CBI 5113.
June 2011.

GIB EzyBrace® Systems


Kemp House

www.gib.co.nz

GIB®

GIB EzyBrace® Systems Update

December 2014

SUMMARY OF AMENDMENTS

- The GIB EzyBrace® design software has been updated to address a number of Microsoft Excel related issues and to be even more user-friendly. Download the latest software free from www.gib.co.nz/design/bracing-calculator.
- The Wind BU rating for short BLP-H bracing elements has been reduced to reflect P21 2010 analysis criteria relating to serviceability. This reduction does not affect the ultimate strength of short BLP-H panels previously incorporated.
- The bottom plate anchor placement for use with stud-to-plate straps has been reduced to a maximum of 80mm from the end of the bracing element.
- GIB EzyBrace® Systems and software have been independently appraised by BRANZ Appraisal No. 294.

These amendments result from customer feedback and ongoing Quality Assurance monitoring of GIB® Performance Systems, including the annual BRANZ Appraisal review.

Buildings designed, consented and built using GIB EzyBrace® Systems 2011 prior to these amendments remain in compliance with the relevant NZ Building Code requirements.

GIB EZYBRACE® SOFTWARE

The publication 'GIB EzyBrace® Systems 2011' contains bracing calculation sheets for designers wishing to copy them and carry out calculations manually. For ease of use and significantly increased efficiencies, it is strongly recommended that designers download and use the latest GIB EzyBrace® design software. This software complies with NZS 3604:2011 and contains the latest GIB EzyBrace® Systems information. Bracing calculations can be completed, printed and attached to consent documentation. Alternatively, electronic submissions can be emailed to Building Consent Authorities.

Once completed, bracing calculations can be electronically filed and are easily retrieved and modified should changes be required at a later stage.

This update aims to fix Microsoft issues that have arisen relating to drop-down boxes in certain print configurations.

Early 2015 we will launch a new stand-alone and even more user-friendly software package. Watch this space.

BRACING RESISTANCE BLP-H (MINIMUM 0.4M)

The Wind BU rating for short BLP-H bracing elements has been reduced from 135 BU/m to 120 BU/m to reflect P21-2010 analysis criteria relating to serviceability. This reduction only relates to short BLP-H panels installed on concrete slabs and does not affect ultimate panel strength values.

Type	Minimum Length (m)	Lining	Other Requirements	BU/m		
				W		EQ
				Old	New	Unchanged
BLP-H	0.4	GIB Braceline® one side plywood the other	Panel hold-down fixings	135*	120	135*

* Timber Floors – A limit of 120 BU/m for NZS 3604:2011 timber floors applies unless specific engineering ensures that uplift forces generated by elements rated higher than 120 BU/m can be resisted by floor framing.

BRANZ Appraised
Appraisal No.294 [2011]

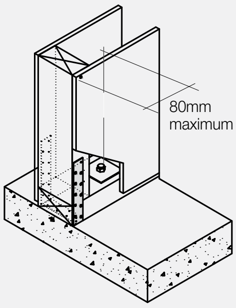
GIB®

BOTTOM PLATE ANCHOR PLACEMENT

When using stud to plate straps the bottom plate anchor placement has been reduced from a maximum of 100mm to 80mm from the end of the bracing element. This distance is consistent with the bolt location in the GIB HandiBrac® and ensures performance equivalence when GIB HandiBrac® and strap fixings are compared. The change represents industry best practice and does not affect previous bracing designs and installations.

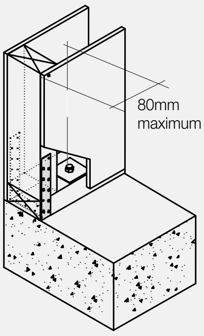
CONCRETE FLOOR

Internal wall



GEB006

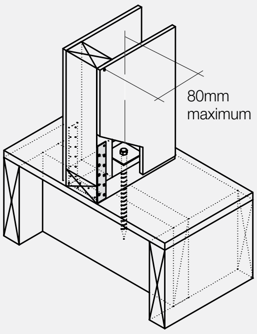
External wall



GEB008

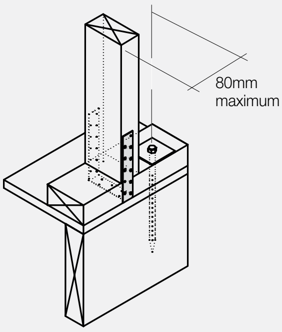
TIMBER FLOOR

Internal wall



GEB007

External wall



GEB009

GIB HandiBrac®

The GIB HandiBrac® has been designed and tested by Winstone Wallboards and remains the preferred panel hold-down fixing for use with high performance GIB EzyBrace® Systems. The registered design bracket is fitted inside the framing and provides a flush surface for wall-lining.

GIB EzyBrace® software and technical literature available at gib.co.nz/gib-ezybrace-systems.

