

# BRACE+™

## PLASTERBOARD BRACING MANUAL

VERSION 2



**USG BORAL**  
INNOVATION INSPIRED BY YOU.™



[USGBoral.com](https://www.usgboral.com)

Plasterboard

Ceilings

Cornice

Compounds

System Solutions

## GENERAL INFORMATION

### PREFACE

USG Boral Building Products is a plasterboard and ceilings joint venture between USG Corporation and Boral Limited. It is one of the leading manufacturers in this field.

Operating throughout Asia, Australia, the Middle East and New Zealand, USG Boral Building Products combines innovative building products and superior technology for the construction sector and provides products and systems that exceed the compliance requirements of each market.

USG Boral Building Products is well positioned to service the New Zealand market, with manufacturing facilities in Australia and distribution facilities in Auckland, Wellington and Christchurch.

For more information on USG Boral Building Products refer to [www.usgboral.com](http://www.usgboral.com) or phone 0800 USGBORAL (0800 874-467).

### INTRODUCTION

USG Boral Bracing Systems technology has been specifically designed and rigorously tested in New Zealand to provide structural bracing for both residential and light commercial buildings within the scope and limitations of the current NZS 3604:2011 Standard. USG Boral Bracing Systems have been tested in accordance with the BRANZ P21 (2010), a wall bracing test and evaluation procedure; cited in NZS 3604:2011 *Timber framed buildings* to determine the wind and earthquake ratings of bracing elements. This aligns with the new loadings standard AS/NZS 1170.

### TECHNICAL ASSISTANCE

For technical assistance please phone 0800 USGBORAL (0800 874-467) or visit [www.usgboral.com](http://www.usgboral.com).

### WARRANTY

For more information on USG Boral Building Products warranty please refer to [www.usgboral.com](http://www.usgboral.com) or phone 0800 USGBORAL (0800 874-467).

### LIABILITY

USG Boral will not accept any liability for its bracing products and systems which are not correctly installed as stipulated in this manual.

### ISO 9000 QUALITY ASSURANCE

USG Boral Building Products Pty Ltd is a certified ISO 9001 - 2008 manufacturer No. QEC 0400 by SAI Global



### BENEFITS OF USING USG BORAL BRACING SYSTEMS

USG Boral Bracing Systems use superior lightweight and multi-performance plasterboards to provide the structural performance to panel bracing systems.

Bracing with USG Boral Systems is supported by BRACE+, our latest cloud-based bracing software; allowing the user to access calculations from any computer with internet access and store an unlimited number of projects. Try Brace+ at [www.braceplus.co.nz](http://www.braceplus.co.nz)

### LIMITATIONS OF USE

- To be used within the scope and limitations of the current NZS 3604:2011 Standard
- For interior use only
- Plasterboard bracing is not permitted for use in wet areas, behind showers and baths.

### WHO MAY INSTALL USG BORAL BRACING SYSTEMS

Installation of the USG Boral Bracing Systems must be undertaken or supervised by a Licensed Building Practitioner with the appropriate licence category where the building work has been identified as restricted building work.

### HEALTH & SAFETY

It is important to follow good site practice at all times and to ensure appropriate safety precautions are taken when installing the USG Boral Bracing Systems and all supporting components.

### COMPATIBILITY WITH ASSOCIATED PRODUCTS

The USG Boral Bracing Systems and their components are compatible with most associated building products. However, it is recommended that the installer seeks advice if in doubt.

### PERFORMANCE

The performance of the USG Boral Bracing Systems is detailed in the summary table on page 3. The values for wind and earthquake were obtained from testing and evaluation that was carried out in accordance with the P21 (2010) test and evaluation procedures.

### APPRAISAL/CODEMARK

USG Boral Bracing has been assessed by BRANZ and CertMark as meeting the relevant NZBC performance clauses.



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## USG BORAL BRACING SYSTEMS SUMMARY TABLE

The bracing values detailed in the below table were determined by testing USG Boral Bracing Systems in accordance with the current NZS 3604:2011 and the P21 (2010) test and evaluation method.

USG BORAL WALL BRACING SYSTEMS							
BRACING SYSTEM REFERENCE	SYSTEM DESCRIPTION	BOARD TYPE	HOLD DOWNS	MINIMUM WALL LENGTH (M)	MAXIMUM WALL LENGTH (M)	WIND VALUE BU/M	EARTHQUAKE VALUE BU/M
UB1S	10mm SHEETROCK® on one side	SHEETROCK®	No	0.4	6.0	55	50
UB2S	10mm SHEETROCK® on both sides	SHEETROCK®	No	0.4	4.8	65	60
UB1M	10mm MULTISTOP on one side, with hold downs	MULTISTOP	Yes	0.4 1.2	1.2 2.4	85 100	85 85
UBSM	10mm MULTISTOP on one side & 10mm SHEETROCK® on the other side, with hold downs	MULTISTOP & SHEETROCK®	Yes	0.6	2.4	130	125
UBMP	10mm MULTISTOP on one side & 7mm DD structural plywood the other side, with hold downs	MULTISTOP & Plywood	Yes	0.4 0.6 1.2	0.6 1.2 2.4	90 120 150	110 130 150
UB1FR	13mm FIBEROCK on one side, with hold downs	FIBEROCK	Yes	0.4 1.2	1.2 4.8	105 145	125 140
UB2FR	13mm FIBEROCK on both sides, with hold downs	FIBEROCK	Yes	0.4 1.2	1.2 2.4	115 150	130 150
UBFRP	13mm FIBEROCK on one side & 7mm DD structural plywood on the other side, with hold downs	FIBEROCK & Plywood	Yes	0.4 1.2	1.2 2.4	105 150	130 150

### NOTES:

- USG Boral have additional bracing systems available. Please contact USG Boral for further information.
- Maximum hold down rating for NZS 3604:2011 timber floors is 120BU's/m.
- Maximum hold down rating for NZS 3604:2011 concrete floors is 150BU's/m.

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.

Refer to the USG Boral BRACE+ software 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 [www.braceplus.co.nz](http://www.braceplus.co.nz).

# USG BORAL WALL BRACING SYSTEM UB1S

USG Boral Bracing Systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UB1S bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB1S – PERFORMANCE		
<b>UB1S</b>	10mm SHEETROCK® plasterboard installed vertically or horizontally on one side	
	Bracing element wall lengths	0.4–6.0m
	Bracing units/metre – Wind	55
	Bracing units/metre – Earthquake	50

USG BORAL SYSTEM UB1S – COMPONENTS	
USG Boral lining type	10mm SHEETROCK® ceiling & wall plasterboard on one side*
Fasteners	6g x 32mm coarse-threaded gypsum screws for timber substrate
Hold-down anchors	N/A
Hold-down brackets	N/A
Hold-down straps	N/A
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. Refer current NZS 3604:2011, Section 8
Jointing plaster	USG Boral range of plaster compounds
Note: It is not permitted to use nails or adhesive to replace fasteners.	

USG BORAL SYSTEM UB1S – SPECIFICATIONS	
USG Boral plasterboard lining type	The following USG Boral plasterboard lining is permitted for use with the USG Boral UB1S bracing system • 10mm SHEETROCK® ceiling & wall plasterboard*
Fasteners	6g x 32mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. (For corner fixing details refer to Fig. 3.)
Hold-down anchors	Not applicable for this system
Hold-down brackets	Not applicable for this system
Hold-down straps	Not applicable for this system
Adhesive	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of SG8. 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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum bracing wall length 400mm	The minimum permitted wall length of the UB1S bracing system must not be less than 400mm.
Maximum bracing wall length 6000mm	The maximum permitted wall length of the UB1S bracing system must not exceed 6000mm.
Wall height other than 2.4m	Wall heights as determined by the current NZS 3604:2011. Bracing rating to be determined by the following calculation:  Adjusted rating = $\left( \frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$
Bottom plate fixing	<b>Timber floors:</b> Install 2 x 100 x 3.75mm nails or use 3 x 90 x 3.15mm gun nails at 600mm centres as per NZS 3604:2011  <b>Concrete floors:</b> Refer to masonry nail manufacturer's specifications or contact USG Boral: 0800 USG BORAL (0800 874-267)

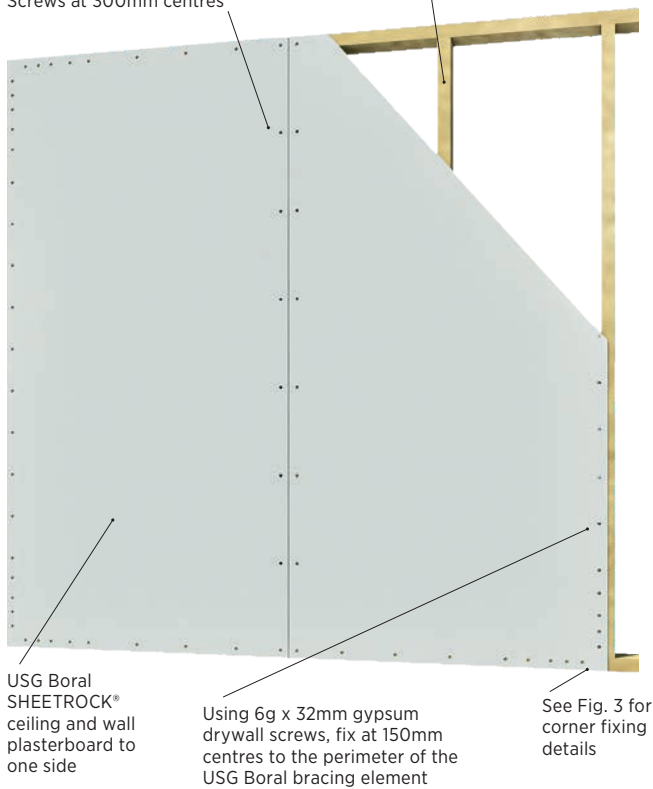
\* Refer to page 26 for Plasterboard Allowable Substitution Table.

### FIG. 1: UB1S BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed

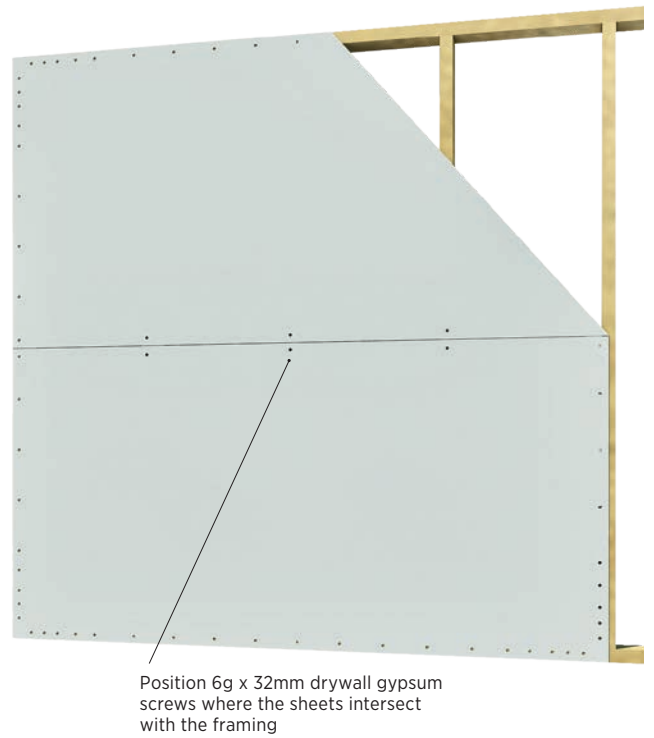
Sheets to be fixed to framing with 6g x 32mm gypsum drywall Screws at 300mm centres

