings must be positioned behind recessed joints in horizontal applications.
- For general installation, allow for a 10mm (max) gap between Fiberock® and floor/ceiling. For fire-rated and bracing walls the Fiberock® sheets must be installed hard against the floor/ceiling.
**PRE-INSTALLATION**

**Fasteners**

- Fiberock® should be fixed to framing using screw fasteners only. Fiberock® cannot be fixed using adhesive or glue.

- Fiberock® sheets must be held firm against framing while driving fasteners.

- Fixing of the sheet to commence from the centre of the sheets then outwards to the perimeter of the sheet.

- Screw types should be slightly overdriven to allow for stopping, but should not break the face.

- Screws should be positioned 10–16mm from sheet edges and ends.

- Screws should be selected from Tables 9 and 10.

- Screws used for Fiberock® fixing must comply with AS 3566 Self-drilling screws for the building and construction industries. Part 2: Corrosion resistance requirements.

<table>
<thead>
<tr>
<th>TABLE 9: FIBEROCK® SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREW TYPE</td>
</tr>
<tr>
<td>S</td>
</tr>
<tr>
<td>W</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>L&lt;sup&gt;10&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

* BMT – Base Metal Thickness

**Screws**

<table>
<thead>
<tr>
<th>TABLE 10: PLASTERBOARD-TO-FRAME FASTENERS — WALL AND CEILING SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLASTERBOARD THICKNESS mm</td>
</tr>
<tr>
<td>1 x 10</td>
</tr>
<tr>
<td>1 x 13</td>
</tr>
<tr>
<td>1 x 16</td>
</tr>
<tr>
<td>2 x 10</td>
</tr>
<tr>
<td>2 x 13</td>
</tr>
<tr>
<td>2 x 16</td>
</tr>
</tbody>
</table>

Notes:
1. Screws must meet AS 3566 – Corrosion Class 1.
2. “S” = a needle-point, bugle-head Type S gypsum fine-thread screw for fixing to steel gauges of up to 0.75mm BMT.
3. “W” = a needle-point, bugle-head Type W gypsum coarse-thread screw for fixing to hardwood and softwood framing.
4. “D” = a drill-point, bugle-head Type D gypsum fine-thread screw for fixing to steel gauges 0.80–2.00mm BMT.
5. “L” = a needle-point, bugle-head Type L gypsum coarse-thread screw for fixing plasterboard to plasterboard.
6. Screw designation given as (minimum screw gauge) – (threads per inch +1) x (minimum screw length).
7. For ease of construction with framing steel gauges of less than 0.8mm BMT, use 30mm minimum screw length.
8. Correct screw length is critical when fastening to resilient furring channel, to avoid acoustic bridging.
9. Popping of fasteners may occur with unseasoned timber.
10. For wall systems only. Tables to be read in conjunction with Fiberock® installation details.
Recommended Tools

- Sheets may be cut by scoring and snapping or by sawing, working from the face side.

- When using the score-and-snap method, score the sheet twice with a sharp utility knife, and snap the sheet away from the cut face. The backside of the sheet is then broken by snapping the sheet in the reverse direction.

- Shear tools for the appropriate thickness Fiberock® can also be used.

- If using a power saw, ensure it is equipped with a dust-collection device.

- If a power-operated saw is used, a low-RPM unit with a 165mm diameter carbide blade is recommended.

- A jigsaw with a coarse blade is also suitable, especially for non-straight cuts.

- Power tools may create dust so it is recommended to use dust-extraction units and dust masks when using this type of equipment.

- When necessary, use a rasp and lightly sand with sandpaper to smooth snapped or cut edges.

- Holes for pipes, fixtures and other small openings can be cut out with a hole saw or a drywall router.

- A mechanical planer equipped with a dust-collection device can be used to create a recessed joint on the square butt ends of Fiberock® sheets, or where sheets have been cut to odd sizes.
TIMBER WALLS (NON-FIRE-RATED)

Fixing Details

- Fiberock® must be fixed using a full fastener system. Adhesive is not permitted.
- Space screws at 300mm maximum centres at internal and external corners and around door and window openings.
- Space screws at 200mm maximum centres where butt joints fall on a framing member (Level 3 finish only).
- Refer to Figures 9 and 10 for horizontal and vertical wall fastener layout for general installation.
- Refer to Fastener details on page 14.
- For bracing, fire and wet area walls, reduced screw spacings may be required.
- Refer to the Fire and Acoustic Systems section for fixing multiple layers of Fiberock®.

**MIN. JOINT OFFSETS (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
<th>Vertical Joints</th>
<th>Horizontal Joints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single layer</td>
<td>One stud spacing (600mm min)</td>
<td>600</td>
</tr>
</tbody>
</table>

**MAX. SCREW SPACING (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
<th>Intermediate Studs</th>
<th>Vertical Butt Edges</th>
<th>Int/Ext. Corners &amp; Around Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single layer</td>
<td>300</td>
<td>200</td>
<td>300</td>
</tr>
</tbody>
</table>

- Refer to Fiberock® Screws, Table 9 & 10, page 14

**MIN. JOINT OFFSETS (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
<th>Vertical Joints</th>
<th>Horizontal Joints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single layer</td>
<td>One stud spacing (600mm min)</td>
<td>600</td>
</tr>
</tbody>
</table>

- Fasten board into top and bottom plates at stud positions
- Screws 10mm min from sheet edges and sheet ends

**MAX. SCREW SPACING (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
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<tbody>
<tr>
<td>Single layer</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

- Fasten board into top and bottom plates at stud positions
- Screws 10mm min from sheet edges and sheet ends

Refer to the Fire and Acoustic Systems section for fixing multiple layers of Fiberock®.
**Butt Joints in Walls**

Wherever possible, avoid the need for butt joints by using full-length Fiberock® sheets.

If sheets must be joined 'end-to-end', the joints should fall within 50mm of the mid-span between framing members. Butt joints greater than 400mm in length and less than 2m above floor must be back-blocked with nominal 400mm-wide back-blocking panels for the length of the joint. Butt joints on opposite sides of the wall should fall between different framing members.

Note: Butt joints in walls may be made on a framing member only if a Level 3 finish is required. Butt joints can be site planed to provide a recessed joint for Level 4 or 5.

**Internal Corner Details**

The ends of Fiberock® sheets at internal corners may be supported by one of two methods described in the figures below.

Where two studs are used, the sheets can be screwed on either side of the corner. Method 2 uses a Rondo F40 metal angle to support sheet ends at internal corners with only one stud.

**Method 1**

(Internal corner with 2 studs illustrated).

- Fit the underlying sheet (1) firmly into corner and fasten along the edge at 300mm max centres.
- Fit the overlapping sheet (2) with the edge firmly against the first sheet and fasten at 300mm max centres.

**Method 2 - Must be used in wet areas**

(Internal corner with 1 stud and metal angle illustrated).

- Cut the F40 metal angle 10mm shorter than the wall height and fix the angle to the stud @ 600mm centres.
- Fit the underlying sheet (1) fully into the steel angle and fasten at 300mm max centres.
- Fit the overlapping sheet (2) hard up against the underlying sheet and fasten at 300mm max centres.
TIMBER WALLS

Control Joint Details

Fiberock® linings are not designed to withstand stresses due to structural movements or excessive changes in temperature or humidity.

Potential stress build up, joint peaking, screw popping and cracking can be minimised by incorporating control joints as follows:

- Provide control joints in walls and ceilings at maximum 12m intervals in both directions (max 6m intervals in external ceilings) and at every change of lining material type (e.g. gypsum board to fibre cement).

- Provide horizontal control joints at mid-floors in stairwells in multi-storey buildings.

- Place Fiberock® control joints over movement joints in the substrate and at every change of substrate material.

- Utilise floor-to-ceiling openings as control joints.

- Fit double studs or joists, spaced slightly apart, in the frame at control joint locations (refer to pages 70 and 81).

- Control joints should extend through cornice.

- Ceiling battens should be discontinued at control joint locations.

- Control joints can be formed by fitting a #093 Zinc control joint or plastic expansion beads that leave a neat, clean and flexible joint.

Note: Proprietary control joint sections are designed to accommodate normal expansion/contraction movements in Fiberock® linings and substrates, but not significant structural movements. Other solutions may be required in such situations.

Installation Procedure (Zinc Control Joint #093):

- Leave a gap of 13mm (nominal) between the ends of Fiberock® sheets.

- Insert the surface-mounted #093 Zinc control joint in the gap and fix by stapling or nailing onto the board at 150mm centres.

- Stop and finish the joint.

- When dry, remove the filament tape, protecting the centre of the #093, to leave a clean, neat joint.

- Do not apply jointing compounds to the internal groove.
Door Jambs

Figure 16: Door jamb with architraves

Figure 17: Door jamb with shadowline stopping angle

Shadowline Stopping Angle

Shadowline Stopping Angle can be used to finish Fiberock® neatly where:

• a set joint or internal corner is not possible
• cracking may occur
• a shadowline effect is required, such as:
  – Fiberock® and masonry wall junctions
  – ceiling and wall junctions
  – door and window jambs.

Figure 18: Shadowline stopping angle
TIMBER WALLS

Wall–Ceiling Junctions

Common treatments of timber-framed Fiberock® wall-ceiling junctions include the following:

- Ceiling lining
- Cornice fixed as per the USG Boral specification
- Wall lining

Figure 19: **Cornice Detail 1** (unsupported)

- Ceiling lining
- Shadowline Stopping Angle
- Wall lining

Figure 20: **Shadowline Angle 1**

- Ceiling lining
- Perimeter support-angle screw fixed to top plate @ 600mm max ctrs (100mm max from ends). Screw fix plasterboard to angle @ 300mm max ctrs
- Cornice fixed as per USG Boral Site+ guide.
- Wall lining

Figure 21: **Cornice Detail 2** (perimeter supporting angle)

- Ceiling lining
- Shadowline Stopping Angle
- Wall lining

Figure 22: **Shadowline Angle 2**

- Ceiling batten or furring channel
- Ceiling lining screw fixed to end battens @ 150mm max ctrs
- Square set corner stopped as per internal corners
- Wall lining

Figure 24: **Square set**

Note: Ceiling battens or furring channels are recommended for square set finish to minimise the risk of localised cracking.
MASONRY WALLS

Installation Using Furring Channels

This installation method is particularly recommended for fixing to precast concrete panels.

Metal furring channels can either be direct fixed or clipped:

Direct-fixed channels
• Use one of the following:
  - Rondo F37 Furring Channel
  - 42mm x 19mm (min) timber battens.
• Pack where required to achieve a true surface.
• Fix to masonry with suitable fasteners.