FOR TECHNICAL ASSISTANCE CALL THE
GIB® HELPLINE ON 0800 100 442.

GIB EzyBrace® Systems, June 2011

Winstone Wallboards Ltd accepts no liability if GIB EzyBrace® Systems are not used in accordance with instructions contained in this publication.

Use Only the Current Specification

This publication may be superseded by a new publication. Winstone Wallboards Ltd accepts no liability for reliance upon publications that have been superseded. Before using this publication check whether this is the current publication; simply call the GIB® Helpline on 0800 100 442 or visit www.gib.co.nz.

Substitution

Winstone Wallboards accepts no liability if the systems are not installed in accordance with instructions contained in the GIB® technical literature. Substitution of specified or recommended components with alternative brands can compromise performance dramatically. GIB® systems are not generic and must be installed as specified including the use of GIB® branded components.

Acknowledgements

© Copyright Standards New Zealand 2011. Content reproduced from NZS 3604:2011 *Timber-framed buildings* is reproduced by Winstone Wallboards Limited with permission from Standards New Zealand under Licence 848.

To purchase a copy of NZS 3604:2011 go to www.standards.co.nz.

BRANZ Appraised

Appraisal No.294 [2011]

GIB EzyBrace® Systems, 2011

Front cover image kindly supplied by the New Zealand Historic Places Trust.

Table of Contents

JUNE 2011

Page

Changes to GIB EzyBrace® Systems 5
Sustainability and the Environment 5
Introduction 6
Scope of Use
Compliance with the New Zealand Building Code (NZBC)
How to use this Document

DESIGN

Bracing Demand 7
Wall and Sub-floor Cladding Weights
Roof Cladding Weights
Wind Bracing Demand
Earthquake Bracing Demand
Providing Bracing Resistance – General Guidelines
GIB EzyBrace® Systems – Specification Numbering System.
Wall Heights other than 2.4m
Wall Bracing Calculation Sheet A 14
Wall Bracing Calculation Sheet B 15
Distribution of Wall Bracing Elements 16

DESIGN AND CONSTRUCTION

Ceiling Diaphragms 17
Limitations for GIB® Plasterboard Ceiling Diaphragms
General Fixing Requirements for GIB® Ceiling Diaphragms
Battens
Design and Construction 19
GIB® Plasterboard Linings
Limitations
GIB EzyBrace® Systems in Water-Splash Areas
Renovation
Openings in Bracing Elements
Framing

CONSTRUCTION

Bottom Plate Fixing 21
Panel Hold-down Details 21
Construction Details 23
GIB EzyBrace® System Specification – GS1-N 25
GIB EzyBrace® System Specification – GS2-N 26
GIB EzyBrace® System Specification – GSP-H 27
GIB EzyBrace® System Specification – BL1-H 28
GIB EzyBrace® System Specification – BLG-H 29
GIB EzyBrace® System Specification – BLP-H 30

Changes to GIB EzyBrace® Systems

JUNE 2011

What is new?

The new GIB EzyBrace® bracing systems and software comply with NZS 3604:2011. The design process to determine Wind and Earthquake bracing demand has been changed to reflect NZS 3604:2011 requirements which are now based on loadings code AS/NZS 1170. Bracing unit values have been derived using the updated BRANZ P21(2010) wall bracing test and evaluation procedure.

Design

- New NZS 3604:2011 compliant processes to determine Wind and Earthquake bracing demand.
- New NZS 3604:2011 compliant wall bracing distribution rules.

GIB EzyBrace® Bracing Systems

- Further simplified GIB EzyBrace® Bracing Systems.
- All systems start at 400mm length (excluding when GIB® Aqualine is substituted into a BL system).
- Bracing tables for 10 and 13mm GIB® Plasterboard lining thicknesses have been amalgamated.
- A single fastener pattern for all GIB EzyBrace® Bracing Systems.
- GIB® Grabber® 32x6g screws can now be used in BL and GS systems.
- Responsibly conservative and reliable bracing unit ratings.
- Increased allowance for use of new GIB® Standard in ceiling diaphragms.

GIB EzyBrace® Software

- Fully NZS 3604:2011 compliant.
- Permits full design flexibility when entering bracing lines and bracing elements.
- Automatic calculation of minimum distribution requirements per line.
- For software visit www.gib.co.nz.

Sustainability and the Environment

Winstone Wallboards is committed to protecting the environment. Environmental matters are integrated into all business activities:

- All operations of Winstone Wallboards will strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We will allocate appropriate management time and resources to address relevant environmental issues and continuously improve our activities in that area.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

Winstone Wallboards is the first manufacturer of plasterboard to have products certified as environmentally preferable through Environmental Choice New Zealand. The Environmental Choice label acknowledges the product as meeting or exceeding the voluntary environmental declaration standard set by the New Zealand Eco-labelling Trust. The standard is a comprehensive life-cycle assessment which is scientifically and internationally recognised.