Drywall adhesive to intermediate studs



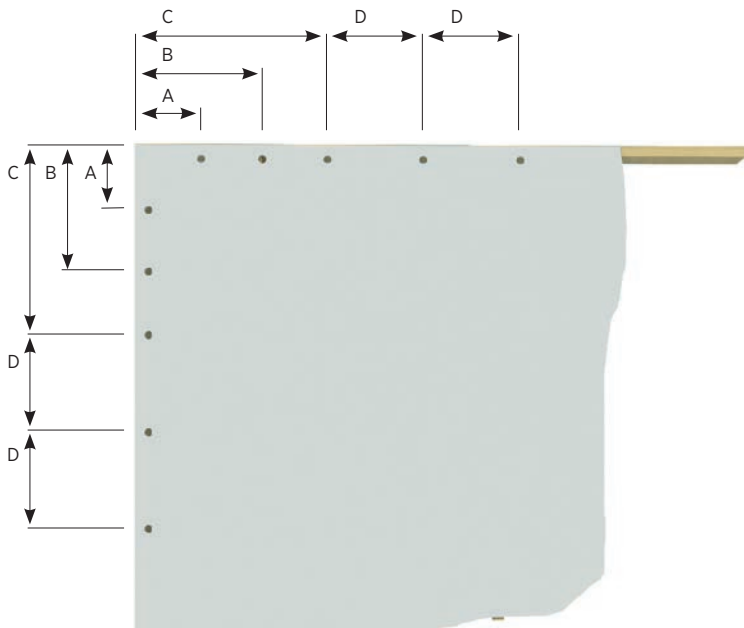
### FIG. 2: UB1S BRACING SYSTEM WITH SHEETS INSTALLED HORIZONTALLY

2.4m long bracing element detailed



### FIG. 3: UB1S CORNER FIXING DETAILS

Each corner of the bracing element



#### 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.

# USG BORAL WALL BRACING SYSTEM UB2S

USG Boral Bracing Systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UB2S bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB2S – PERFORMANCE		
<b>UB2S</b>	10mm SHEETROCK® ceiling & wall plasterboard installed vertically or horizontally on both sides	
	Bracing element wall lengths	0.4–4.8m
	Bracing units/metre – Wind	65
	Bracing units/metre – Earthquake	60

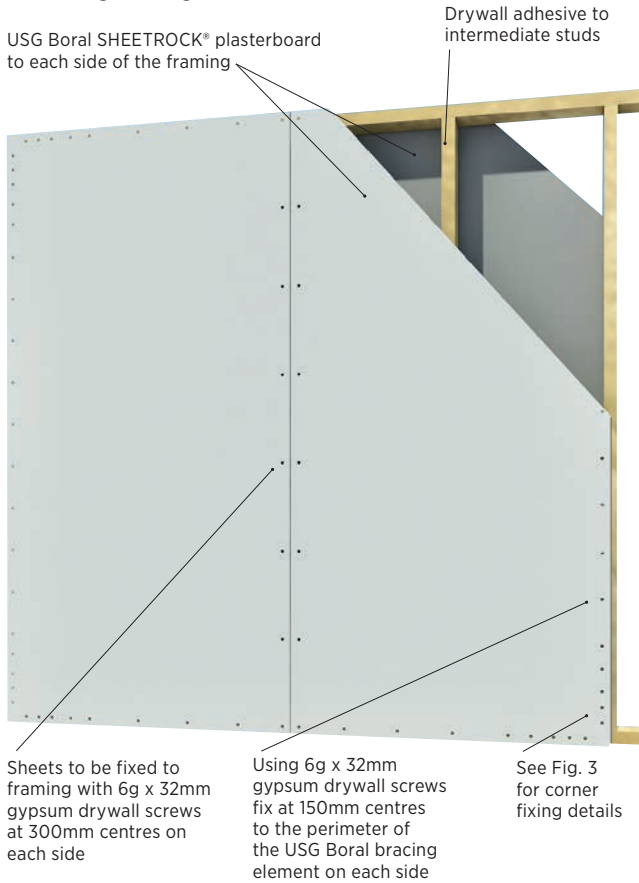
USG BORAL SYSTEM UB2S – COMPONENTS	
USG Boral lining type	10mm SHEETROCK® ceiling & wall plasterboard on both sides*
Fasteners	6g x 32mm coarse-threaded gypsum screws for timber substrate
Hold-down anchors	N/A
Hold-down brackets	N/A
Hold-down straps	N/A
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. Refer current NZS 3604:2011 standard, Section 8
Jointing plaster	USG Boral range of plaster compounds
Note: It is not permitted to use nails or adhesive to replace fasteners.	

USG BORAL SYSTEM UB2S – SPECIFICATIONS	
USG Boral plasterboard lining type	The following USG Boral plasterboard lining is permitted for use with the USG Boral UB2S bracing system • 10mm SHEETROCK® ceiling & wall plasterboard*
Fasteners	6g x 32mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. (For corner fixing details refer to Fig. 3.)
Hold-down anchors	Not applicable for this system
Hold-down brackets	Not applicable for this system
Hold-down straps	Not applicable for this system
Adhesive	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of SG8. 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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum wall length 400mm	The minimum permitted wall length of the UB2S bracing system must not be less than 400mm.
Maximum wall length 4800mm	The maximum permitted wall length of the UB2S bracing system must not exceed 4800mm
Wall height other than 2.4m	Wall heights as determined by the current NZS 3604:2011. Bracing rating to be determined by the following calculation:  Adjusted rating = $\left( \frac{2.4m}{\text{Actual wall height}} \right) \times \text{the bracing value}$
Bottom plate fixing	<b>Timber floors:</b> Install 2 x 100 x 3.75mm nails or use 3 x 90 x 3.15mm gun nails at 600mm centres as per NZS 3604:2011  <b>Concrete floors:</b> Refer to masonry nail manufacturer's specifications or contact USG Boral: 0800 USG BORAL (0800 874-267)

\* Refer to page 26 for Plasterboard Allowable Substitution Table.

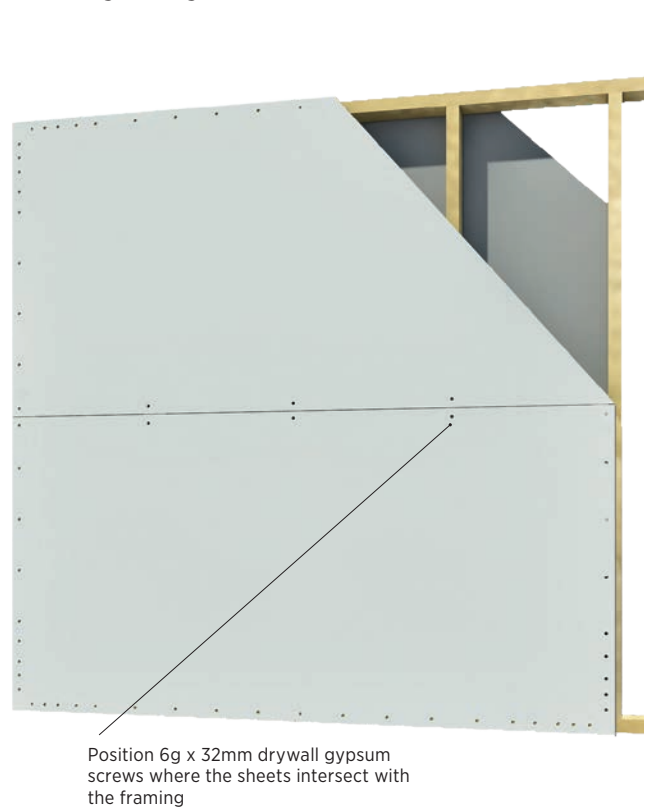
### FIG. 1: UB2S BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed



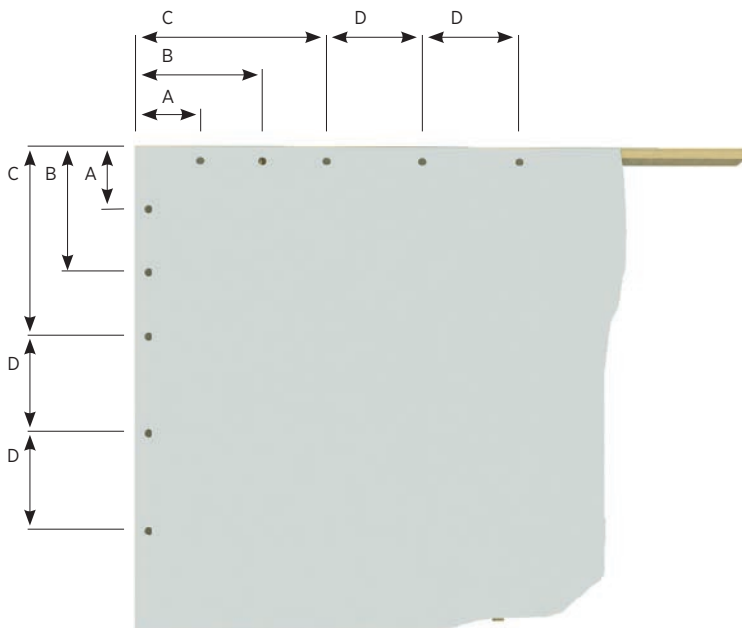
### FIG. 2: UB2S BRACING SYSTEM WITH SHEETS INSTALLED HORIZONTALLY

2.4m long bracing element detailed



### FIG. 3: UB2S CORNER FIXING DETAILS

Each corner of the bracing element



#### 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.



# USG BORAL WALL BRACING SYSTEM UB1M

USG Boral bracing systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UB1M bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB1M – PERFORMANCE			
<b>UB1M</b>	10mm MULTISTOP plasterboard installed vertically or horizontally to one side		
	Bracing element wall lengths	0.4–1.2m	1.2–2.4m
	Bracing units/metre – Wind	85	100
	Bracing units/metre – Earthquake	85	85

USG BORAL SYSTEM UB1SS – COMPONENTS	
USG Boral lining type	10mm USG Boral MULTISTOP plasterboard on one side*
Fasteners	6g x 32mm coarse-threaded gypsum screws for timber substrate.
Hold-down anchors	Yes
Hold-down brackets	Yes
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. See current NZS 3604:2011, Section 8
Jointing plaster	USG Boral range of plaster compounds
Note: It is not permitted to use nails or adhesive to replace fasteners.	

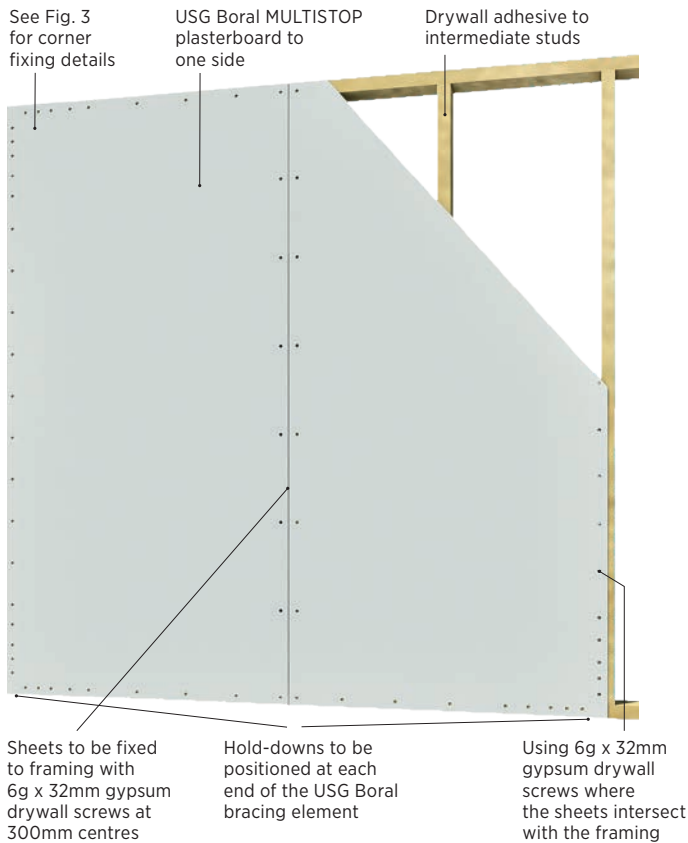
USG BORAL SYSTEM UB1SS – SPECIFICATIONS	
USG Boral plasterboard lining type	The following USG Boral plasterboard lining is permitted for use with the USG Boral UB1M bracing system. • 10mm MULTISTOP plasterboard*
Fasteners	6g x 32mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. (For corner fixing details refer to Fig. 3.)
Hold-down anchors	<b>Concrete floor</b> – Install masonry anchors (minimum 15kN characteristic uplift strength) with 50 x 50 x 3.0mm washers or “J Bolt” set into concrete at a minimum depth of 75mm <b>Timber floor</b> – Install M12 x 200mm galvanised coach screws with 50 x 50 x 3mm washers (ensure bolts are secured into solid blocking.)
Hold-down brackets	Install either hold down brackets or 400 x 25 x 0.9mm galvanised or stainless steel straps
Adhesive	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of SG8. 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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum wall length 400mm	The minimum permitted wall length of the UB1M bracing system must not be less than 400mm.
Maximum wall length 2400mm	The maximum permitted wall length of the UB1M bracing system must not exceed 2400mm.
Wall height other than 2.4m	Wall as determined by the current NZS 3604:2011. Bracing rating to be determined by the following calculation:  Adjusted rating = $\left( \frac{2.4m}{\text{Actual wall height}} \right) \times \text{the bracing value}$

\* Refer to page 26 for Plasterboard Allowable Substitution Table.