Clipped channels
• Use one of the following furring channels and fixing clips:
  - Rondo F37 Furring Channel with Rondo FCMC or FTRC clips
  - Rondo 129 Furring Channel with Rondo 237 clip.
  - Refer to Rondo for other fixing clip options. For example the BG01, BG02, BG03 or BG05 adjustable clips which suit the Rondo 129.
• Set out fixing clips for vertical channels spaced at maximum 600mm centres and for top and bottom horizontal channels.
• Pack clips where required to achieve a true surface.
• Fix clips to masonry with suitable fasteners.

Fix Fiberock® to furring channels using fasteners only, then joint and finish in the normal manner.

Fixing to Irregular Wall Surfaces

Wall surfaces that have high/low spots over 15mm or are out of plumb by more than 15mm will need to be straightened with a series of levelling pads. Fiberock® is a suitable material using for levelling pads. Alternatively use Rondo furring channels with suitable clips such as; Rondo FCMC or FTRC.

Masonry adhesive is suitable for surfaces up to 25mm maximum out of plane.
INTERNAL CEILINGS

General Notes

• Fiberock® is not a suitable lining for fire rated ceiling applications. Refer to USG Boral Systems+ manual for fire rated ceiling systems using USG Boral Firestop® and Multistop™4 plasterboards.

• Fiberock® must be fixed using a full fastener system. Adhesive is not permitted.

• Framing – Dimensions must comply with the requirements of NZS 3604:2011.
  – The use of 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 the moisture content of the timber battens is in the 12-16% range. This will reduce 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.
  – Battens or ceiling joists shall be spaced as follows:
    – 13mm and 16mm Fiberock® linings – 600mm centres maximum.
  – Attach the sheets to framing supports by spacing fasteners not less than 10 – 16mm from edges and ends of the sheets, and drive as recommended for the specified fastening method. Drive fasteners in center of sheets first, working toward ends and edges.
  – Ensure fastener heads are driven slightly below the surface level.

• Sheet layout – 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 they are attached. All ceiling battens in a single area need to run in the same direction to enable this. Sometimes this will require sheet end-to-end joints. These joints should be tapered on site, and either back-blocked or supported by a nog. Failure to do this will result in a tapered edge/cut edge joint at a point that is highly susceptible to cracking.

• Butt joints – for a Level 4 finish, it is recommended that all ceiling butt joints be tapered and back-blocked. A Level 5 finish must be back-blocked. The Fiberock® lining composition allows butt or cut ends to be hand or mechanically tapered for a superior joint.
Ceiling Lining Support Options

There are two general support options for ceiling linings:

1. Direct fixed, with sheets fixed directly to structural ceiling members. If Fibreck® is direct fixed to structural ceiling members, blocking are to be installed by the builder where primary ceiling support members, such as girder trusses and joists, change direction within a room (see figure 29).

2. Furred or battened fixing, with sheets fixed to secondary framing members, such as metal or timber battens or metal furring channels installed perpendicular to structural members (see figure 30).

Notes:

• Experience has shown that metal battens or furring channels will generally produce a superior ceiling and it is the recommended method for use under trussed roofs and for ceilings with square set finish.
• Ceiling battens and furring channels should stop at least 10mm clear of non-load-bearing internal walls, so as not to impede truss or floor joist deflection.
• End-to-end joints in USG Boral battens should be made using appropriate details (see Figure 31). Stagger adjacent end-to-end joints between different framing members.
• For ceiling diaphragms refer to the Bracing Section.

Figure 30: Furred ceiling direct fixed

Join Furring Channels by overlapping 200mm minimum and securing with four pop rivets or 8g-16 x 12mm (minimum) self drilling wafer head screw. Offset joints across ceiling.

Figure 31: Ceiling Lining Support detail.
INTERNAL CEILINGS

Metal Suspended & Direct- Fixed Systems

USG Boral recommends the following metal components and systems for Fiberock® ceilings:

Rondo® Furring Channel or Batten Ceiling Systems

Figure 32: Rondo ScrewFix® Furring Channel or Batten System

Figure 33: Rondo Xpress® Drywall Grid System
Control Joint Details
See Control Joint Details on page 18 for guidance on control joint locations and construction.

Fixing Details

• Space screws at maximum 300mm centres across the width of the sheet.

• At sheet ends space screws at 300mm maximum centres for cornices and 150mm maximum centres for square set finish.

• See Tables 9 & 10 on page 14 for screw types.

• See Table 11 and Figure 34 for the number of screwing points across the sheet width.

• Fiberock® linings must be fixed with screws only.

Note: Screw points should be equally spaced at 300mm ctrs max.

<table>
<thead>
<tr>
<th>SHEET WIDTH</th>
<th>SCREW POINTS (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200mm</td>
<td>5</td>
</tr>
<tr>
<td>900mm</td>
<td>4</td>
</tr>
</tbody>
</table>

Figure 34: Screw fixing (only) layout for ceilings
INTERNAL CEILINGS

Perimeter Detail Options

Figure 35: Perimeter detail with pre-painted wall angle

Figure 36: Perimeter detail for square stopping

Figure 37: Perimeter detail with timber trim

Note: Cove, shadowline and square stopping options are detailed on page 20.
Back-Blocking

Back-blocking is a reinforcing system designed to minimise cracking and deformation along recessed edge and butt joints.

Back-blocking consists of Fiberock® panels adhered to the back of sheet joints. USG Boral recommends the use of USG Boral Back-Blocking Adhesive or Cornice Adhesive – do not use stud adhesive.

**Adhesive should be applied to back-blocking panels with a 6mm notch trowel.**

Standard AS/NZS 2589:2017 *Gypsum lining — Application and finishings* requires back-blocking of:

- all butt joints in ceilings
- recessed joints in Level 4 finish ceilings in any room containing three or more recessed joints
- all recessed joints in Level 5 finish ceilings.

*Note:* USG Boral recommends that all ceiling joints should be back-blocked.

**TABLE 12: BACK-BLOCKING ADHESIVE**

<table>
<thead>
<tr>
<th>Suitable For</th>
<th>Bonding</th>
<th>Patching</th>
<th>Compound Type</th>
<th>Working Times</th>
<th>Product Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✔</td>
<td>✗</td>
<td>Setting</td>
<td>120 mins</td>
<td>20kg bag</td>
</tr>
</tbody>
</table>

**Butt Joints in Ceilings**

Wherever possible, avoid the need for butt joints by using full-length sheets.

If this is not possible, unlike plasterboard, Fiberock® butt joints can be hand or mechanically planed to create a recessed edge. This can be back-blocked between framing members or the join can be positioned over a framing member.

If sheet joints fall mid-span between framing members then they must be supported by back-blocking panels (nom 200mm wide) for the length of the joint or between Rondo Stitching battens (see Figures 40-42).
INTERNAL CEILINGS

Back-Blocking Butt Joints

Butt joints can be back-blocked by forming a recess in the Fiberock® face, where the sheet ends meet, using a Rondo Stitching™ Batten (B005) or temporary wooden battens and packers. Where possible, it is recommended to mechanically rebate butt joints for a superior finish (refer page 15).

Figure 40: Back-blocking using Rondo Stitching Batten

Figure 41: Back-blocking using temporary batten and packer (suitable method for 10mm Fiberock® only)

Figure 42: Back-blocking using battens — plan view
EXTERNAL CEILINGS

General Notes

Fiberock® linings can be used in ceiling applications, as well as interior walls. This can include exterior areas protected from direct exposure to rain, such as alfresco dining, verandas, carports, soffits or eaves that are horizontal or incline down away from the building.

This section provides guidelines for the correct installation for exterior areas, as these are subject to more extreme loads and environmental conditions, and require more fixing and detailing than interior installations.

Typical factors contributing to these extra loads include:

• wind loads
• condensation
• insufficient perimeter support
• exposure to atmospheric variations (e.g. humidity, temperature, etc.).

Notes:
• External ceilings left unpainted for prolonged periods of time should be covered with a sealer coat to reduce the risk of board and compound deterioration.
• All-purpose compounds are not recommended for external applications.
• The use of plastic external angles in highly corrosive environments is required.

Design Notes

• Refer to Table 13 for maximum frame and screw spacings for external ceilings.
• Provide adequate ventilation to prevent heat build up and condensation pooling on the top of Fiberock® linings.
• Provide a minimum 6mm-wide gap between the edges of ceiling linings and adjacent walls, beams, columns and fascias.
• Fascia boards and perimeter beams should extend a min 25mm below Fiberock® linings to provide a drip edge.
• Screws used for fixing of external ceiling linings must comply with AS 3566 Self-drilling screws for the building and construction industries. Part 2: Corrosion resistance requirements.
EXTERNAL CEILINGS

Installation of External Ceilings

- Spacing between framing members should not exceed the maximum values indicated in Table 13. In areas where these values are exceeded, suitable ceiling battens or furring channels should be provided at required spacings for exterior applications.

- Framing must be provided at sheet ends for support and fixing, both at perimeters and where sheets butt together. Stagger adjacent butt joints (see Figure 43).

- Ceiling linings should be fully screw fixed at the maximum spacings indicated in Table 13. Refer to Tables 9 and 10 for screw types.

- At sheet ends, space screws at 300mm maximum centres for timber cornices and 150mm maximum centres for square set finish.

- Run Fiberock® sheets at right angles to framing members.

- Back-block all joints in ceiling linings as per USG Boral back-blocking specifications (see Figure 43).

- Control joints must be provided in external ceilings at maximum 6m centres in both directions, or where there is a structural building control joint.

- External ceilings should be painted with a three-coat Dulux exterior paint system including a sealer undercoat and applied in accordance with manufacturer’s recommendations (see page 37).

- Roof cladding must be completed and sealed before installation.

| TABLE 13: MAXIMUM FRAMING AND FIXING SPACINGS FOR EXTERNAL CEILINGS |
|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| CEILING LINING   | NZS 3604 WIND ZONE |
|                  | LOW  | MEDIUM | HIGH | VERY HIGH | EXTRA HIGH |
| 13/16mm FIBEROCK® | Max Framing Spacing (mm) | 450   | 450   | 300 | 300 | 200 |
|                  | Max Screw Spacing (mm)      | 300   | 300   | 250 | 200 | 200 |
Non-Fire Rated Soffits

- Provide adequate cross-ventilation to prevent condensation on the back of the lining.
- For skillion roof style or high temperature climates, the cavity must be vented to avoid excessive heat build up (see to page 34).
- Fascia boards are to extend a minimum of 15mm below the Fiberock® or any perimeter trims to provide a drip edge.
- Fiberock® soffits, eaves and canopies are not to be used around swimming/spa pools, or in other enclosed spaces where excessive humidity levels occur, as chlorine gas may accumulate and corrode screws and affect the integrity of the system.
- Provide a 6mm gap between the edges of the Fiberock® sheets and where they abutt walls, beams, columns and fascias. Ends may be finished with casing beads, wall angles or scotia perimeter trims as in Figures 35-37. Highly corrosive regions may require the use of alternative materials to steel casing beads.
- Screw fix only at 300mm centres maximum, 200mm at sheet ends. Use Type W screws x 32mm for timber, or Type S or D x 25mm for steel battens.
- Joints not on framing members must be back-blocked as per Figure 43. Form back-blocks from Fiberock®, at least 200mm wide and long enough to fit easily between framing members (no more than 20mm gap at either end). Due to Fiberock’s® paperless face, butt joints on framing members or back-blocks, can simply be routered/planed to create a recess joint similar to the long factory-formed tapered edges. This eliminates the recess-forming hassles of traditional plasterboard, or raised surface joints. Apply Sheetrock® Durabond™, Easy Sand™ or USG Boral Back-Blocking Adhesive with a 6mm notched spreader to form beads over the entire face of the back-block strip, at right angles to the joint. (Note: screw fixing during sheet installation will provide additional crack resistance.)
EXTERNAL CEILINGS

Skillion Roofs

Due to the high temperatures (maximum temperature 52°C) and low air flow that can occur in the confined space of a skillion roof, some special attention must be paid to detail in these areas, as described below. Ignoring these details can result in severe movement in the framing being transferred to the USG Boral Fiberock® linings surface.

- Timber framing in skillion roof situations must comply with NZBC roof ventilation and NZS 3604:2011 requirements.
- Timber framing moisture content must be below 18% at the time of lining.
- No vapour barrier is to be used between the back of the USG Boral Fiberock® lining and the underside of the roofing material unless:
  - the building is in a very cold environment (e.g. ski lodge)
  - over a spa pool room or indoor swimming pool (USG Boral Fiberock® interior linings are not generally suitable for this application)
  - over a space in which wet industrial activity takes place (USG Boral Fiberock® interior linings are not generally suitable for this application).

These applications require specific moisture and thermal design.

Figure 44: Skillion roof constructions
JOINTING & FINISHING

Interior Linings

3-Coat System
Embed Sheetrock® paper joint tape in USG Boral BaseCote setting-type joint compound and wipe with a joint knife, leaving a thin coating of joint compound over all joints and interior angles. Complete to the level of finish specified in project requirements with Sheetrock® Total ready-mix compound.

For a Level 5 finish, applying Sheetrock® Tuff-Hide® is recommended prior to painting.

| TABLE 14: USG BORAL LINING JOINT SYSTEM |
|---|---|---|
| 1 - BASE COMPOUND | 2 - 2ND COAT | 3 - TOP COAT |
| BaseCote setting-type compound 40/60/90 | BaseCote setting-type compound 40/60/90 | Sheetrock® Total Finishing Compound (Black Lid) |

Application:

- **1st Coat** – Apply a thin coat of BaseCote over the joint. Embed paper tape onto the BaseCote, then apply a skim coat of BaseCote over the paper tape. Ensure the finish level is flush or slightly under flush for recessed joints. For butt joints, ensure the skim coat is as smooth as practicable – BaseCote sets very hard and is difficult to sand.
  1. Recess joint – 150mm min width (AS/NZS 2589:2017)
  2. Butt Joint1 – 300mm min width (AS/NZS 2589:2017)
  3. Scrape back while still “green” (within 24 hours). Finish off with a machine sander equipped with 150–180 grit paper.

- **2nd Coat** – apply BaseCote.
  1. Recess joint – 200mm min width (AS/NZS 2589:2017)
  2. Butt Joint1 – 400mm min width (AS/NZS 2589:2017)
  3. Scrape back while still “green” (within 24 hours). Finish off with a machine sander equipped with 150–180 grit paper.

- **3rd Coat** – Apply Sheetrock® Total, allowing to dry thoroughly, subject to season temperatures and humidity.
  1. Recess joint – 250mm min width (AS/NZS 2589:2017)
  2. Butt Joint1 – 500mm min width (AS/NZS 2589:2017)
  3. Lightly sand back as required with 220 grit maximum to achieve a smooth finish.

- **Painting** – Roll apply (not spray) a good-quality sealer coat and 2 x finishing top coats suitable for interior conditions in accordance with the paint manufacturer’s requirements (see page 37).

1 Fiberock® butt joints can be hand-planed to create a recessed joint for a superior joint finish. If scoring and snapping Fiberock® for part sheets, use a hand rasp to make the snapped edge a clean butt finish. Treat as above for butt joints.
JOINTING & FINISHING

Exterior Soffits

Exterior Soffit Areas – 3-coat system
Embed Sheetrock® paper joint tape in Sheetrock® Durabond™ setting-type joint compound and wipe with a joint knife, leaving a thin coating of joint compound over all joints and interior angles. Complete to the level of finish specified in the project requirements with Sheetrock® Total ready-mix compound.

Application:
• **Recess Joint** – Apply a coat of Durabond to recess (150mm min width for recessed joint) (AS/NZS 2589:2017 Gypsum linings – application and finishing).
  1. **Butt Joint** – Apply a thin coat of Durabond over the joint to approximately 300mm width (AS/NZS 2589:2017).
  2. Embed paper tape onto the Durabond, then apply a skim coat of Durabond over the paper tape.
  3. Ensure the finish level is flush or slightly under flush for recessed joints. For butt joints, ensure the skim coat is as smooth as practicable (as Durabond sets very hard and is difficult to sand).
  4. Once set, scrape back while still “green” (within 24 hours).

• **2nd Coat** – Apply Sheetrock® Total, allowing to dry thoroughly, subject to season temperatures and humidity (200mm min width for recessed joint, 400mm min for butt joint) (AS/NZS 2589:2017).
  1. **Scrape** if required and lightly sand back with 150–220 grit.
  2. **Apply a top coat of Sheetrock® Total**, allowing to dry thoroughly, subject to season temperatures and humidity (250mm min width for recessed joint, 500mm min for butt joint) (AS/NZS 2589:2017).
  3. **Lightly sand back** as required with 220 grit maximum to achieve smooth finish.

• **Painting** – Roll apply (not spray) a good-quality sealer coat and 2 x finishing top coats suitable for exterior conditions in accordance with the paint manufacturer’s requirements (see page 37).

1 Fiberock® butt joints can be hand-planed to create a recessed joint for superior soffit joint finish. If scoring and snapping Fiberock® for part sheets, use a hand rasp to make the snapped edge a clean butt finish. Treat as above for butt joints.
PAINTING

All Fiberock® linings must be sealed with primer and can only be rolled, not sprayed. Two final colour coats are recommended to finish the sheet.

Internal Walls & Ceilings

(Low Sheen or Matt finish)

1st Coat — High quality* Specific Plasterboard sealer-coat – must be roll applied ONLY (spray application is not permitted).

2nd Coat — High quality* Acrylic paint system (water based is preferred but mineral based will achieve a Level 4 finish).

3rd Coat — High quality* Acrylic paint system (water based is preferred but mineral based will achieve a Level 4 finish).

Bathrooms & Wet Areas

(Semi Gloss or Low Sheen)

1st Coat — High quality* Specific Plasterboard sealer-coat for bathrooms – must be roll applied ONLY (spray application is not permitted).

2nd Coat — High quality* Acrylic paint system for bathrooms (water based is preferred but mineral based will achieve a Level 4 finish).

3rd Coat — High quality* Acrylic paint system for bathrooms (water based is preferred but mineral based will achieve a Level 4 finish).

Soffits, Covered Balcony & Alfresco Areas

(Semi Gloss or Low Sheen)

1st Coat — High quality* Specific Plasterboard sealer coat for bathrooms – must be roll applied ONLY (spray application is not permitted).

2nd Coat — High quality* Acrylic paint system for exterior cladding (water based is preferred but mineral based will achieve a Level 4 finish).

3rd Coat — High quality* Acrylic paint system for exterior cladding (water based is preferred but mineral based will achieve a Level 4 finish).

Dilutions of water-based paint product is not acceptable.

* e.g. Nippon, Resene, Dulux & PPG
WET AREA SYSTEMS

General Notes

Fiberock® is a water-resistant paperless gypsum fibre board lining offering additional benefits of mould resistance and high impact resistance. Fiberock® contains 95% recycled materials.

Manufactured with recessed edges for flush jointing, Fiberock® can be used as an alternative wall lining in USG Boral Wet Areas and can be installed using the same fixing, jointing and waterproofing materials as specified for USG Boral Multistop™.

USG Boral Wet Area Systems are for the interior lining of timber- and steel-framed walls and ceilings in wet areas such as bathrooms, showers, laundries, sanitary compartments and kitchens, where a water-resistant lining material is desirable.

Wet areas can be classified into two categories:

1. Splash areas — those areas that may be subject to water splash e.g. behind hand basins, laundry tubs and bath surrounds.
2. Shower spray areas — areas subject to spray from the shower rose, which includes enclosed or unenclosed showers, and showers over baths.

USG Boral Wet Area Systems are for use as a wet area wall and ceiling lining in buildings within the following scope:

- on framed walls and ceilings within the scope and limitations of NZS 3604:2011; or,
- on timber and light-gauge steel-framed walls and ceilings subject to a specific design; and
- for interior use only.

USG Boral Wet Area Systems comprise materials and installation details outlined in this manual and must be installed in accordance with the USG Boral specifications to achieve the required performance system applications.

USG Boral Wet Area Systems comply with the requirements of E3/AS1 and are thus suitable for use in residential buildings and other buildings with a similar usage pattern. Excluding Steam rooms and Saunas.

When used in shower areas, the Fiberock® must be protected by a suitable waterproof membrane. Refer to the Code of Practice for Internal Wet Area Membranes for details on the selection, design and installation of waterproofing membrane systems.