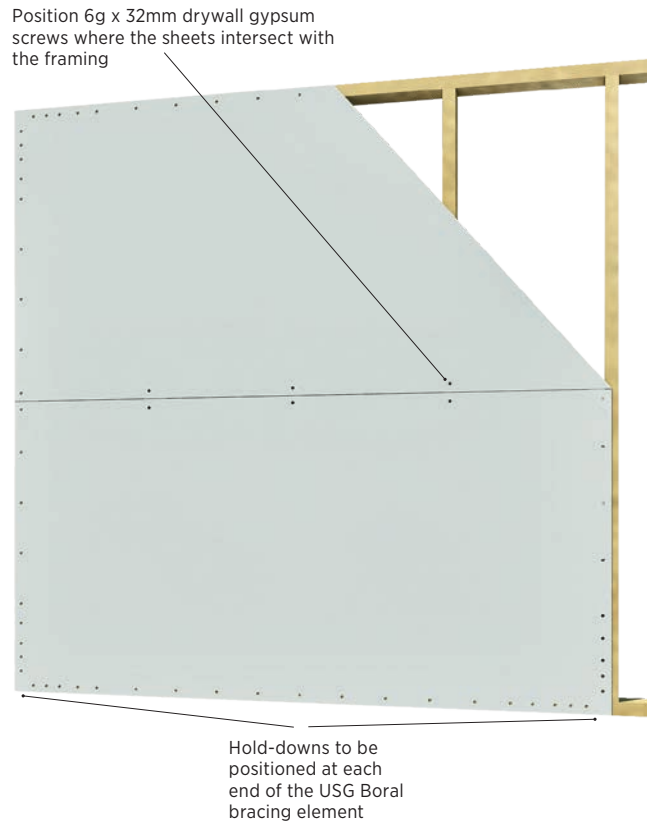
### FIG. 1: UB1M BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed



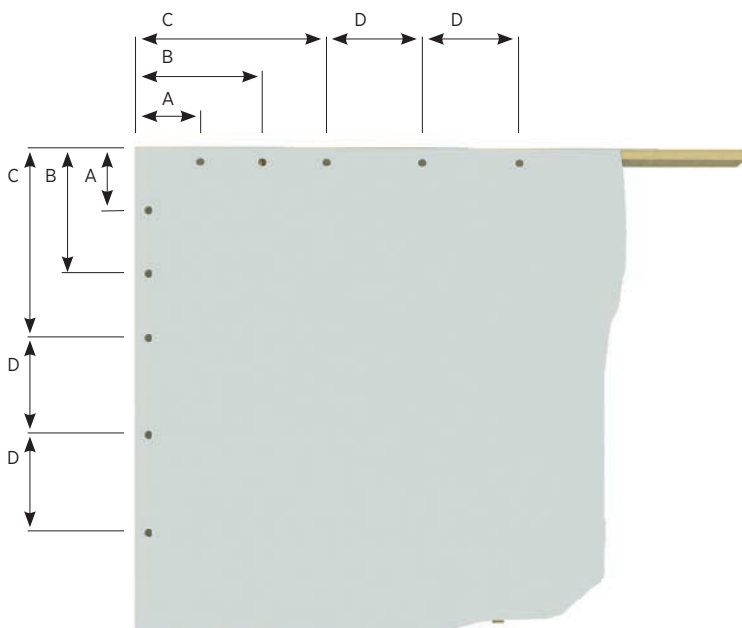
### FIG. 2: UB1M BRACING SYSTEM WITH SHEETS INSTALLED HORIZONTALLY

2.4m long bracing element detailed



### FIG. 3: UB1M CORNER FIXING DETAILS

Each corner of the bracing element



#### 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.

# USG BORAL WALL BRACING SYSTEM UBSM

USG Boral bracing systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UBSM bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UBSM – PERFORMANCE		
<b>UBSM</b>	10mm MULTISTOP plasterboard installed vertically or horizontally to one side and 10mm SHEETROCK® to the other side	
	Bracing element wall lengths	0.6–2.4m
	Bracing units/metre – Wind	130 <sup>#</sup>
	Bracing units/metre – Earthquake	125 <sup>#</sup>

<sup>#</sup> Refer to maximum ratings for concrete and timber floors in the Summary Table p3.

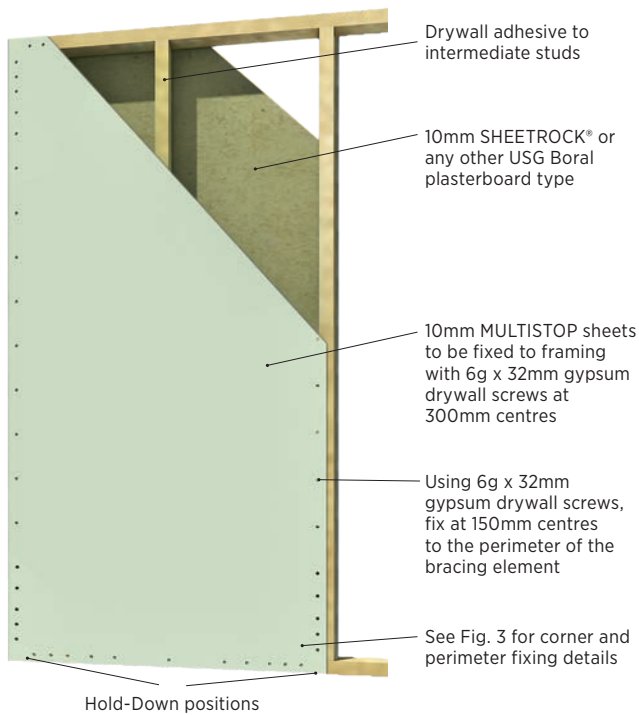
USG BORAL SYSTEM UBSM – COMPONENTS	
USG Boral lining type	10mm MULTISTOP plasterboard on one side*
USG Boral lining type	10mm SHEETROCK® plasterboard other side*
Fasteners	6g x 32mm coarse-threaded gypsum screws for timber substrate
Hold-down anchors	Yes
Hold-down brackets	Yes
Adhesive	Suitable drywall stud adhesive
Framing	Minimum framing grade of SG8. See current NZS 3604:2011, Section 8
Jointing plaster	USG Boral range of plaster compounds
Note: It is not permitted to use nails or adhesive to replace fasteners.	

USG BORAL SYSTEM UBSM – SPECIFICATIONS	
USG Boral plasterboard lining types	The following USG Boral plasterboard linings are permitted for use with the USG Boral UBSM bracing system: • 10mm MULTISTOP* • 10mm SHEETROCK® ceiling & wall plasterboard*
Fasteners	6g x 32mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. (For corner fixing details refer to Fig. 3.)
Hold-down anchors	<b>Concrete floor</b> – Install M12 masonry anchors (minimum 15kN characteristic uplift strength) with 50 x 50 x 3.0mm washer or “J Bolt” set into concrete at a minimum depth of 75mm <b>Timber floor</b> – Install M12 x 200mm galvanised coach screws with 50 x 50 x 3.0mm washer. (Ensure bolts are secured into solid blocking.)
Hold-down brackets	Install either hold-down brackets or 400 x 25 x 0.9mm straps.
Adhesive	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of SG8. 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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum wall length 600mm	The minimum permitted wall length of the UBSM bracing system must not be less than 600mm.
Maximum wall length 2400mm	The maximum permitted wall length of the UBSM bracing system must not exceed 2400mm.
Wall height other than 2.4m	Wall as determined by the current NZS 3604:2011. Bracing rating height to be determined by the following calculation: $\text{Adjusted rating} = \left( \frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$

\* Refer to page 26 for Plasterboard Allowable Substitution Table.

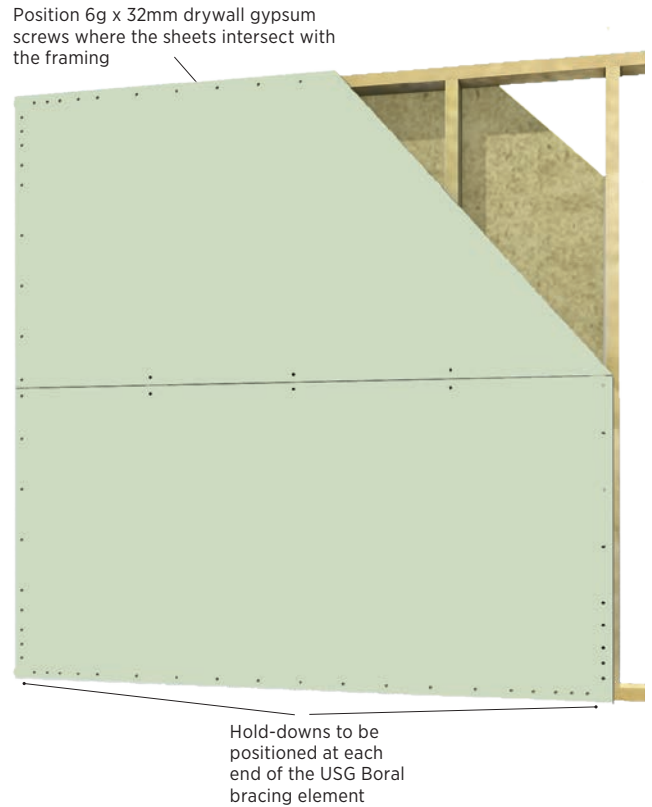
**FIG. 1: UBSM BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY**

1.2m long bracing element detailed



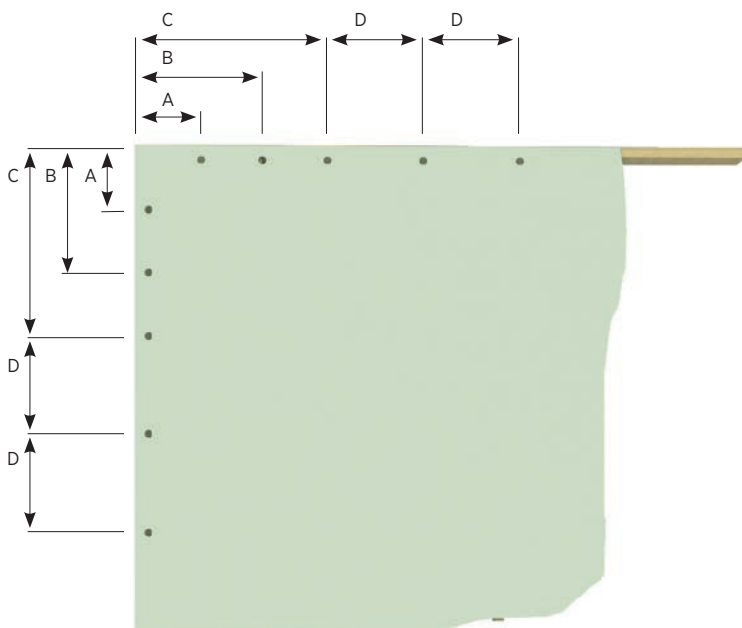
**FIG. 2: UBSM BRACING SYSTEM WITH SHEETS INSTALLED HORIZONTALLY**

2.4m long bracing element detailed



**FIG. 3: UBSM CORNER FIXING DETAILS FOR THE USG BORAL MULTISTOP PLASTERBOARD LINING**

Each corner of the bracing element



**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.

# USG BORAL WALL BRACING SYSTEM UBMP

USG Boral bracing systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UBMP bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UBMP – PERFORMANCE				
<b>UBMP</b>	10mm MULTISTOP plasterboard installed vertically or horizontally to one side and 7mm DD structural plywood to the other side			
	Bracing element wall lengths	0.4–0.6m	0.6–1.2m	1.2–2.4m
	Bracing units/metre – Wind	90	120 <sup>#</sup>	150 <sup>#</sup>
	Bracing units/metre – Earthquake	110	130 <sup>#</sup>	150 <sup>#</sup>

<sup>#</sup>Refer to maximum ratings for concrete and timber floors in the Summary Table p3.