Preparation of Wet Areas

- Check framing for the layout and fixing of additional noggings to support wet area fittings such as screens and taps.
- Provide adequate noggings 25mm (nominal) for continuous support of bath rims, shower bases, tubs and sinks, for fixing the edges of Fiberock® linings.
- Ensure that plumbing pipes and noggings do not protrude beyond the face of the studs.
- Preformed shower bases and baths are to be recessed into the studs so that USG Boral Fiberock® linings can sit correctly in front of the shower base upstand. This will provide a natural flashing point.
- The installation requirements for Fiberock® varies depending on the final surface finish. Tiled walls require additional fixings to support the weight of the tiles. Refer to Figure 46 for fixing requirements.
- Bracing sheets are permitted in general wet areas, but are not permitted for use behind showers and baths.
Fiberock® linings are suitable as substrates for wet areas, including tiled areas. These sheets must be screw fixed only — adhesive fixing is not permitted. For further information on tiling refer to the latest edition of the BRANZ Good Practice Guide – Tiling, and Tiled Area as well as the details on page 43 of this manual.

- Sheets can be fixed horizontally or vertically with the bottom edge 6-10mm clear of the finished floor level or fixture.
- Lining sheets are best run the full length or height of the wall to avoid butt joints.
- Fix 40mm x 40mm corner support metal angles (AS/NZS 2589:2017), leaving a 6mm gap at the bottom.
- Ensure sheets sit flat and firm against the framing while driving fasteners.
- Screws should be slightly overdriven but should not break the face surface.
- Neatly cut out penetrations and holes using a hole saw and allowing an approx 6mm gap for sealant.
- Fasteners to be placed min 18mm from sheet ends and cut edges and 12mm from sheet edges. Screws should be selected from Tables 9 and 10.
- Walls in wet areas can be finished with a variety of finishes such as tiles, paints, pre-formed shower liners and sheet vinyl. Areas subject to spray from the shower rose must be waterproofed with an appropriate waterproofing membrane. Shower spray areas include enclosed or unenclosed showers, and showers over baths.

**Framing**

Timber framing must be in accordance with NZS 3604:2011, or a specific design to NZS 3603 and AS/NZS 1170. Steel framing must be to a specific engineering design meeting the requirements of the NZBC. Studs must be at maximum 600mm centres.

To achieve an acceptable decorative finish on timber framing, the walls must not be lined unless the core moisture content of the timber framing is less than 18%. USG Boral Building Products NZ recommend a moisture content of 8-12% where buildings are to be air conditioned or centrally heated.

**Control Joints**

In tiled areas, control joints must be provided at maximum 4m centres.

**Internal Corners**

Internal corners in tiled areas must be reinforced with a 40mm x 40mm galvanised steel angle Rondo F40 prior to fixing the Fiberock® linings.

---

**Figure 45: Internal corner**
INSTALLATION

Ceilings

Although the NZBC does not require the use of water-resistant ceiling linings over wet areas, Fiberock® can be used in wet area ceilings if water-resistant linings are desirable.

Fiberock® is to be fixed with the screws only fixing method.

NOTE: USG Boral recommends that ceiling paint in wet areas should be specified as suitable for wet areas by the paint supplier. Please ensure the sealer coat is back rolled, not spray applied. Please see separate instructions when Sheetrock® Tuff-Hide™ Primer-Surfacer is used.

Ceiling Fixing Spans

The maximum fixing spans for ceilings used in wet areas are as indicated in the following table.

<table>
<thead>
<tr>
<th>TABLE 16: MAXIMUM SPANS FOR INTERNAL CEILINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>THICKNESS</td>
</tr>
<tr>
<td>13/16mm Fiberock®</td>
</tr>
</tbody>
</table>

Fasteners

Refer to fixing details on page 14 and page 41 for tiled areas.

Wet Area Sealants

A wet area sealant is a flexible acrylic sealant suitable for waterproofing the following:

- wall junctions and cutouts
- bottom of sheets in shower bases or bath abutments
- around plumbing fixtures and penetrations.

The selected wet area sealant must comply with the requirements of AS 3740 for waterproof materials.
**Tiled Areas**

In addition to the general installation guidelines, the following points are specific to wet and tiled areas:

- Fiberock® in tiled areas must be fixed using a full fastener system. Adhesive is not permitted.
- Space fasteners as per Table 17 and Figure 46.
- Neatly cut out penetrations and holes using a hole saw and allowing an approx 6mm gap for sealant.
- Fix 40mm x 40mm corner support angles where required leaving a 6mm gap at the bottom.

**TABLE 17: FASTENER SPACING IN TILED AREAS** (studs at 600mm ctrs max)

<table>
<thead>
<tr>
<th>WALL TILES WEIGHT (INCLUDING TILE ADHESIVE)</th>
<th>MAX FASTENER SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INTERMEDIATE STUDS</td>
</tr>
<tr>
<td></td>
<td>SHEET ENDS</td>
</tr>
<tr>
<td>No greater than 12kg/m²</td>
<td>200mm</td>
</tr>
<tr>
<td></td>
<td>150mm</td>
</tr>
<tr>
<td>Greater than 12kg/m² and up to 32kg/m²</td>
<td>100mm</td>
</tr>
<tr>
<td></td>
<td>100mm</td>
</tr>
<tr>
<td>Greater than 32kg/m² and up to 50kg/m² max</td>
<td>100mm</td>
</tr>
<tr>
<td>(13/16mm Fiberock® only)</td>
<td>100mm</td>
</tr>
</tbody>
</table>

Tiles up to 12kg/m²

Tiles greater than 12kg/m² up to 32/50*kg/m² max

Tiles up to 12kg/m²

Tiles greater than 12kg/m² up to 32/50*kg/m² max

*Tiles greater than 12kg/m² and up to 32/50*kg/m² max

150mm ctrs max at sheet ends

200mm ctrs max at intermediate studs

Tiles no greater than 12kg/m²

100mm ctrs max at intermediate studs

Tiles greater than 12kg/m² and up to 50kg/m² max

*Fiberock® 13/16mm only

**Figure 46: Fiberock® fixing in tiled areas**

**Tile Weights**

USG Boral Fiberock® is a suitable substrate for tiling. These sheets must be screw fixed only when tiles are to be applied - adhesive fixing is not permitted. The maximum weight of tiling for each sheet is as follows:

- 10mm Fiberock® — 32kg/m²
- 13mm or 16 mm Fiberock® — 50kg/m²
- Ceramic and porcelain wall tiles typically have a mass less than 20kg/m².

For further information on tiling, refer to the latest edition of the BRANZ Good Practice Guide – Tiling.
INSTALLATION

Minimum waterproofing and water-resistance requirements for walls and floors in wet areas are outlined in NZBC Acceptable Solution E3/AS1.

Waterproofing Membranes

The Code of Practice for Internal Wet Area Membranes (selection, design, installation), published by the Waterproofing Membrane Association (NZ) Incorporation, sets out the selection of waterproofing membranes, general design principles and acceptable substrates.

Waterproofing membranes complying with AS/NZS 4858 are deemed to be a waterproof material when used as part of the waterproofing systems as outlined in E3/AS1. A bond breaker must be installed at all wall/floor, hob/wall junctions and at movement joints where the waterproofing membrane is bonded to the substrate. Refer to the Code of Practice for Internal Wet Area Membranes for details regarding the selection, design and installation of waterproofing membrane systems. Always refer to the manufacturer’s recommendations before applying waterproof membranes. Fiberock® is manufactured in accordance with ASTM C1278 and meets the water-resistance and surface-water-absorption requirements of that standard.

Waterproofing of Joints & Junctions within Wet Areas

Joints and junctions within wet areas must be waterproofed prior to installation of tiling or other approved surface materials.

Cut edges of gypsum linings at wall-floor junctions, preformed shower bases and over-bath lip must be protected by sealing with a wet area sealant.

Waterproofing Wall Junctions

Waterproof sheet edges above baths, shower bases, laundry tubs, etc. by sealing with wet area sealant for the full depth of the board (see Figure 47).

Waterproof floor and wall junctions by sealing with wet area sealant for the full depth of the board (see Figure 48).

Figure 47: Seal sheet edges over baths, shower bases, laundry tubs

Figure 48: Seal floor and wall junctions
Jointing in Wet Areas

USG Boral recommends that Fiberock® linings in tiled areas should be jointed using USG Boral chemical setting compounds such as Sheetrock® Easy Sand™ or BaseCote™ and paper tape.

With a broad knife, evenly fill joint recesses with USG Boral chemical setting compound and also apply to both sides of internal and external corners.

Centre reinforcement paper tape over joints, internal and external corners and firmly bed into the USG Boral setting compound, ensuring there are no trapped air bubbles.

When the tape is embedded, immediately apply a skim coat of USG Boral chemical setting compound with a broad knife, ensuring the tape is completely covered, with no tape curling at the edges.

Cover fastener heads with a skim coat of USG Boral chemical setting compounds such as Sheetrock® Easy Sand™ or BaseCote™.

After the final setting compound has dried (min 48 hours), apply a waterproofing membrane that complies with AS/NZS 4858 to the whole face of wet area walls, as per Figures 49-51, in accordance with the Code of Practice for Internal Wet Area Membranes.

Notes: USG Boral base compounds can be used if a waterproofing membrane installed by a specialist contractor and complying with the requirements of AS/NZS 4858 Wet area membranes is applied over the whole face of wet area walls.
INSTALLATION

Rigid Acrylic Shower Linings

Where rigid acrylic shower linings are to be installed, the Fiberock® must not be jointed, pre-sealed or painted and must be free of dust prior to the installation of the lining. This is to ensure good adhesion of the shower lining to the surface of the wet area lining. Installation of acrylic shower linings should be carried out as per the installation and specifications of the manufacturer/supplier.

Waterproofing of Penetrations

Use a hole saw to make penetrations for taps, shower nozzles and the like. Waterproof the cut edges of the linings at penetrations by sealing with a wet area sealant for the full thickness of the board (see Figure 50). Alternatively, plumbing penetrations can be waterproofed with proprietary waterproofing components (see Figure 51).

For the treatment of fastener penetrations, refer to the Code of Practice for Internal Wet Area Membranes.

<table>
<thead>
<tr>
<th>Waterproof membrane</th>
<th>6-10mm wet area sealant</th>
<th>Fiberock® lining</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Figure 50: Plumbing penetrations - sealed](image)

<table>
<thead>
<tr>
<th>Proprietary waterproofing flange</th>
<th>Fiberock® lining</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Figure 51: Plumbing penetrations with proprietary waterproofing components](image)
BRACING SYSTEMS

Wall-Bracing Systems
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WALL-BRACING SYSTEMS

Fiberock® is used in multiple BRANZ-appraised braced wall and ceiling diaphragm systems. For full system details, refer to USG Boral’s Brace+ Plasterboard Bracing Manual.

### TABLE 18: USG BORAL FIBEROCK® WALL-BRACING SYSTEMS

<table>
<thead>
<tr>
<th>Bracing System Reference</th>
<th>System Description</th>
<th>Board Type</th>
<th>Hold-downs</th>
<th>Min Wall Length (m)</th>
<th>Max Wall Length (m)</th>
<th>Wind Value (BU/m)</th>
<th>Earthquake Value (BU/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB1FR (see Figure 52)</td>
<td>10, 13, 16mm Fiberock® on one side, with hold-downs</td>
<td>Fiberock®</td>
<td>Yes</td>
<td>0.4</td>
<td>1.2</td>
<td>105</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2</td>
<td>1.2</td>
<td>145</td>
<td>140</td>
</tr>
<tr>
<td>UB2FR (see Figure 53)</td>
<td>10, 13, 16mm Fiberock® on both sides, with hold-downs</td>
<td>Fiberock®</td>
<td>Yes</td>
<td>0.4</td>
<td>1.2</td>
<td>115</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2</td>
<td>2.4</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>UBFRP (see Figure 54)</td>
<td>10, 13, 16mm Fiberock® on one side &amp; 7mm DD structural plywood on the other side, with hold-downs</td>
<td>Fiberock® &amp; Plywood</td>
<td>Yes</td>
<td>0.4</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Notes:
1. Maximum hold-down rating for NZS 3604:2011 timber floors is 120BU/m.
2. Maximum hold-down rating for NZS 3604:2011 concrete floors is 150BU/m.
3. Where wind and earthquake values exceed the floor ratings (see items 1 & 2 above), ratings must be reduced to the required maximum permitted ratings for timber or concrete floors.
4. Fiberock® sheets must be installed vertical orientation only.
5. Refer to Plasterboard Allowable Substitution Table, Table 20, page 49.

Refer to the USG Boral Brace+ software calculator to calculate the wind and earthquake demand requirements and to calculate the achieved values using the USG Boral Bracings Systems detailed within this manual. Please register at usgboral.com, Resources & Tools.

### TABLE 19: USG BORAL SYSTEM UB1FR, UB2FR & UBFRP – SPECIFICATIONS

<table>
<thead>
<tr>
<th>USG Boral lining type</th>
<th>The following USG Boral lining is permitted for use with the USG Boral UB1FR, UB2FR and UBFRP bracing systems.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 10mm, 13mm and 16mm Fiberock®</td>
</tr>
</tbody>
</table>

**Fasteners**

- Coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. For corner-fixing details refer to Figure 56.
- Use 6g x 32mm coarse-threaded screws for 10mm
- Use 6g x 41mm coarse-threaded screws for 13mm
- Use 7g x 51mm coarse-threaded screws for 16mm

**Hold-down anchors (minimum 15kN characteristic uplift strength)**

Concrete floors: Install masonry anchors (minimum 15kN characteristic uplift strength) with 50 x 50 x 3mm washers or J bolts set into the concrete at a minimum depth of 75mm.

Timber floors: Install M12 x 200mm galvanised coach screws with 50 x 50 x 3mm washer. (Ensure bolts are secured into solid blocking.)

**Hold-down brackets or straps**

Install either hold-down brackets or 400 x 25 x 0.9mm galvanised or stainless steel straps.

**Adhesive**

It is not permitted to use adhesive to replace fasteners.

**Framing**

Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of S8. Maximum stud centres 600mm.

**Jointing plaster**

USG Boral range or suitable drywall plaster compounds are to be applied to all joints and fastener heads within the bracing element. Application of the paper tape and plaster compounds is to be in accordance with the current AS/NZS 2589:2017. Minimum plaster joint finish is to be Level 4.

**Minimum wall length**

The minimum permitted wall length for Fiberock® bracing systems must not be less than 400mm.

**Maximum wall length**

- The maximum permitted wall length of the UB1FR bracing system must not exceed 4800mm.
- The maximum permitted wall length of the UB2FR and UBFRP bracing system must not exceed 2400mm.

**Wall height other than 2.4m**

Wall heights as determined by the current NZS 3604:2011. Use the following formula for wall heights exceeding 2.4m:

\[
\text{Adjusted rating} = \left( \frac{\text{Actual wall height}}{2.4m} \right) \times \text{the bracing value}
\]
UB1FR

See Figure 55 for corner-fixing details

Sheets to be fixed to the framing with the required fasteners (refer Table 19) at 150mm centres

Screws at 300mm centres for intermediate studs

Hold-down to be positioned at each end of the USG Boral bracing element

10, 13 or 16mm Fiberock® installed on one side of the bracing element

Using the required fasteners (refer Table 19) fix at 150mm centres to the perimeter of the bracing element

UB2FR

See Figure 55 for corner-fixing details

Sheets to be fixed to the framing with the required fasteners (refer Table 19) at 150mm centres

Screws at 300mm centres for intermediate studs

10, 13 or 16mm Fiberock® installed on one side of the bracing element

Using the required fasteners (refer Table 19) fix at 150mm centres to the perimeter of the bracing element

Figure 52: UB1FR bracing system with sheets installed vertically — 2.4m-long bracing element detailed

Figure 53: UB2FR bracing system with sheets installed vertically — 2.4m-long bracing element detailed
**WALL-BRACING SYSTEMS**

**UBFRP**

Sheets to be fixed to the framing with the required fasteners (refer Table 19) at 150mm centres

Screws at 300mm centres for intermediate studs

7mm DD structural plywood fixed at 150mm centres to the perimeter of the bracing element and fixed at 300mm centres to the intermediate studs, using 50mm x 2.8mm galvanised clouts

10, 13 or 16mm Fiberock® installed on one side of the bracing element

Using the required fasteners (refer Table 19) fix at 150mm centres to the perimeter of the bracing element

Hold-down to be positioned at each end

See Figure 55 for corner-fixing details

**Corner-Fixing Pattern**

**Corner Fastener Centres are**

A = 50mm  
B = 100mm  
C = 150mm  
D = 75mm

The remainder of perimeter fastener centres = 150mm.

Fasteners to be placed not less than 18mm from sheet ends and cut edges, and not less than 12mm from sheet edges.

Galvanised clouts to be placed not less than 7mm from plywood sheet edges.

Figure 54: UBFRP bracing system with sheets installed vertically — 2.4m-long bracing element detailed

Figure 55: Fiberock® corner-fixing pattern for each corner
Renovation & Refurbishment

With any renovation involving the removal of the interior linings of existing dwellings, it is important to ensure that the bracing elements are correctly reinstated as per the original design.

Plasterboard Allowable Substitutions

**TABLE 20: USG BORAL PLASTERBOARD ALLOWABLE SUBSTITUTIONS**

<table>
<thead>
<tr>
<th>USG Boral Bracing PlasterBoard</th>
<th>Fiberock®</th>
<th>Firestop®</th>
<th>Soundstop™</th>
<th>Multistop™ 2 or 4</th>
<th>Sheetrock®</th>
</tr>
</thead>
<tbody>
<tr>
<td>10mm SHEETROCK®</td>
<td>✔️ 1️⃣</td>
<td>✔️ 2️⃣</td>
<td>✔️ 1️⃣</td>
<td>✔️ 1️⃣</td>
<td>✔️ 1️⃣</td>
</tr>
<tr>
<td>10mm MULTISTOP™ 2 or 4</td>
<td>✔️ 1️⃣</td>
<td>✔️ 2️⃣</td>
<td>✔️ 1️⃣</td>
<td>✔️ 1️⃣</td>
<td>✔️ 1️⃣</td>
</tr>
<tr>
<td>10mm FIBEROCK®</td>
<td>✔️ 1️⃣</td>
<td>✔️ 2️⃣</td>
<td>✔️ 1️⃣</td>
<td>✔️ 1️⃣</td>
<td>✔️ 1️⃣</td>
</tr>
</tbody>
</table>

1 Use 6g x 41 screws  2 Use 7g x 51 screws

Penetrations In Bracing Elements

The following penetrations are permitted within the field of all USG Boral Bracing Element systems:

- **Socket outlets** – 90 x 90mm (maximum) socket outlet penetrations are to be positioned not less than 90mm from the perimeter of the bracing element.

- **Switch outlets** – 90 x 90mm (maximum) switch outlet penetrations are to be positioned not less than 90mm from the perimeter of the bracing element.

- **Penetration holes** – 125mmØ (maximum) hole penetrations are to be positioned not less than 300mm from the perimeter of the bracing element.

- **Downlights** – 100mmØ (max). Downlights are to be positioned no less than 1.0m apart and not closer than 1.0m from the perimeter of the ceiling diaphragm. Refer Figure 58.

For larger penetrations within bracing elements, seek professional advice on Specific Engineering Design (SED) or contact USG Boral.
WALL-BRACING SYSTEMS

Wall-Bracing Hold-Down Construction Details

The USG Boral bracing hold-down construction details described in this section are required for USG Boral Bracing Systems UB1FR, UB2FR, UBFRP.

### TABLE 21: COMPONENT DESCRIPTION

<table>
<thead>
<tr>
<th>Component Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masonry hold-down anchor (minimum 15kN characteristic uplift strength)</td>
</tr>
<tr>
<td>50 x 50 x 3.0mm galvanised washer</td>
</tr>
<tr>
<td>400 x 25 x 0.9mm galvanised or stainless steel strap</td>
</tr>
<tr>
<td>30 x 2.5mm galvanised flat head nails. Install 6 nails to each side of the stud and 3 nails to each side of the bottom plate</td>
</tr>
<tr>
<td>Pryda Bracing Anchor bracket can be used to replace the strap</td>
</tr>
</tbody>
</table>

Install 400 x 25 x 0.9mm strap underneath bottom plate and on either side of stud, using 30 x 2.5mm galvanised flat head nails, 6 on each side of the stud and 3 on each side of the bottom plate.

Install masonry anchor (minimum 15kN characteristic uplift strength) or J bolt set 75mm into concrete 80mm from outside of stud to the centre of the hold-down bolt.

400 x 25 x 0.9mm galvanised strap installed under the bottom plate. Use 30 x 2.5mm galvanised flat head nails to secure the strap, 6 on each side of stud and 3 on each side of the bottom plate.

Install masonry anchor (minimum 15kN characteristic uplift strength) or J bolt set 75mm into concrete 80mm from outside of stud to the centre of the hold-down bolt.