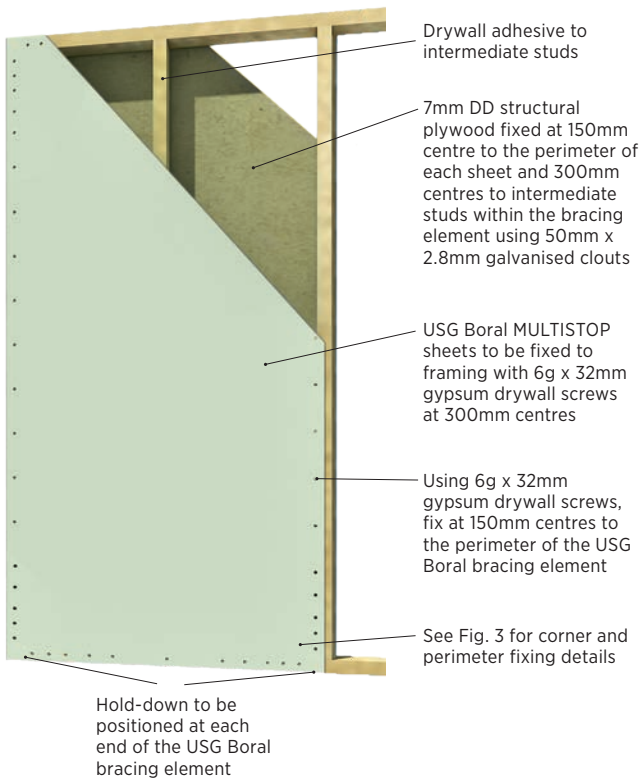
USG BORAL SYSTEM UBMP – COMPONENTS	
USG Boral lining type	10mm MULTISTOP plasterboard on one side*
Plywood	7mm DD structural plywood on the other side
Fasteners	6g x 32mm coarse-threaded gypsum screws for timber substrate
Hold-down anchors	Yes
Hold-down brackets or straps	Yes
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. See current NZS 3604:2011, Section 8
Jointing plaster	USG Boral range
<b>Note: It is not permitted to use nails or adhesive to replace fasteners.</b>	

USG BORAL SYSTEM UBMP – SPECIFICATIONS	
USG Boral plasterboard lining type	The following USG Boral plasterboard lining is permitted for use with the USG Boral UBMP bracing system. • 10mm MULTISTOP*
Plywood	7mm DD structural plywood on the other side. Install plywood with 50 x 2.8mm galvanised nails at 150mm centres to the perimeter and at 300mm centres to the intermediate studs of each plywood sheet.
Fasteners	6g x 32mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. (For corner fixing details refer to Fig. 3)
Hold-down anchors	<b>Concrete floor</b> – Install M12 masonry anchors (minimum 15kN characteristic uplift strength) with 50 x 50 x 3.0mm washer or “J Bolt” set into concrete at a minimum depth of 75mm. <b>Timber floor</b> – Install M12 x 200mm galvanised coach screws with 50 x 50 x 3mm washer. (Ensure bolts are secured into solid blocking.)
Hold-down brackets	Install either hold-down brackets or 400 x 25 0.9mm galvanised or stainless steel straps.
Adhesive	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of SG8. 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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum wall length 400mm.	The minimum permitted wall length of the UBMP bracing system must not be less than 400mm.
Maximum wall length 2400mm.	The maximum permitted wall length of the UBMP bracing system must not exceed 2400mm.
Wall height other than 2.4m	Wall as determined by the current NZS 3604:2011. Bracing rating to be determined by the following calculation:  Adjusted rating = $\left( \frac{2.4m}{\text{Actual wall height}} \right) \times \text{the bracing value}$

\* Refer to page 26 for Plasterboard Allowable Substitution Table.

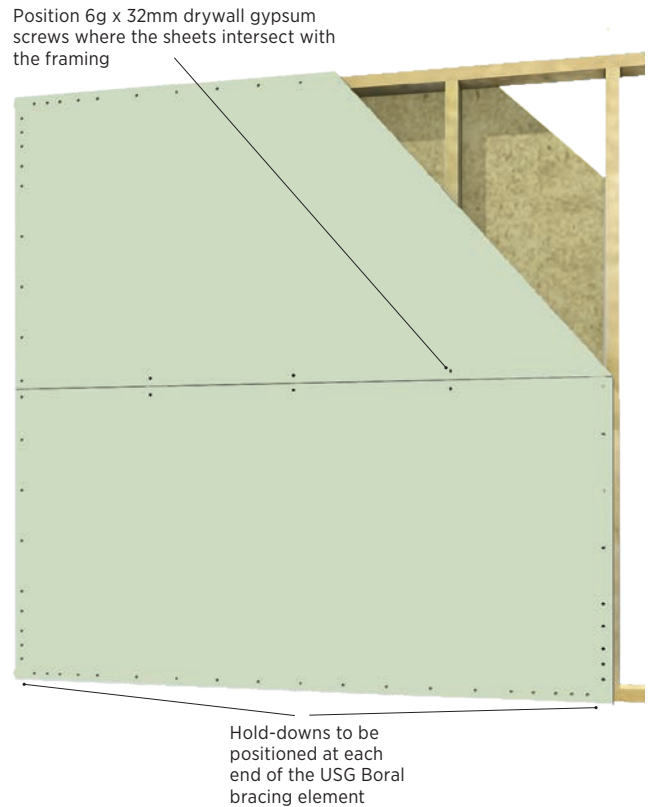
**FIG. 1: UBMP BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY**

1.2m long bracing element detailed



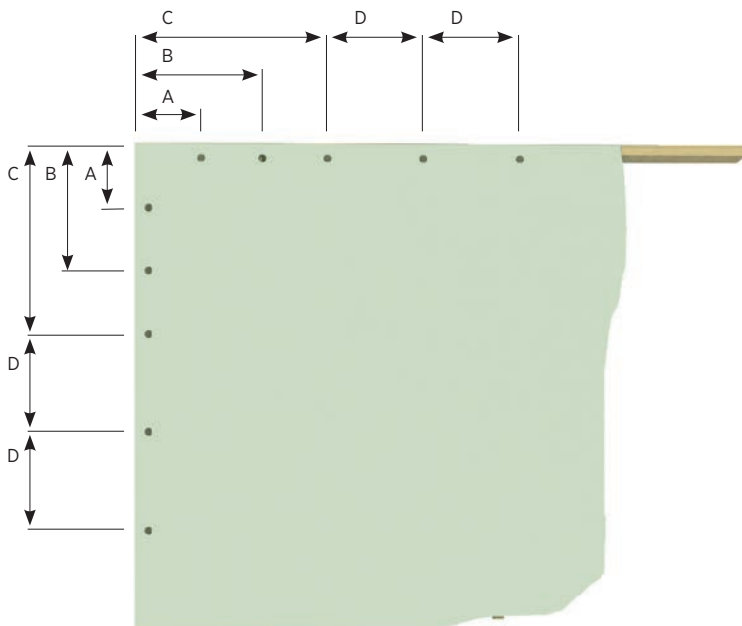
**FIG. 2: UBMP BRACING SYSTEM WITH SHEETS INSTALLED HORIZONTALLY**

2.4m long bracing element detailed



**FIG. 3: UBMP**

Each corner of the bracing element



**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.

## USG BORAL WALL BRACING SYSTEM UB1FR

USG Boral Bracing Systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UB1FR bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in accordance with the installation instructions and diagrams.

### USG BORAL BRACING SYSTEM UB1FR – PERFORMANCE

<b>UB1FR</b>	13mm FIBEROCK Aqua-Tough installed vertically on one side		
	Bracing element wall lengths	0.4–1.2m	1.2m–4.8m
	Bracing units/metre – Wind	105	145 <sup>#</sup>
	Bracing units/metre – Earthquake	125 <sup>#</sup>	140 <sup>#</sup>

<sup>#</sup>Refer to maximum ratings for concrete and timber floors in the Summary Table p3.

### USG BORAL SYSTEM UB1FR – COMPONENTS

USG Boral lining type	13mm USG Boral FIBEROCK Aqua-Tough on one side*
Fasteners	6g x 41mm coarse-threaded gypsum screws for timber substrate
Hold-down anchors	Yes
Hold-down brackets or straps	Yes
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. See current NZS 3604:2011, Section 8
Jointing plaster	USG Boral range of plaster compounds
Note: It is not permitted to use nails or adhesive to replace fasteners.	

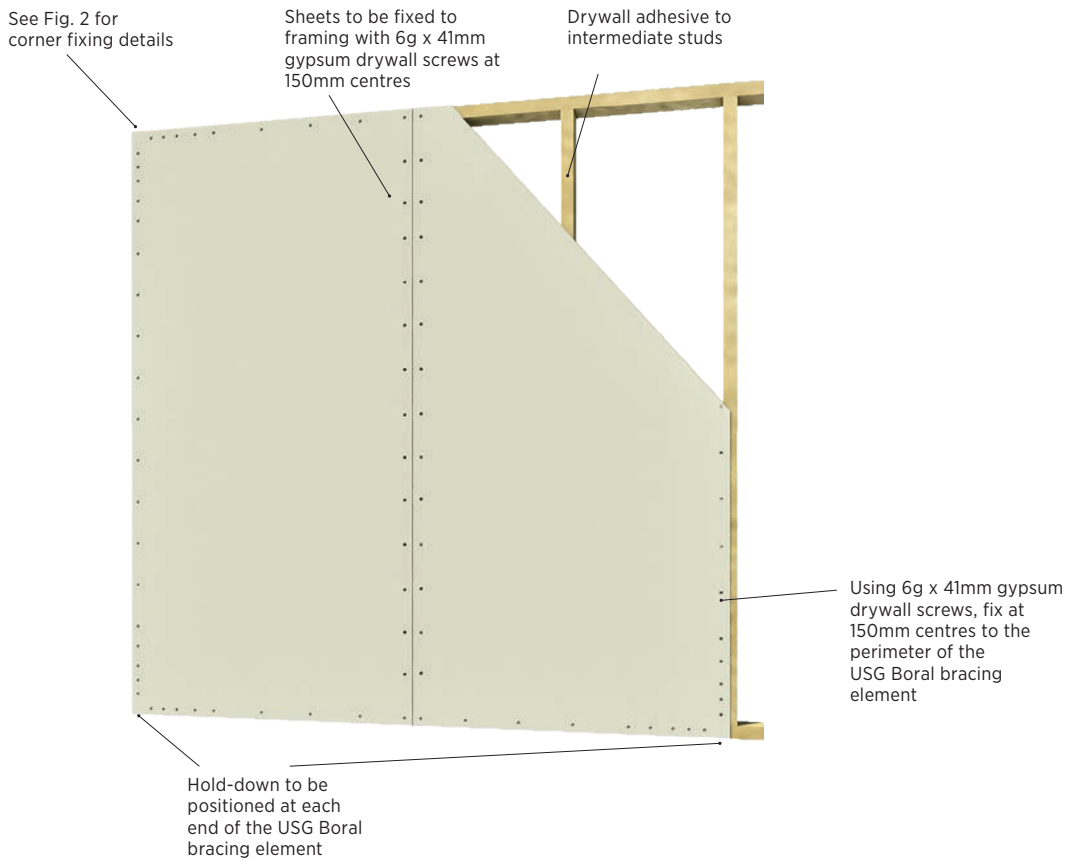
### USG BORAL SYSTEM UB1FR – SPECIFICATIONS

USG Boral lining type	The following USG Boral lining is permitted for use with the USG Boral UB1FR bracing system. • 13mm FIBEROCK Aqua Tough*
Fasteners	6g x 41mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. For corner fixing details refer to Fig. 2.
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 galvanized 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	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of MSG8. 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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum wall length 400mm	The minimum permitted wall length of the UB1FR bracing system must not be less than 400mm.
Maximum wall length 4800mm	The maximum permitted wall length of the UB1FR bracing system must not exceed 4800mm.
Wall height other than 2.4m	Wall heights as determined by the current NZS 3604:2011. Bracing rating to be determined by the following calculation: $\text{Adjusted rating} = \left( \frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$

\* Refer to page 26 for Plasterboard Allowable Substitution Table.