**Figure 59:** Internal wall on concrete floor — detailed with strap

**Figure 60:** External wall on concrete floor — detailed with strap
Wall-Bracing Hold-Down Construction Details

Figure 61: Internal wall on concrete floor — detailed with the Pryda bracing anchor bracket

Install masonry anchor (minimum 15kN characteristic uplift strength) or J bolt set 75mm into concrete

Figure 62: External wall on concrete floor — detailed with the Pryda bracing anchor bracket

Pryda bracing anchor bracket installed to the centre of the framing

Concrete flooring

USG Boral lining

Exterior cladding

Concrete flooring

Bottom plate

Pryda bracing anchor bracket must be on the inside face of the framing

Install masonry anchor (minimum 15kN characteristic uplift strength) or J bolt set 75mm into concrete
WALL-BRACING SYSTEMS

Wall-Bracing Hold-Down Construction Details

The Pryda bracing anchor has been developed for both timber and concrete floor connections (timber floor shown above). Hold-down straps are not required when using the Pryda bracing anchor system. Each bracing element requires 2 Pryda bracing anchor brackets and 14 screws (7 screws per anchor). The Pryda bracing anchor brackets are supplied as pairs, including 14 screws.
Wall-Bracing Hold-Down Construction Details

Install 400 x 25 x 0.9mm strap underneath bottom plate and on either side of stud using 30 x 2.5mm galvanised flat head nails, 6 on each side of stud and 3 on each side of bottom plate 80mm from outside of stud to the centre of the hold-down bolt.

Install M12 galvanised coach screw into solid timber floor sub-framing. Minimum thread length to be not less than 145mm.

Figure 65: Internal wall on timber floor — detailed with strap

Figure 66: External wall on timber floor — detailed with strap

Timber flooring

80mm from outside of stud to the centre of the hold-down bolt

Install 50 x 50 x 3.0mm washer

Install M12 galvanised coach screw into solid timber floor sub-framing. Minimum thread length to be not less than 145mm.

Joint constructed over the stud

Secure the secondary and primary studs together with 75 x 3.75mm nails at 300mm centres along the full height of the studs.

Install 400 x 25 x 0.9mm galvanised connection strap. A 3kN connection strap requires 3 of 30 x 2.5mm galvanised nails on either side of the joint. A 6kN connection strap requires 6 of 30 x 2.5mm galvanised nails on either side of the joint.

The installation of all top plate connections for bracing elements must be in accordance with NZS 3604:2011 Section 8.7.3. Joints must be made over blocking or studs with a 6kN connection if the bracing values are greater than 100 BUs. If the rating is less than 100 BUs, a 3kN connection strap can be used.

Figure 67: External wall on timber floor — detailed with double studs and double straps

Figure 68: Top plate connections in bracing elements
CEILING DIAPHRAGMS

Fiberock® is BRANZ-appraised for bracing ceiling diaphragms. For full system details refer to USG Boral’s Brace+ Plasterboard Bracing Manual.

Installation Instructions

Ceiling diaphragms are horizontal bracing elements designed to distribute lateral loads to the bracing walls. Ceiling diaphragms are required where the distance between the bracing walls is greater than 5m with a single top plate or 6m with two top plates.

Construction of the ceiling diaphragm must be in accordance with NZS 3604:2011, Sections 5.6 and 13.5, as well as the instructions detailed within this document.

As per NZS 3604:2011, a ceiling diaphragm shall be square or rectangular in shape and the ratio of length to width must be less than two.

Protrusions from ceiling diaphragms are permitted but cut-outs within ceiling diaphragms are not permitted.

The ceiling diaphragm must have fixings positioned at 150mm centres to its perimeter and 300mm centres to intermediate battens. Fixings are to be no less than 12mm from the sheet edge.

The minimum sheet size permitted is to be no less than 1800mm x 900mm.

Refer to ceiling diaphragm corner-fixing details on page 58.

The entire area of the ceiling diaphragm must be covered with Fiberock®. The installation of the Fiberock® is to be carried out as described on pages 24–30 and page 57 of this manual.

Minimum Fiberock® Fastener Types Permitted

The information detailed within this table is in accordance with NZS 3604:2011 and is applicable for single- and two-level timber-framed structures.

<table>
<thead>
<tr>
<th>TABLE 23: CEILING DIAPHRAGM PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>USG Boral Lining Type</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Fiberock®</td>
</tr>
</tbody>
</table>

*nominal weight.

Ceiling diaphragms must be directly connected to bracing lines that have a capacity of not less than 15 BU/m and shall meet the requirements of NZS 3601:2011 Section 5.6.2. This table details the minimum fasteners required for installing USG Boral Fiberock® sheets as ceiling diaphragms.

<table>
<thead>
<tr>
<th>TABLE 24: PLASTERBOARD FASTENERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>USG Boral Lining Type</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Fiberock®</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

It is not permitted to use nails or adhesive to replace fasteners. Where a second layer is to be installed, the first layer is to be installed as the ceiling diaphragm.
Ceiling Diaphragm Construction Details

Timber ceiling-batten wall connection – use continuous 150 x 35mm ribbon plate

For ceiling diaphragm installations that use steel battens and direct fix brackets, a solid fixing at a maximum 600mm centres to the floor or ceiling framing is required. Refer to the following construction details.

**Timber support blocking components**
- FDFS – Direct fix bracket
- FDFL – Direct fix bracket
- F37 – Ceiling batten

**Install F24 perimeter channel using**
- 8g 12 x 25mm wafer head screws

**Install 10g x 30mm drill-point wafer head screws suitable for timber to each side of the steel batten**

**Install steel ceiling battens to suit lining at a maximum of 600mm centres**

**Additional timber support blocking**
- 8g 12 x 25mm wafer head screw or 30mm clout (3 minimum)
- 4 x 75mm x 3.15mm nails

**Install additional timber support of a minimum length of 300mm to the primary timber support with**
- 4 x 75mm x 3.15mm nails

**Install FDFS brackets using**
- 8g 12 x 25mm wafer head screw or 30mm clout (3 minimum)

**Primary timber support**

---

**Figure 69:** Ceiling diaphragm/wall connection construction with timber batten

**Figure 70:** Direct fix bracket installation for ceiling diaphragms

**Figure 71:** Ceiling diaphragm wall connection with steel batten
- F24 – Perimeter channel
- F37 – Ceiling batten

**Figure 72:** Steel support blocking
Ceiling Diaphragm Corner-Fixing Details

Corner Fastener Centres are
A = 50mm
B = 150mm
C = 150mm

The remainder of perimeter fastener centres = 150mm
Fasteners to be placed at 300mm centres within the field of the ceiling diaphragm.
Fasteners to be placed not less than 18mm from sheet ends and not less than 12mm from sheet edges.

Figure 73: Fiberock® diaphragm corner-fixing pattern
## FIRE & ACOUSTIC SYSTEMS

### Fire & Acoustic Systems
- 58 Steel-Stud Wall Systems
- 58 Timber-Stud Wall Systems
- 58 Partiwall Wall Systems
- 58 IntRwall Wall Systems

### Quick Selection Tables
- 59 Single Steel-Stud Walls Lined One Sides
- 59 Single Steel-Stud Walls Lined Both Sides
- 60 Quiet Stud Walls
- 60 Staggered Steel-Stud Walls
- 61 Twin Steel-Stud Walls
- 61 Timber-Stud Walls Lined One Side
- 62 Timber-Stud Walls Lined Both Sides
- 62 Furred Walls
- 63 Staggered Timber-Stud Walls
- 63 Twin Timber-Stud Walls
FIRE & ACOUSTIC SYSTEMS

Fibrocks® has been subjected to full scale fire testing at Exova Warrington, BRANZ and CSIRO and satisfies AS 1530.4 Fire resistance test for elements of construction. Fibrocks® also complies with AS/NZS 5601.1:2013 Appendix C, making 13mm and 16mm a suitable backing for splash backs in gas cooking environments. Fibrocks® has not been tested for fire rated ceiling applications.

Refer to the following Quick Selection Tables for a summary of FRR and acoustic (Rw & STC) performance details. The range of acoustic values shown depend on the presence and type of insulation used in the wall system. Refer to USG Boral Systems+ NZ manual for a more comprehensive list of system details and insulation options.

Steel-Stud Wall Systems

Timber-Stud Wall Systems

Partiwall Wall Systems

IntRwall Wall Systems

NOTE: Refer to respective Installation Manuals for system options.
### TABLE 25: SINGLE STEEL-STUD WALLS LINED ONE SIDE

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>LINING SIDE 1</th>
<th>LINING SIDE 2</th>
<th>STUD SIZE mm</th>
<th>ANY STUD</th>
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<td></td>
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<td>30 30</td>
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<td>2x16mm FIBEROCK®</td>
<td>NA</td>
<td>60/60/60</td>
<td>36 35</td>
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<td>SOF90.1</td>
<td>3x16mm FIBEROCK®</td>
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<td>90/90/90</td>
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### TABLE 26: SINGLE STEEL-STUD WALLS LINED BOTH SIDES

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<th>150</th>
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<td>R&lt;sub&gt;w&lt;/sub&gt;</td>
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<td>1x13mm FIBEROCK®</td>
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<td>39–42</td>
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<td>41–48</td>
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<td>-</td>
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September 2020 USG Boral New Zealand
### TABLE 27: QUIET STUD WALLS

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<th>LINING SIDE 1</th>
<th>LINING SIDE 2</th>
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<th>FRR</th>
<th>R_w</th>
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<td>2x13mm FIBEROCK®</td>
<td>~/30/30</td>
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<td>1x16mm FIBEROCK®</td>
<td>~/60/60</td>
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<td>2x13mm FIBEROCK®</td>
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<td>2x16mm FIBEROCK®</td>
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<td>50-60</td>
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### TABLE 28: STAGGERED STEEL-STUD WALLS

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<td>2x13mm FIBEROCK®</td>
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<td>1x16mm FIBEROCK®</td>
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<td>~/90/90</td>
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<td>~/120/120</td>
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### TABLE 29: TWIN STEEL-STUD WALLS

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<th>LINING SIDE 2</th>
<th>STUD SIZE mm</th>
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<th>75</th>
<th>92</th>
<th>150</th>
<th>64</th>
<th>75</th>
<th>92</th>
<th>150</th>
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<tbody>
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<td>2x13mm FIBEROCK®</td>
<td>-/30/30</td>
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<td>50–62</td>
<td>51–64</td>
<td>52–65</td>
<td>49–62</td>
<td>50–63</td>
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<td>50–64</td>
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<td>48–65</td>
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<td>57–69</td>
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<td>55–73</td>
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<td>2x16mm FIBEROCK®</td>
<td>-/120/120</td>
<td>58–69</td>
<td>59–71</td>
<td>60–73</td>
<td>61–74</td>
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<td>57–72</td>
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<td>57–75</td>
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### TABLE 30: TIMBER-STUD WALLS LINED ONE SIDE

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<th>LINING SIDE 1</th>
<th>LINING SIDE 2</th>
<th>STUD SIZE mm</th>
<th>ANY STUD</th>
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<tbody>
<tr>
<td></td>
<td>FRR (from lining side only)</td>
<td>R_w</td>
<td>STC</td>
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<td>non-fire rated</td>
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<td>1x16mm FIBEROCK®</td>
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<td>-/30/30</td>
<td>30</td>
</tr>
<tr>
<td>TOF60.1</td>
<td>2x16mm FIBEROCK®</td>
<td>-</td>
<td>-/60/60</td>
<td>36</td>
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<tr>
<td>TOF90.1</td>
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<td>-</td>
<td>-/90/90</td>
<td>40</td>
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### TABLE 31: TIMBER-STUD WALLS LINED BOTH SIDES

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<tr>
<th>SYSTEM</th>
<th>LINING SIDE 1</th>
<th>LINING SIDE 2</th>
<th>STUD SIZE mm</th>
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<th>90</th>
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<td>1x13mm FIBEROCK®</td>
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<td>-/120/120</td>
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### TABLE 32: TIMBER-STUD FURRED WALLS

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<td>1x13mm FIBEROCK®</td>
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<td>41-52</td>
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<tr>
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<td>-/30/30</td>
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<td>1x16mm FIBEROCK®</td>
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<td>43-55</td>
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<td>2x13mm FIBEROCK®</td>
<td>-/90/90</td>
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### TABLE 33: STAGGERED TIMBER-STUD WALLS

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<th>Lining Side 2</th>
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### TABLE 34: TWIN TIMBER-STUD WALLS

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<td>TTF30.1</td>
<td>1x13mm FIBEROCK®</td>
<td>1x13mm FIBEROCK®</td>
<td>-/30/30</td>
<td>45-56</td>
<td>46-59</td>
<td>43-58</td>
<td>43-61</td>
</tr>
<tr>
<td>TTF30.2</td>
<td>1x13mm FIBEROCK®</td>
<td>2x13mm FIBEROCK®</td>
<td>-/30/30</td>
<td>49-61</td>
<td>51-64</td>
<td>49-62</td>
<td>51-65</td>
</tr>
<tr>
<td>TTF60.1</td>
<td>1x16mm FIBEROCK®</td>
<td>1x16mm FIBEROCK®</td>
<td>-/60/60 60/60/60</td>
<td>48-60</td>
<td>49-63</td>
<td>44-61</td>
<td>45-64</td>
</tr>
<tr>
<td>TTF90.1</td>
<td>2x13mm FIBEROCK®</td>
<td>2x13mm FIBEROCK®</td>
<td>-/90/90</td>
<td>56-68</td>
<td>57-71</td>
<td>55-69</td>
<td>55-72</td>
</tr>
<tr>
<td>TTF120.1</td>
<td>2x16mm FIBEROCK®</td>
<td>2x16mm FIBEROCK®</td>
<td>-/120/120</td>
<td>58-70</td>
<td>60-73</td>
<td>57-71</td>
<td>57-74</td>
</tr>
</tbody>
</table>
CONSTRUCTION DETAILS

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TIMBER-STUD FIRE WALLS

Wall Installation — Single Layer

- Fasten board into top and bottom plates
- Screws 10–16mm min from sheet edges
- Refer to Table below for max screw spacings in fire rated systems
- Nog required behind single-layer tapered joint
- Fasten board into top and bottom plates
- Screws 10–16mm min from sheet edges
- Refer to Table below for max screw spacings in fire rated systems
- Refer to head and base details on pages 75-76 for any gap requirements.

- Refer to Table above for min joint offsets in fire rated systems
- Figure 83: Fire rated timber stud – horizontal fixing – single layer
- Figure 84: Fire rated timber stud – vertical fixing – single layer

**MINIMUM JOINT OFFSETS (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
<th>Vertical Joints</th>
<th>Horizontal Joints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner/single layers on opposite sides or Adjacent layers on same side</td>
<td>One stud spacing (300 min)</td>
<td>300</td>
</tr>
</tbody>
</table>

**MAXIMUM SCREW SPACING (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
<th>Intermediate Studs</th>
<th>Vertical Edges, Top and Bottom Plates</th>
<th>Internal/External Corners &amp; Around Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer/ single layer</td>
<td>300</td>
<td>200 (stagger screws in abutting sheets)</td>
<td>200</td>
</tr>
<tr>
<td>Inner layers</td>
<td>600</td>
<td>600</td>
<td>600</td>
</tr>
</tbody>
</table>
Wall Installation — Multiple Layers

Top plate
Timber studs @ 600mm max ctrs
Refer to Table below for min joint offsets in fire rated systems
Acoustic insulation if required
2 layers of Fiberock® linings to each face

Bottom plate
Fasten board into top and bottom plates
Tape and set joints to external layers only
Refer to Table below for max screw spacings in fire rated systems
Fasteners 10–16mm from edge of sheet
Refer to head and base details on pages 75-76 for any gap requirements.

Refer to Fastener details, Tables 9 & 10, page 14
Refer to head and base details on pages 75-76 for any gap requirements.

**MINIMUM JOINT OFFSETS (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
<th>Vertical Joints</th>
<th>Horizontal Joints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner/single layers on opposite</td>
<td>One stud spacing</td>
<td>300</td>
</tr>
<tr>
<td>sides or Adjacent layers on same</td>
<td>(300 min)</td>
<td></td>
</tr>
<tr>
<td>side</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MAXIMUM SCREW SPACING (mm)**

<table>
<thead>
<tr>
<th>Lining Layer</th>
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<td>600</td>
<td>600</td>
<td>600</td>
</tr>
</tbody>
</table>

Fasteners @ 600mm max in first layers

Figure 85: Fire rated timber stud – vertical fixing – multiple layer

Figure 86: Fire rated timber stud – horizontal fixing – multiple layer
Ensure that the Fiberock® lining is lapped over on interior and exterior walls.  

Fiberock® lining between timber packers to be the same FRR as the walls.  

Sealant to suit the FRR rating of the wall.  

2 x timber packers at angle intersection.  

External corner bead (typical).  

USG Boral #093 control joint section.  

USG Boral corner reinforcement tape.  

Control joint for walls over 12m in length.  

USG Boral cornice adhesive or FRR sealant to be the same FRR as the wall or greater.  

USG Boral cornice adhesive or FRR sealant to be the same FRR as the wall or greater.  

USG Boral #093 control joint section.  

Figure 87: Single-lining terminal, junction and control joint details.
Terminals, Junctions & Control Joints

Ensure that the Fiberock® lining is lapped over on interior and exterior walls.

External corner bead (typical)

USG Boral #093 control joint section

Fiberock® lining

2 x timber packers at angle intersection

USG Boral corner reinforcement tape

USG Boral cornice adhesive or FRR sealant to be the same FRR as the wall or greater

USG Boral #093 control joint section

Fiberock® lining between timber packers to be the same FRR as the walls

Control joint for walls over 12m in length

USG Boral cornice adhesive or FRR sealant to be the same FRR as the wall or greater

External corner bead (typical)

Fiberock® lining running through

Alternative “T” intersection

Fiberock® lining

USG Boral corner reinforcement tape

Additional stud to support plasterboard corner as required

USG Boral corner reinforcement tape

Friction or screw bolt to suit fixing into block/concrete wall. Refer to engineer’s details

Sealant to suit the FRR rating of the wall

Figure 88: Multi-lining terminal, junction and control joint details
TIMBER-STUD FIRE WALLS

Wall Junctions

**Figure 89:** Staggered stud framing corner intersection

**Figure 90:** Staggered stud wall T-junction detail

**NOTES:**
- for 90mm top and bottom plate use 70 x 45mm studs NLB
- for 140mm top and bottom plate use 90 x 45 studs NLB, or 90 x 45 studs LB
- All timber framing to be designed by engineer or NZS 3604:2011
Wall Junctions

Figure 91: Twin stud wall corner intersection, single lining

- Studs at 600 ctrs max
- Fiberock® lining to framing. Refer to specified system for FRR and lining type
- Internal corners USG Boral paper tape
- Timber packer
- 90 x 45mm SG8 timber framing to NZS 3604:2011
- Screw fixing
  - 36 x 6g screws for /30/30 NLB
  - 42 x 7g screws for 60/60/60 LB
- External metal corner bead (typical)
- 20mm min

Figure 92: Twin stud wall T-junction, single lining

- Studs at 600 ctrs max
- Internal corners USG Boral paper tape
- 90 x 45mm SG8 timber framing to NZS 3604:2011
- Timber packer
- Fiberock® lining to framing. Refer to specified system for FRR and lining type
- Screw fixing
  - 36 x 6g screws for /30/30 NLB
  - 42 x 7g screws for 60/60/60 LB
- 20mm min

September 2020
USG Boral New Zealand

Construction Details
**TIMBER-STUD FIRE WALLS**

**Wall Junctions**

- Add additional stud for end wall support
- Fiberock® lining x2 to framing. Refer to specified system for FRR and layers
- Internal corners USG Boral paper tape
- Add additional stud for end wall support
- 90 x 45 SG8 timber framing to NZS 3604:2011

**Figure 93:** Twin stud corner intersection, multi-lining

- 20mm min
- Studs at 600 ctrs max
- External metal corner bead (typical)

**Figure 94:** Twin stud wall T-junction, multi-lining

- Screw fixing
  - 60/60 NLB inner 36 x 6g screws
  - 60/60 NLB outer 42 x 7g screws
  - 120/120/120 LB inner 42 x 7g screws
  - 120/120/120 LB outer 52 x 8g screws
- Internal corners USG Boral paper tape
- Fiberock® lining x2 to framing. Refer to specified system for FRR and layers
- 90 x 45 SG8 timber framing to NZS 3604:2011
Head Details

Fasteners @ 600mm ctrs max to engineer’s details

Layers of Fiberock® lining as required and fixed to standard fire rated details

Floor of equivalent FRR

6–10mm gap filled with fire-grade sealant

Timber-stud framing to engineer’s details

Figure 95: Standard timber stud wall – head detail

Fasteners @ 600mm ctrs max to engineer’s details

Floor of equivalent FRR

Deflection limit 20mm or to specific engineering design

Bead of approved fire/acoustic sealant

1x25mm Shaftliner™ or 2x13mm Fiberock®

Deflection head track

Figure 96: Standard timber stud wall – deflection head detail

Fasteners @ 600mm ctrs max to engineer’s details

Floor of equivalent FRR

Min 5mm-deep fire-grade sealant

Fasteners min 20mm below track flange

Deflection head track

Min 16mm-deep fire-grade sealant

Deflection limit

29mm IBS rod

Timber-stud framing to engineer’s details

Figure 97: Alternative timber stud wall – deflection head detail

Notes:
Maximum FRR 120/120/120.
Caulk all gaps with USG Boral cornice adhesive or Firesound sealant.
Head track reaction and fastenings to engineer’s designs.
TIMBER-STUD FIRE WALLS

Base Details

Fasteners @ 600mm ctrs max to engineer’s details

Continuous bead of acoustic sealant behind top/bottom plate if required

Fix Fiberock® lining hard to floor. Fill any gaps with fire-grade sealant

Figure 98: Standard timber stud wall – base detail

Internal corners USG Boral Sheetrock® paper tape

Non-FRR wall

FRR wall lining must be continuous through the intersection

FRR wall

NOTE: This application applies to both timber and steel walls.