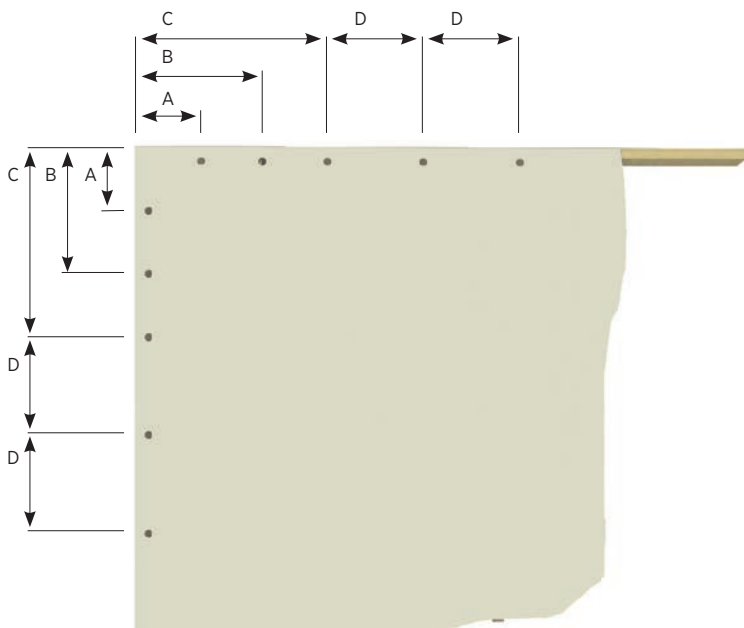
## FIG. 1: UB1FR BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed



## FIG. 2: UB1FR CORNER FIXING DETAILS

Each corner of the bracing element



### 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.



# USG BORAL WALL BRACING SYSTEM UB2FR

USG Boral Bracing Systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UB2FR bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB2FR - PERFORMANCE			
<b>UB2FR</b>	13mm FIBEROCK Aqua-Tough installed vertically on both sides		
	Bracing element wall lengths	0.4–1.2m	1.2m–2.4m
	Bracing units/metre – Wind	115	150 <sup>#</sup>
	Bracing units/metre – Earthquake	130 <sup>#</sup>	150 <sup>#</sup>

<sup>#</sup>Refer to maximum ratings for concrete and timber floors in the Summary Table p3.

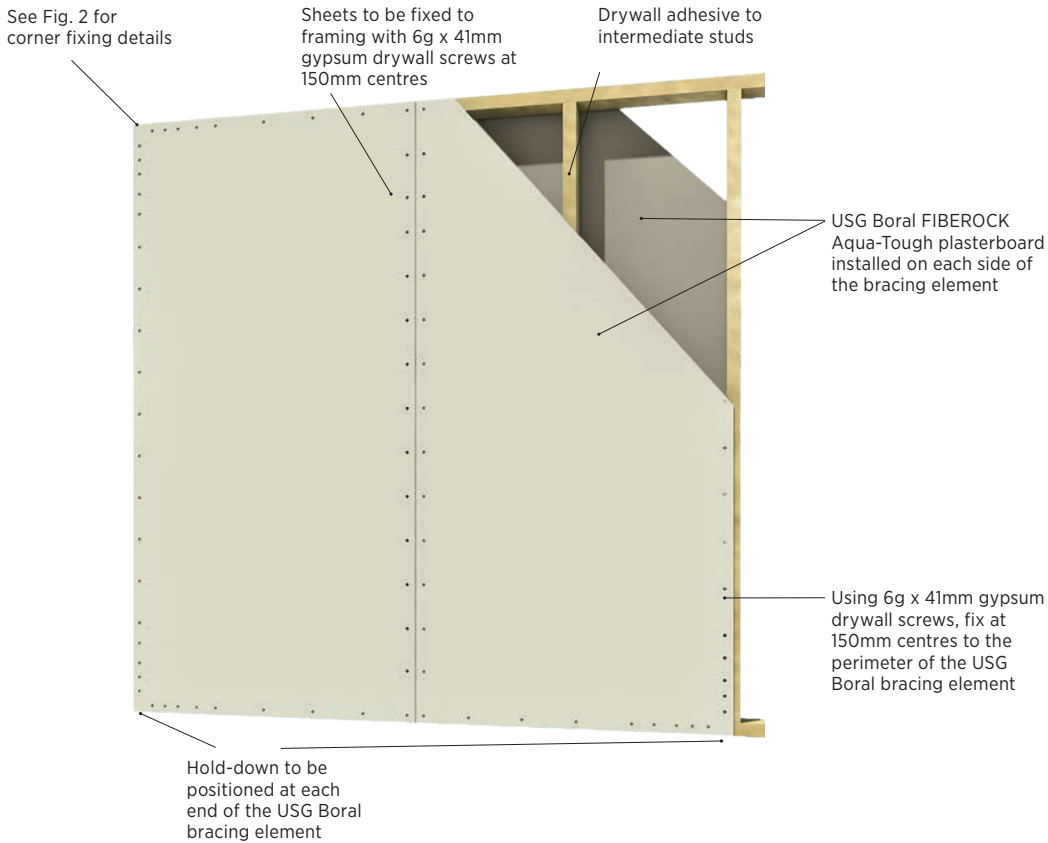
USG BORAL SYSTEM UB2FR - COMPONENTS	
USG Boral lining type	13mm FIBEROCK Aqua-Tough on both sides*
Fasteners	6g x 41mm coarse-threaded gypsum screws for timber substrate
Hold-down anchors	Yes
Hold-down brackets or straps	Yes
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. See current NZS 3604:2011, Section 8
Jointing plaster	USG Boral range
Note: It is not permitted to use nails or adhesive to replace fasteners.	

USG BORAL SYSTEM UB2FR - SPECIFICATIONS	
USG Boral lining type	The following USG Boral lining is permitted for use with the USG Boral UB2FR bracing system. • 13mm FIBEROCK Aqua-Tough*
Fasteners	6g x 41mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. For corner fixing details refer to Fig. 2.
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 galvanized 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	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of SG8. 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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum wall length 400mm	The minimum permitted wall length of the UB2FR bracing system must not be less than 400mm.
Maximum wall length 2400mm	The maximum permitted wall length of the UB2FR bracing system must not exceed 2400mm.
Wall height other than 2.4m	Wall heights as determined by the current NZS 3604:2011. Bracing rating to be determined by the following calculation:  Adjusted rating = $\left( \frac{2.4m}{\text{Actual wall height}} \right) \times \text{the bracing value}$

\* Refer to page 26 for Plasterboard Allowable Substitution Table.

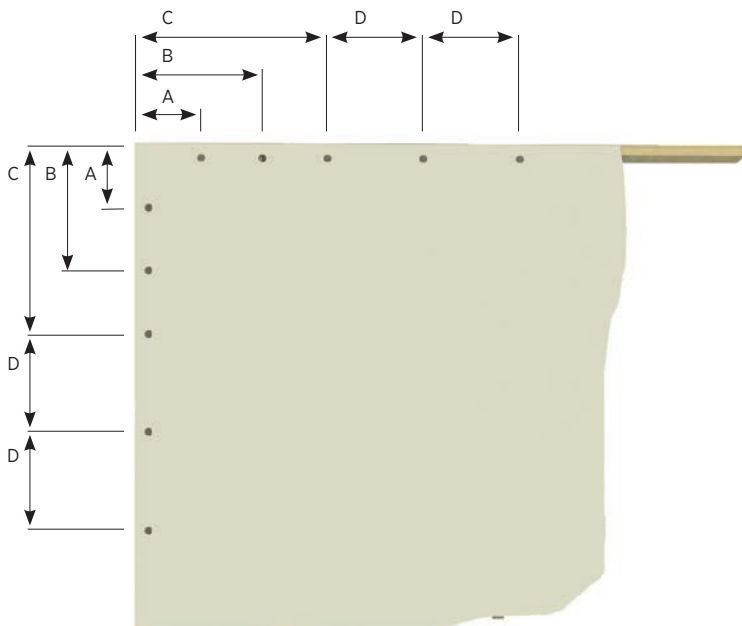
## FIG. 1: UB2FR BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed



## FIG. 2: UB2FR

Each corner of the bracing element



### 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.

# USG BORAL WALL BRACING SYSTEM UBFRP

USG Boral Bracing Systems have been tested in accordance with the P21 (2010) racking test procedure and the current NZS 3604:2011. Detailed in the tables below are the performance values of the USG Boral UBFRP bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral Bracing Systems, the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UBFRP – PERFORMANCE			
<b>UBFRP</b>	13mm FIBEROCK Aqua-Tough installed vertically on one side and 7mm DD structural plywood on the other side		
	Bracing element wall lengths	0.4–1.2m	1.2m–2.4m
	Bracing units/metre – Wind	105	150 <sup>#</sup>
	Bracing units/metre – Earthquake	150 <sup>#</sup>	150 <sup>#</sup>

<sup>#</sup> Refer to maximum ratings for concrete and timber floors in the Summary Table p3.

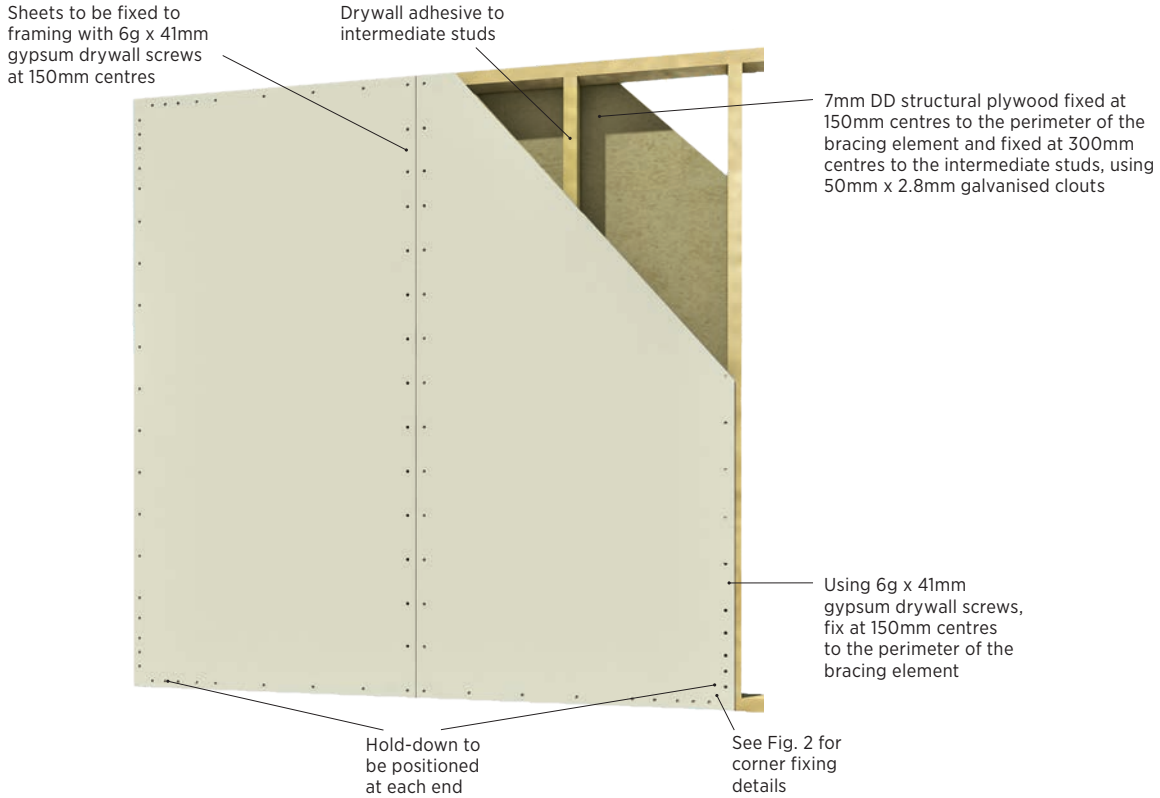
USG BORAL SYSTEM UBFRP – COMPONENTS	
USG Boral lining type	13mm FIBEROCK Aqua-Tough on one side*
Plywood	7mm DD structural plywood on other side
Fasteners - FIBEROCK	6g x 41mm coarse-threaded gypsum screws for timber substrate
Fasteners - Plywood	50mm x 2.8mm galvanised flat head nails
Hold-down anchors	Yes
Hold-down brackets or straps	Yes
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. See current NZS 3604:2011, Section 8
Jointing plaster	USG Boral range
Note: It is not permitted to use nails or adhesive to replace fasteners.	

USG BORAL SYSTEM UBFRP – SPECIFICATIONS	
USG Boral lining type	The following USG Boral lining is permitted for use with the USG Boral UBFRP bracing system. • 13mm FIBEROCK Aqua-Tough*
Plywood	7mm DD structural plywood on the other side. Install plywood with 50 x 2.8mm galvanised nails at 150mm centres to the perimeter of each plywood sheet.
Fasteners - FIBEROCK	6g x 41mm coarse-threaded gypsum screws to be installed at 150mm centres to the perimeter of the bracing element. For corner fixing details refer to Fig. 2.
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	A suitable drywall adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS 3604:2011. Minimum framing grade of MSG8. Maximum stud centres 600m
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 to be in accordance with the current AS/NZS 2589. Minimum plaster joint finish to be Level 4.
Minimum wall length 400mm	The minimum permitted wall length of the UBFRP bracing system must not be less than 400mm.
Maximum wall length 2400mm	The maximum permitted wall length of the UBFRP bracing system must not exceed 2400mm.
Wall height other than 2.4m	Wall heights as determined by the current NZS 3604:2011. Bracing rating to be determined by the following calculation:  Adjusted rating = $\left( \frac{2.4m}{\text{Actual wall height}} \right) \times \text{the bracing value}$

\* Refer to page 26 for Plasterboard Allowable Substitution Table.

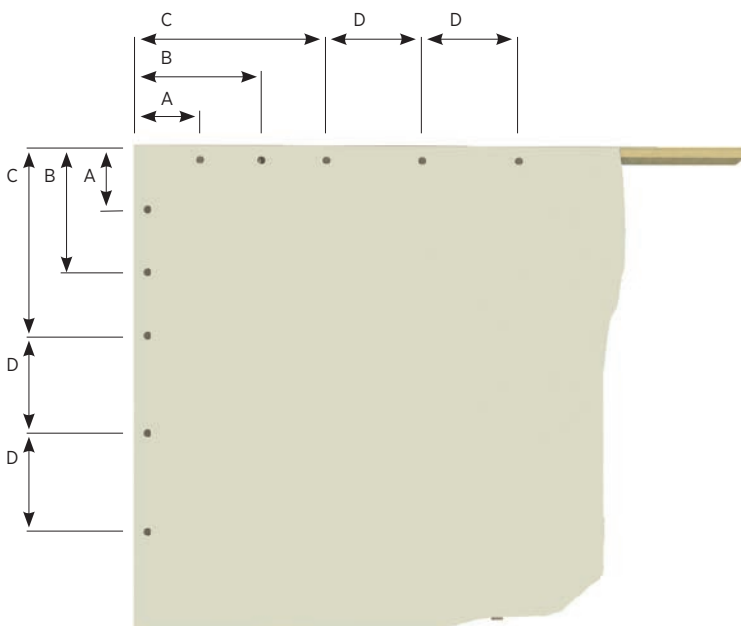
## FIG. 1: UBFRP BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed



## FIG. 2: UBFRP

Each corner of the bracing element



### 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.

# USG BORAL BRACING HOLD-DOWN CONSTRUCTION DETAILS FOR CONCRETE AND TIMBER FLOORS

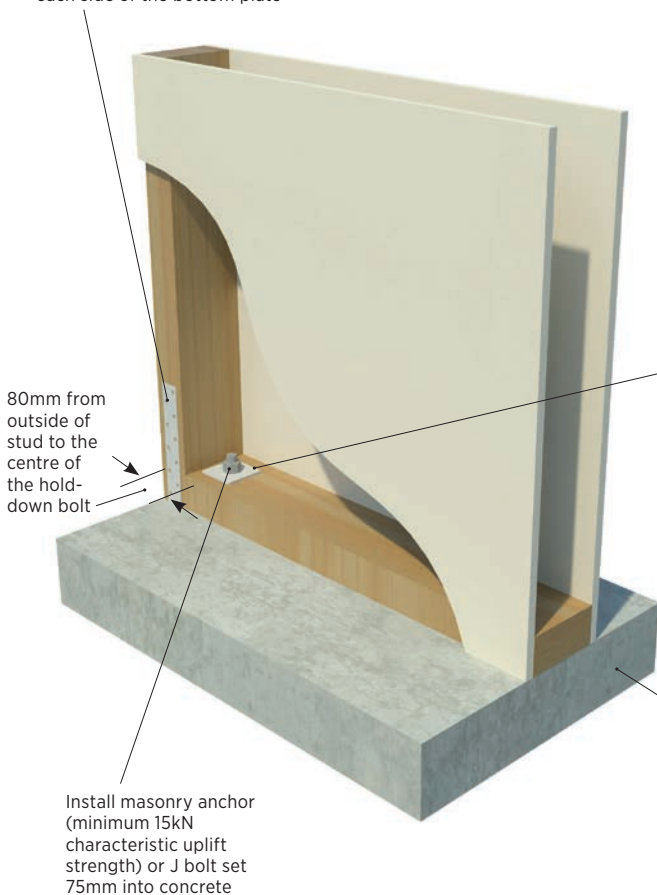
The USG Boral bracing hold-down construction details described in this section are required for USG Boral Bracing Systems UB1FR, UB2FR, UBFPR, UBIM, UBSM, UBMP. However, MULTISTOP systems must only use Pryda brackets.

COMPONENT DESCRIPTION
Masonry hold-down anchor (minimum 15kN characteristic uplift strength)
50 x 50 x 3.0mm galvanised washer
400 x 25 x 0.9mm galvanised or stainless steel strap
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
Pryda Bracing Anchor Bracket can be used in the replacement of the strap

**FIG. 1: INTERNAL WALL ON CONCRETE FLOOR**

Detailed with strap

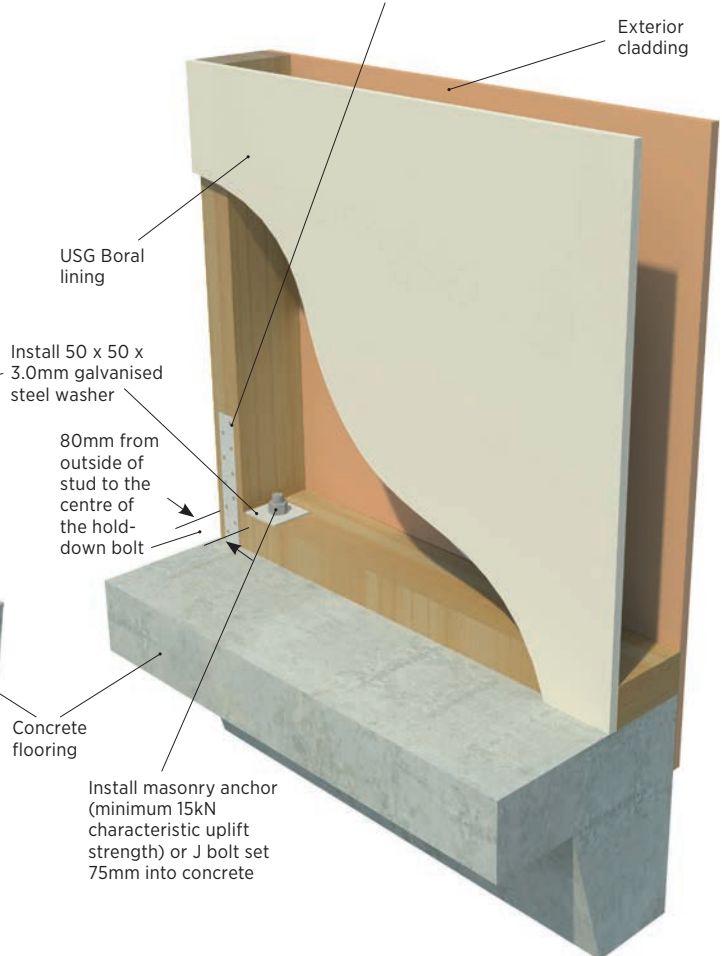
Install 400 x 25 x 0.9mm strap underneath bottom plate and on either side of stud, using 30 x 2.5mm galvanised flat head nails, 6 on each side of the stud and 3 nails on each side of the bottom plate



**FIG. 2: EXTERNAL WALL ON CONCRETE FLOOR**

Detailed with strap

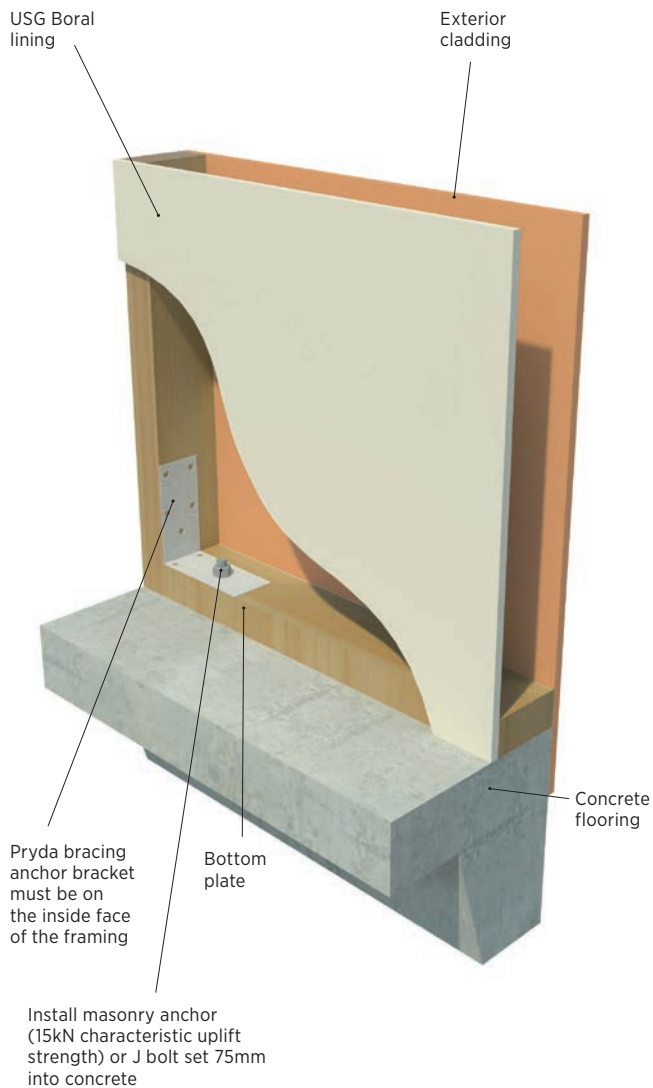
400 x 25 x 0.9mm galvanised strap installed under the bottom plate. Use 30 x 2.5mm galvanised flat head nails to secure the strap, 6 on each side of stud and 3 nails on each side of the bottom plate



## USG BORAL BRACING HOLD-DOWN CONSTRUCTION DETAILS

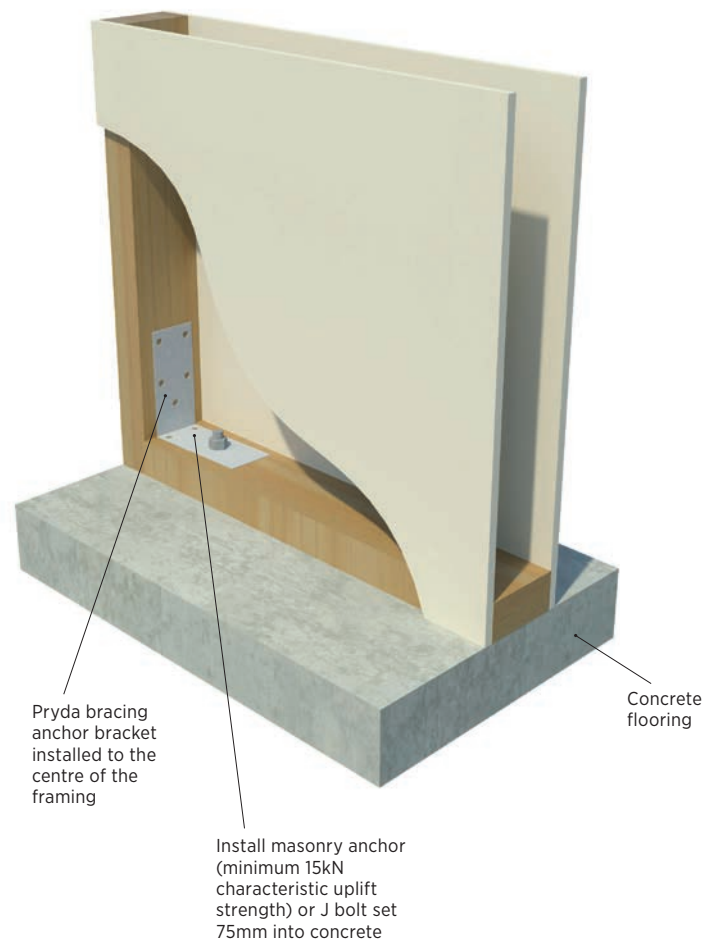
**FIG. 3: EXTERNAL WALL ON CONCRETE FLOOR**