Figure 99: Non-fire rated wall to fire-rated wall T-intersection
Roof Head Details

52 x 8g screws into top plate

Fire-retardent roofing underlay to the same FRR as the wall

52 x 8g screws into rafters

Rafters/truss to NZS 3604:2011

Timber battens/purlins to NZS 3604:2011

Full-height timber stud wall to the underside of the roof structure

1200mm maximum centres

1200mm maximum width for FRR underlay

Ceramic FRR wool (Rockwool) hard up to the underside of the metal roof cladding

Fire-retardent roofing underlay to the same FRR as the wall

52 x 8g screws into rafters

30 x 5mm steel flats fixed to rafters/truss to top of wall at 1200mm ctrs maximum

USG Boral Fiberock® to both sides of timber framing linings as required, fixed to standard fire rated details

Figure 100: FRR Wall-to-roof details – section view

Figure 101: FRR Wall to roof details
TIMBER-STUD FIRE WALLS

Fire & Acoustic Wall Details

Timber-stud framing to engineer’s details

80mm min

Timber inserts fixed vertically between noggings. Alternatively, extra nogging can be fixed for attaching sound isolation mounts

One or two layers of Fiberock® lining fixed vertically or horizontally to furring channel. Lining thickness and type as required to achieve required fire and/or acoustic performance

Rondo 28mm furring channels fixed vertically on Rondo STWC Sound Isolation Mounts

Rondo STWC Sound Isolation Mount fixed @ 1200mm max vertical ctrs and to every stud with 6g x 50mm W type screws

1 or 2 layers of Fiberock® lining fixed vertically or horizontally to timber stud. Lining thickness and type as required to achieve required fire and/or acoustic performance

Fix Fiberock® lining hard to floor. Fill any gaps with fire grade sealant.

Fasteners @ 600mm ctrs to engineer’s details

Bottom plate

100mm max

Also applies at top plate

Figure 102: Sound isolation mount – corner detail

Figure 103: Sound isolation mount – base detail
STEEL-STUD FIRE WALLS

Wall Installation — Single Layer

- Top track
- Bottom track
- 1 layer Fiberock® lining to each face
- Acoustic insulation if required
- C-studs @ 600mm max ctrs
- 60mm nom

Refer to Table below for min joint offsets
Butt joints to fall on studs
Refer to Table below for max screw spacings
Nog behind joint
1 layer Fiberock® lining to each face
C-studs @ 600mm max ctrs
Acoustic insulation if required
Bottom track

Figure 105: Fire rated steel stud — vertical fixing — single layer

<table>
<thead>
<tr>
<th>MINIMUM JOINT OFFSETS (mm)</th>
<th>Lining Layer</th>
<th>Vertical Joints</th>
<th>Horizontal Joints</th>
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<td>Inner layers</td>
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<td>600</td>
<td></td>
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</tbody>
</table>

Figure 104: Fire rated steel stud — horizontal fixing — single layer

- Top track
- C-studs @ 600mm max ctrs
- Acoustic insulation if required
- 1 layer Fiberock® lining to each face
- Bottom track

Refer to Table below for min joint offsets
Do not fasten Fiberock® to top and bottom tracks
Tape and set joints
Screws 10–16mm min from sheet edges
Refer to head and base details on pages 85-86 for any gap requirements.
Screws 10–16mm min from edge of sheet

Refer to Fastener details, Tables 9 & 10, page 14

60mm nom

Figure 105: Fire rated steel stud — vertical fixing — single layer
STEEL-STUD FIRE WALLS

Wall Installation — Multiple Layers

MINIMUM JOINT OFFSETS (mm)

<table>
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MAXIMUM SCREW SPACING (mm)

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<td>600</td>
<td>600</td>
<td>600</td>
</tr>
</tbody>
</table>

Figure 106: Fire rated steel stud — horizontal fixing — multiple layer

Figure 107: Fire rated steel stud — vertical fixing — multiple layer
**Terminals, Junctions & Control Joints**

- **Steel studs**
  - 2 x layers of **Fiberock® lining** to be the same FRR as the walls
  - Sealant to suit FRR rating of the wall
  - Friction or screw bolt to suit fixing into block/concrete wall. Refer to engineer's details

- **Control joint for walls over 12m in length**
  - **USG Boral Fiberock® packer** to be same FRR as walls
  - 0.75mm BMT galv sheet-steel corner reinforcement screwed to studs at 400 ctrs to height of wall

- **External corner bead** (typical)
  - **USG Boral #093 control joint section**
  - USG Boral corner reinforcement tape
  - **2 x layers of Fiberock® lining** to be the same FRR as the walls

- **Alternative “T” Intersection Fibercrokr® running through**
  - **USG Boral corner reinforcement tape**
  - **Steel C-stud**

- **Notes:**
  - Control joints must coincide with those occurring in the main building structure and/or at maximum 12m centres.
  - Location of control joints should be verified with a structural engineer.
  - For screws, refer to Tables 9 & 10, page 14.
STEEL-STUD FIRE WALLS

Terminals, Junctions & Control Joints

Figure 109: Single-stud terminal, junction and control joint details — 2x layers Fiberock®
(twin-stud & staggered-stud layout similar)
Wall Junctions

Fiberock® lining
Fix to standard fire details

Rondo 40 x 40 x 0.75 BMT steel
gle angle full height to all corners.
Fasten to adjacent stud

Internal corners USG Boral
paper tape

Studs to provide support
at corner

Rondo C-studs at no greater
than 600mm ctrs

Extra studs to provide support
at corner

External metal corner
bead (typical)

Figure 110: Twin steel-stud T-junction detail

Figure 111: Twin steel-stud corner detail
STEEL-STUD FIRE WALLS

Wall Junctions

Figure 112: Staggered steel-stud T-junction detail

Figure 113: Staggered steel-stud corner detail
Base Details

- **Fasteners @ 600mm ctrs max** to engineer’s details
- **Bottom track**
- **Continuous bead of acoustic sealant under bottom track if required**
- Fix Fiberock® lining each side
- **Rondo C-studs at no greater than 600mm ctrs each side**
- **Appropriate bottom track to suit application**
- Fix Fiberock® hard to floor. Fill any gaps with fire-grade sealant
- **USG Boral fire-resistant lining**
- **Continuous bead of acoustic sealant under bottom track if required**
- **Bottom track**
- Fix USG Boral fire-resistant plasterboard hard to floor. Fill any gaps fill with fire-grade sealant
- **Fasteners @ 600mm ctrs max to engineer’s details**

**WET AREA SIDE**

- **USG Boral fire- and water-resistant lining (Multistop™ 4 or Fiberock®)**
- **Ceramic wall tiles**
- **Wet area flashing if required**
- **Flexible sealant relief joint**
- **Floor tiles**
- **6–10mm fire-grade wet area sealant**

**Figure 114:** Partition base detail

**Figure 115:** Staggered-stud base detail

**Figure 116:** Partition wet area base detail
STEEL-STUD FIRE WALLS

Head Details

Fasteners @ 600mm ctrs max to engineer's details
Top track — a light-gauge aluminium rivet may be used to secure stud to top track if required to assist with lining installation
Fiberock® lining each side

Concrete soffit of equivalent FRR
16mm gap
Caulk perimeter gaps with fire-grade sealant
Rondo C-studs at no greater than 600mm ctrs

Figure 117: Partition head detail

Fasteners @ 600mm ctrs max to engineer's details
20mm gap or to specific engineering design
Bond of approved fire/acoustic sealant
Caulk perimeter gaps with fire-grade sealant
Deflection head track
Nogging track as required
Fiberock® lining each side
Rondo C-studs at no greater than 600mm ctrs

Figure 118: Deflection head detail — Option A

Figure 119: Deflection head detail — Option B

Fasteners @ 600mm ctrs max to engineer's details
Appropriate top track to suit application
Clip — ex Rondo 140 track. Screw to stud only
Fiberock® lining as required

Concrete soffit of equivalent FRR
Gap as required to suit application
Caulk perimeter gaps with fire-grade sealant
Rondo C-studs at no greater than 600mm ctrs each side

Figure 120: Staggered-stud head detail
COMPOSITE FLOORS

Head Details

**Figure 121**: Steel-stud wall parallel to rib profile — timber blocking Option A

**Notes:**
- Aluminum rivets may be used to secure steel framing to deflection head for stability prior to lining.
- FRR Fiberock® layers may be different as shown. Refer to Steel-Stud section for layer combinations and fixing requirements.
- Steel framing is NLB.
- Refer to composite floor manufacturer for fastener installation limitations.
- Deflection head details are suitable for single, staggered and twin-stud walls.

**Figure 122**: Steel-stud wall parallel to rib profile — timber blocking Option B
COMPOSITE FLOORS

Head Details

- Timber packer to suit profile
- Bolt deflection head to underside of floor. Refer to engineer’s bolt size, length and spacing
- Fire rated sealant to be the same FRR as Fiberock® lining or greater

Figure 123: Steel-stud wall perpendicular to rib profile
STEEL-STUD FIRE WALLS

Door Details

Figure 124: **Door head trimmer detail**

Figure 125: **Door head detail**

Figure 126: **Door jamb detail**
STEEL-STUD FIRE WALLS

Head Details

Figure 127: Fire rated wall to fire rated ceiling detail

Figure 128: Fire rated wall deflection head to fire rated ceiling detail
Australia
China
India
Indonesia
Malaysia
Middle East
New Zealand
Thailand
Philippines
Singapore
South Korea
Vietnam

53 Tidal Road
Mangere
Auckland
(09) 930-9182

5c Riddlers Cres
Petone
Wellington
(04) 595-4307

98 Wigram Road
Wigram
Christchurch
(03) 595 1542

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