Detailed with the Pryda bracing anchor bracket



**FIG. 4: INTERNAL WALL ON CONCRETE FLOOR**

Detailed with the Pryda bracing anchor bracket

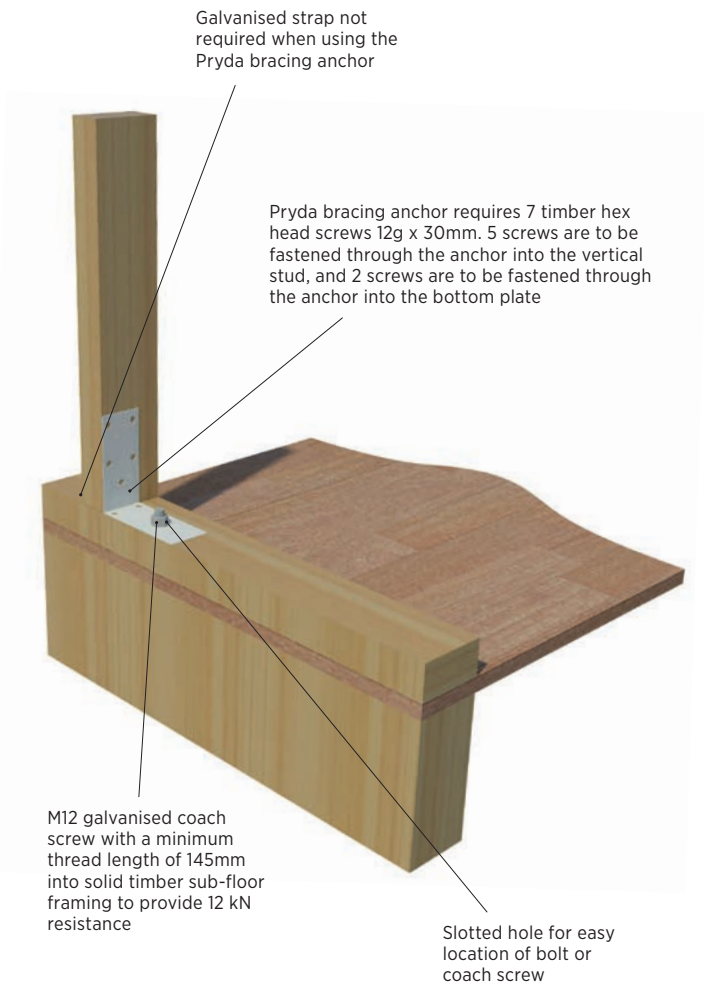


## BRACING HOLD-DOWN CONSTRUCTION DETAILS

**FIG. 5: EXTERNAL WALL ON TIMBER FLOOR**

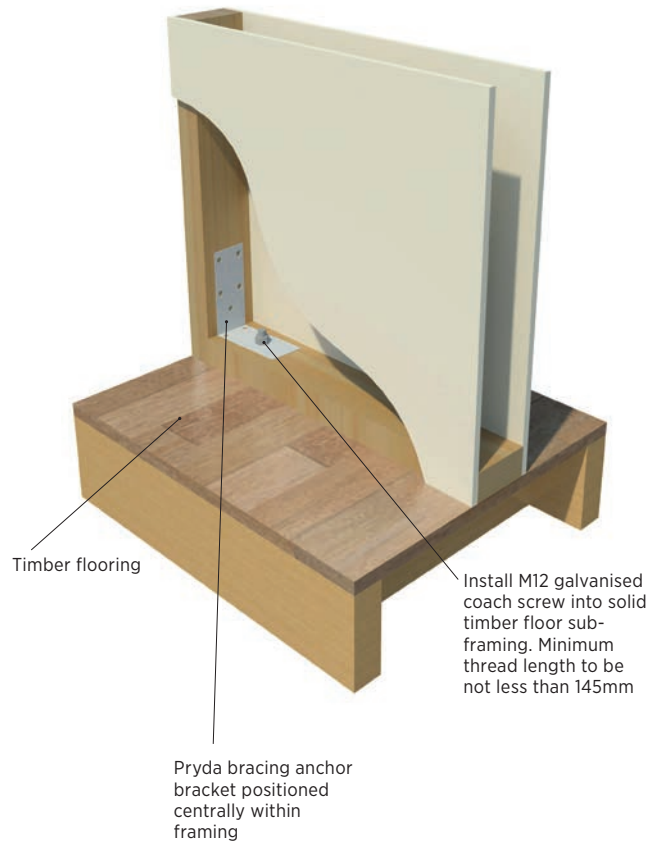
Detailed with Pryda bracing anchor bracket

The Pryda bracing anchor has been developed for both timber and concrete floor connections (timber floor shown below). 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.



**FIG. 6: INTERNAL TIMBER FLOOR**

Detailed with Pryda bracing anchor bracket



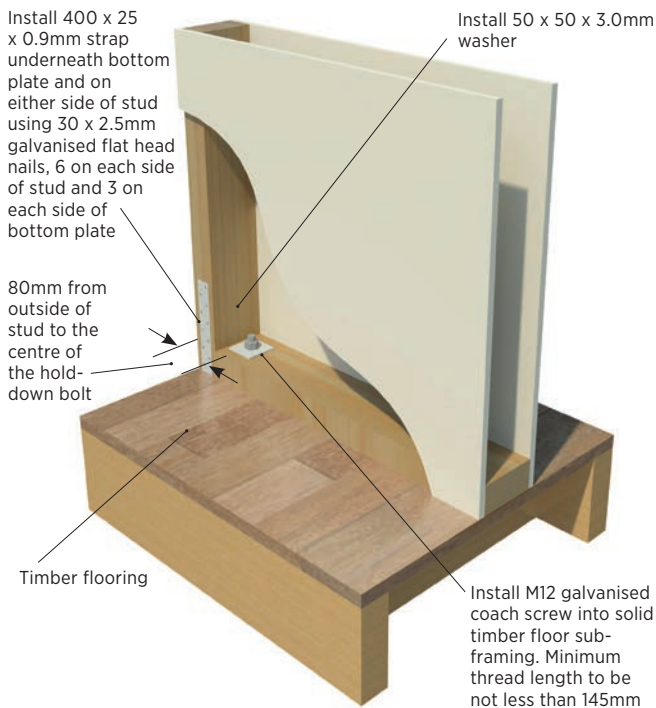


# USG BORAL BRACING HOLD-DOWN CONSTRUCTION DETAILS FOR CONCRETE AND TIMBER FLOORS AND TOP PLATE CONNECTIONS

COMPONENT DESCRIPTION
Hold-down bolts, M12 x 190mm galvanised coach screw (12kN characteristic uplift strength)
50 x 50 x 3.0mm galvanised washer
400 x 25 x 0.9mm galvanised strap
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
Bracing anchor bracket can be used in the replacement of the strap

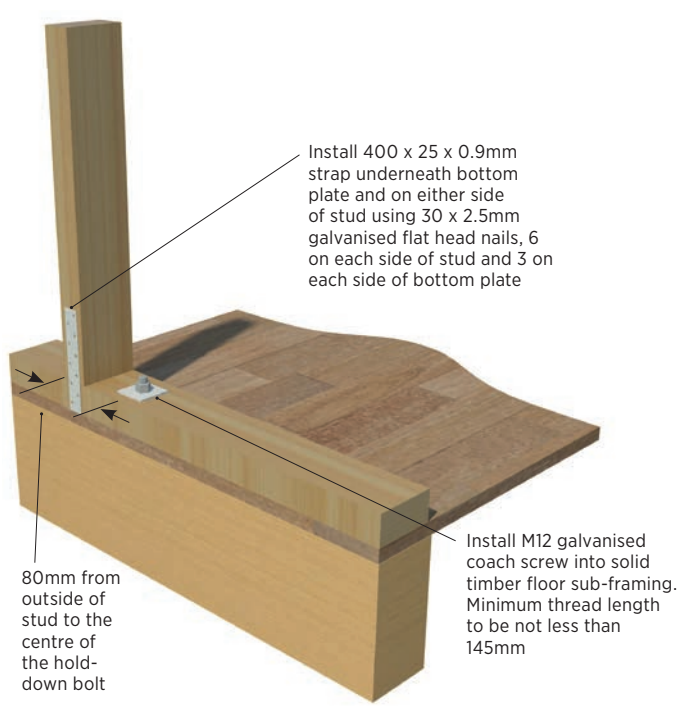
**FIG. 7: INTERNAL TIMBER FLOOR**

Detailed with strap



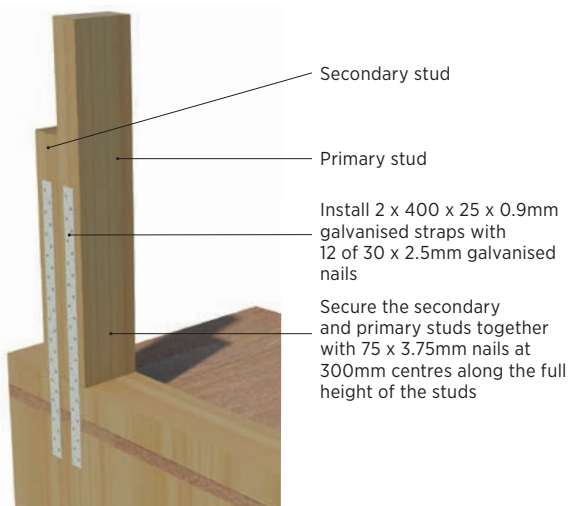
**FIG. 8: EXTERNAL TIMBER FLOOR**

Detailed with strap



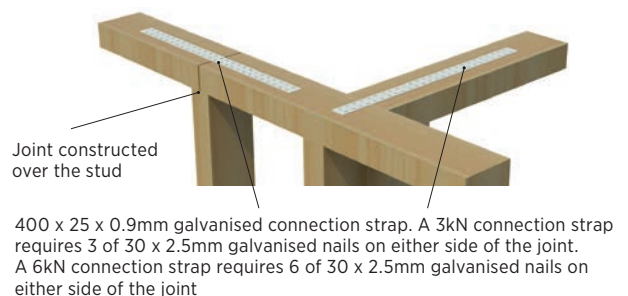
**FIG. 9: TIMBER FLOOR EXTERNAL WALL**

Detailed with double studs and double straps



**FIG. 10: TOP PLATE CONNECTIONS IN BRACING ELEMENTS**

The installation of all top plate connections for bracing elements must be in accordance with NZS 3604 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.



# USG BORAL BRACING SYSTEMS CEILING DIAPHRAGMS

## CEILING DIAPHRAGMS – INSTALLATION INSTRUCTIONS

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

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

As per NZS 3604:2011, a ceiling diaphragm shall be square or rectangular in shape and its length must not be greater than twice its width.

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 26.

The entire area of the ceiling diaphragm must be covered with sheet linings. The installation of the sheet linings is to be carried out as described in the USG Boral Plasterboard Installation Manual.

## THE MINIMUM PLASTERBOARD 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.

CEILING DIAPHRAGM PERFORMANCE							
USG BORAL LINING TYPE	LINING THICKNESS	WEIGHT kg/m <sup>2</sup>	DENSITY kg/m <sup>3</sup>	MAXIMUM LENGTH	FASTENER CENTRES	BATTEN CENTRES	MAX PITCH
MULTISTOP	10.0mm	9.7*	970	7.5m	150mm	600mm	15°
MULTISTOP	13.0mm	11.8*	907				
FIBEROCK Aqua-Tough	13.0mm	12.0*	923				

\*Weights indicated are nominal.

Ceiling diaphragms must be directly connected to bracing lines that have a capacity of not less than 15BU/m. This table details the minimum fasteners permitted for installing USG Boral Plasterboard sheets to ceiling diaphragms.

PLASTERBOARD FASTENERS				
USG BORAL LINING TYPE	LINING THICKNESS	WEIGHT kg/m <sup>2</sup>	FASTENER TYPE & SIZE	
			Timber batten	Steel batten
MULTISTOP	10.0mm	9.7*	Gypsum 32 x 6g coarse thread	Gypsum 25 x 6g fine thread
MULTISTOP	13.0mm	11.8*		
FIBEROCK Aqua-Tough	13.0mm	12.0*		
It is not permitted to use nails or adhesive to replace fasteners.				

Where a second layer of plasterboard is to be installed, the first layer is to be installed as the ceiling diaphragm.

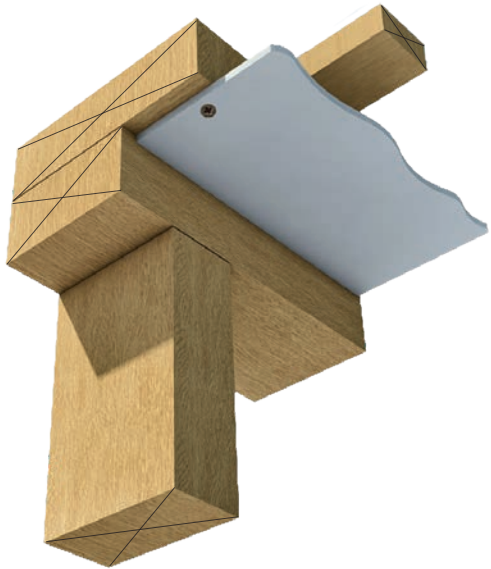
## CEILING DIAPHRAGMS

Plasterboard linings that are not less than 10mm in thickness and have a density of not less than 600 kg/m<sup>3</sup> can be used in ceiling diaphragms that do not exceed 7.5m in length and do not have roof pitch greater than 15° to the horizontal.

# CEILING DIAPHRAGM CONSTRUCTION DETAILS

## CEILING DIAPHRAGM/WALL CONNECTION CONSTRUCTION - TIMBER BATTEN

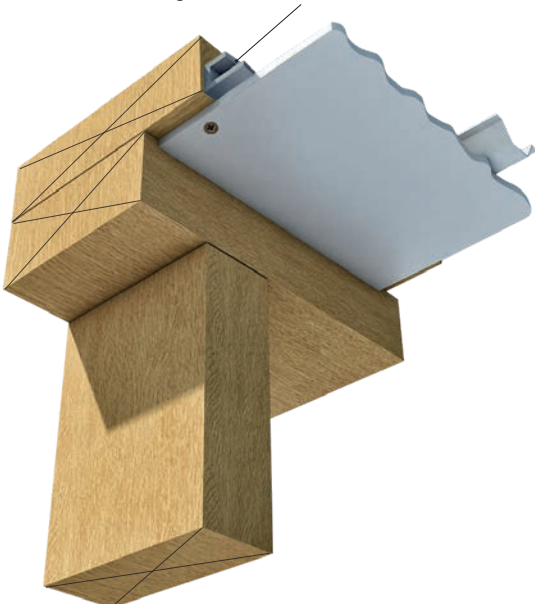
Timber ceiling batten wall connection - continuous  
150 x 35mm ribbon plate



## CEILING DIAPHRAGM WALL CONNECTION - USG BORAL SHEETROCK® CEILING BATTEN

PC24 - Perimeter channel  
FC37 - Ceiling batten

Install PC24 perimeter channel using  
8g 12 x 25mm wafer head screws

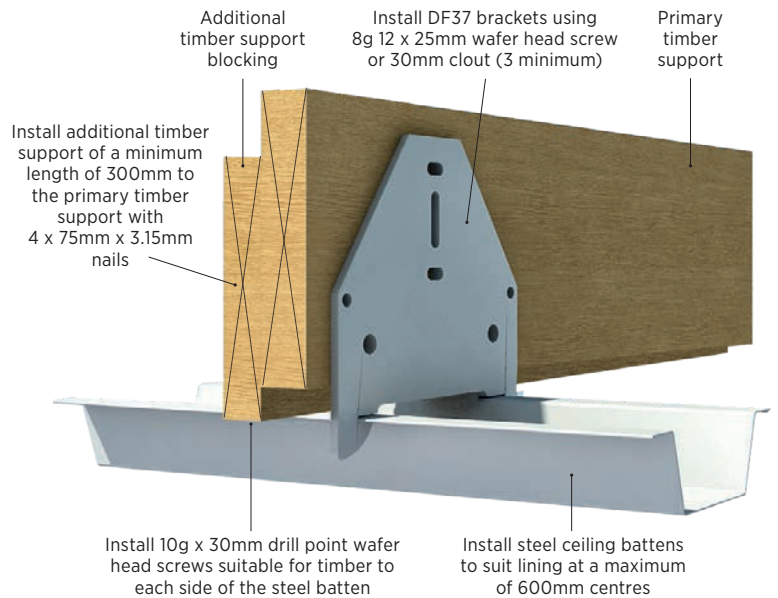


## DIRECT FIX BRACKET INSTALLATION FOR CEILING DIAPHRAGMS

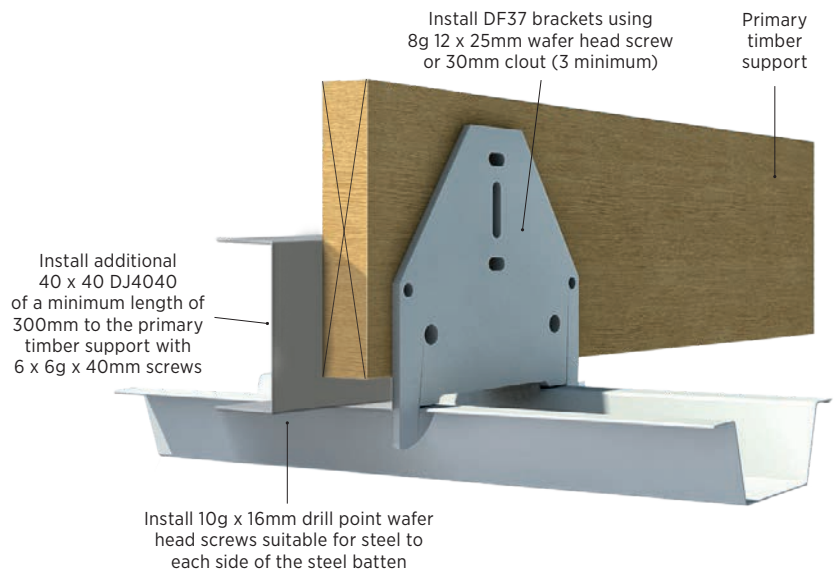
For ceiling diaphragm installations that use steel battens and direct fix brackets, a solid fixing at a maximum 600mm centres to the floor or ceiling framing is required. Refer to the following construction details.

### TIMBER SUPPORT BLOCKING

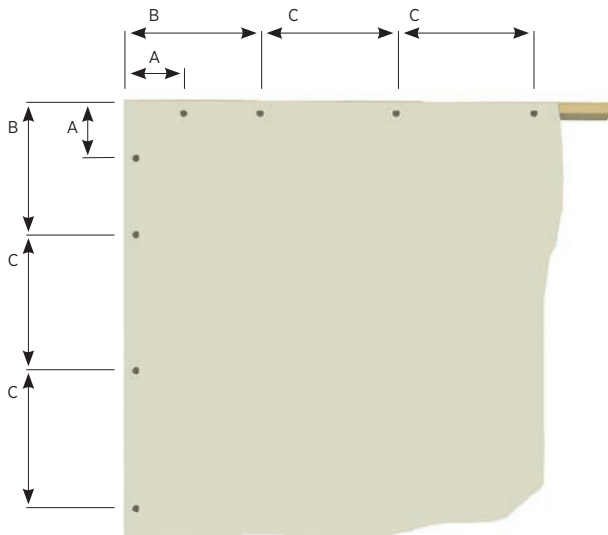
DF37-S Direct fix bracket  
DF37-L Direct fix bracket  
FC37 - Ceiling batten



### STEEL SUPPORT BLOCKING



## CEILING DIAPHRAGM CORNER FIXING DETAIL



### 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.

## 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

USG BORAL PLASTERBOARD ALLOWABLE SUBSTITUTIONS											
USG BORAL BRACING PLASTER BOARD	FIBEROCK		FIRESTOP		SOUNDSTOP		MULTISTOP			SHEETROCK	
	13mm	16mm	13mm	16mm	10mm	13mm	10mm	13mm	16mm		13mm
10mm SHEETROCK <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>2</sup>	✓	✓ <sup>2</sup>	✓	✓	✓	✓	✓	✓ <sup>2</sup>	✓
10mm MULTISTOP	✓ <sup>1</sup>	✓ <sup>2</sup>								✓ <sup>2</sup>	
13mm FIBEROCK		✓ <sup>2</sup>									

<sup>1</sup> Use 41 x 6g screws

<sup>2</sup> Use 51 x 7g screws

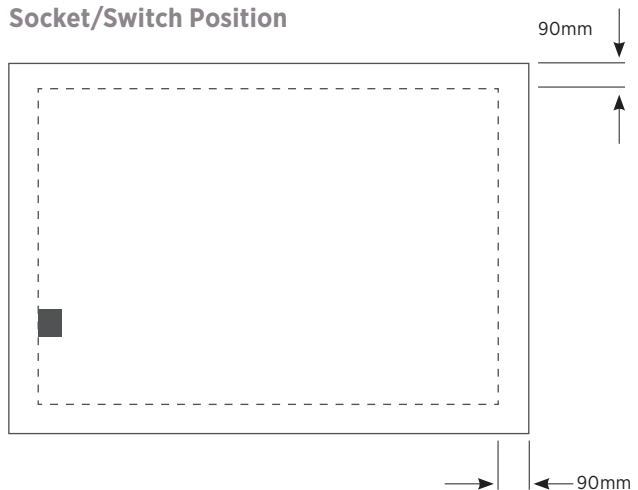
## PENETRATIONS IN BRACING ELEMENTS

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

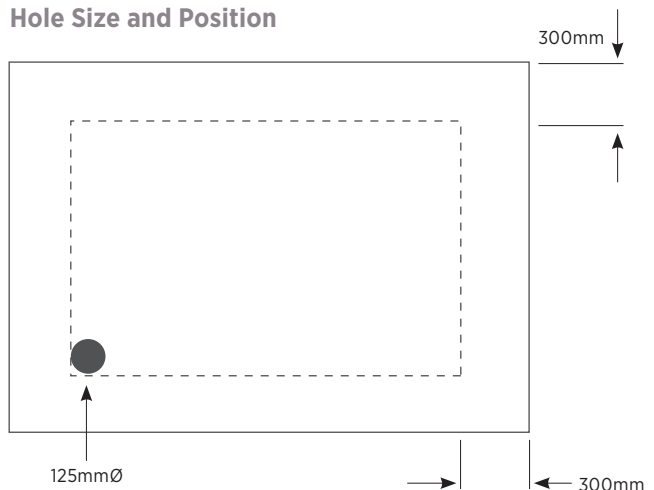
- Socket outlets – 90 x 90mm (maximum) socket outlet penetrations are to be positioned not less than 90mm from the perimeter of the bracing element.
- Switch outlets – 90 x 90mm (maximum) switch outlet penetrations are to be positioned not less than 90mm from the perimeter of the bracing element.
- Penetration holes – 125mmØ (maximum) hole penetrations are to be positioned not less than 300mm from the perimeter of the bracing element.

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

### Socket/Switch Position



### Hole Size and Position



# INFORMATION

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## WARRANTY

USG Boral warrants its products for 10 years from the date of supply of the product. Refer to the USG Boral Warranty document for warranty conditions.

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## SUSTAINABILITY

USG Boral aims to minimise the environmental impact of its operations and to make a positive difference to the environment and communities in which it operates. Plasterboard is manufactured from abundant natural gypsum resources and 100% recycled paper liner.

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## HEALTH & SAFETY

For information regarding the safe use of USG Boral products and accessories, please refer to instructions on the product packaging or contact your local USG Boral Sales Office for a current copy of the Material Safety Data Sheet.

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## TECHNICAL ENQUIRIES 0800 USGBORAL

USG Boral provides free technical advice to builders, architects, contractors, engineers, regulators and home owners throughout New Zealand & Australia.

USG Boral can be contacted on weekdays 8.30am–5.00pm on **0800 USGBORAL (0800 874 267)**.

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## SALES ENQUIRIES

Auckland (09) 930-9182

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Christchurch (03) 595-1542

## USGBoral.com

This Technical Information Guide is intended to provide general information and should not be used as a substitute for professional advice. There are many variables that can influence construction projects which affect whether a particular construction technique is appropriate. Before proceeding with any project, we recommend you obtain professional advice to ascertain the appropriate construction techniques to suit the particular circumstances of your project, having regard to the contents of this Installation Manual. We recommend you use qualified tradespersons to install this system.

The technical information contained in this manual was correct at the time of printing. Building systems, details and product availability are, however, subject to change. To ensure the information you are using is current, USG Boral recommends you review the latest building information available on the USG Boral website. For further information contact TecASSIST® or your nearest USG Boral Sales Office.

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