The Environmental Choice Label covers all GIB® Plasterboard 13mm and greater in thickness.

Specify GIB® Plasterboard with the Environmental Choice label as this ensures that the product selected minimises the impact on the environment. Consideration should be given to minimising on-site waste when designing and/or installing GIB® Plasterboard systems. For larger projects consideration should be given to the utilisation of Winstone Wallboards cut-to-length service to reduce the volume of waste produced.

GIB® Plasterboard off-cuts, if separated from other waste building materials, can be readily recycled. For larger projects the waste can be diverted to compost manufacturers who grind up the GIB® Plasterboard and use it in compost. For smaller projects, the GIB® Plasterboard can be ground up and spread around the building site.

Introduction

Scope of Use

This document is a guide to wall bracing of buildings constructed in accordance with NZS 3604:2011 Timber Framed Buildings. It is intended for use by owners, architects, engineers, draughtsmen and builders, and designed to help the user to determine a building's wall bracing needs. It explains how to use GIB EzyBrace® Systems to resist wind and earthquake forces.

The information contained in this document is believed to be correct and accurate. However, all due care should be exercised by those who use it. If necessary, appropriate advice should be sought. Winstone Wallboards Ltd accepts no liability if the system is not used in accordance with instructions contained in this literature.

Compliance with the New Zealand Building Code (NZBC)

GIB EzyBrace® Systems comply with the requirements of NZS 3604:2011, when designed and installed in accordance with this brochure. NZS 3604:2011 is an Acceptable Solution to NZBC Clause B1 Structure once referenced.

Under normal conditions of dry internal use GIB EzyBrace® Systems have a service life in excess of 50 years and satisfy the requirements of NZBC Clause B2 Durability.

How to use this Document

This document is a step by step guide through the process of designing a bracing system and filling out a bracing schedule in accordance with NZS 3604:2011.

Although manual calculation is still possible, the use of our GIB EzyBrace® software is recommended as it minimises the potential for error, improves the accuracy of computations, reduces time input and delivers material efficiencies.

External forces (Bracing Units (BUs) required or demand)

Step 1: Work out the required number of **BUs** for **wind**

↓

Step 2: Work out the required number of **BUs** for **earthquake**

The structure's resistance (Bracing Units (BUs) achieved or capacity)

Step 3: Ensure adequate distribution of **wall bracing elements**

↓

Step 4: Work out the achieved number of **BUs** for **wind**

↓

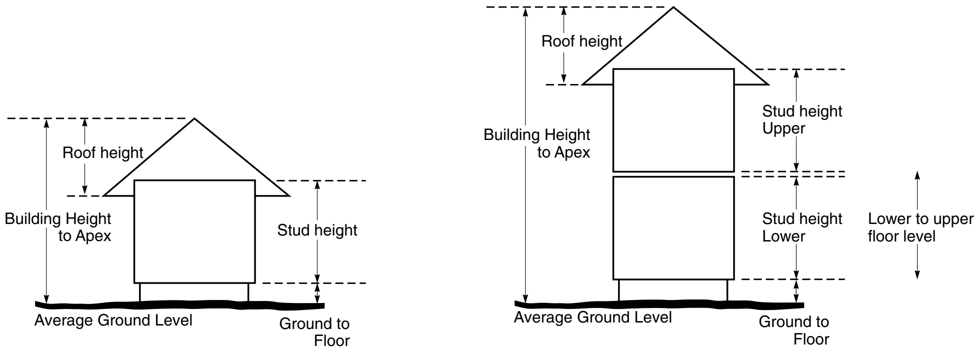
Step 5: Work out the achieved number of **BUs** for **earthquake**

Further Information

Download a free copy of the GIB EzyBrace® 2011 software from www.gib.co.nz.

For training needs contact the GIB® Helpline on 0800 100 442.

Dimensions



Wall and Sub-floor Cladding Weights

Heavy — A cladding having a mass exceeding 80 kg/m² but not exceeding 220 kg/m² (typical examples are clay or concrete masonry veneers).

Medium — A cladding having a mass exceeding 30 kg/m² but not exceeding 80 kg/m² (a typical example is stucco cladding)

Light — A cladding having a mass not exceeding 30 kg/m² (typical examples are timber or fibre-cement weatherboards)

Roof Cladding Weights

Heavy — Roofing material (cladding and sarking) having a mass exceeding 20 kg/m² but not exceeding 60 kg/m² (typical examples are concrete tiles and slates)

Light — Roofing material (cladding and sarking) having a mass not exceeding 20 kg/m² (a typical example is metal roofing of normal thickness)

Wind Bracing Demand

For detailed information consult NZS 3604:2011.

Wind Zone

Many Building Consent Authorities have wind zone maps prepared to assist designers. Contact your local authority for further information. This information is a guide only. The wind zone can be determined more accurately by following the procedure outlined in Table 5.1 from NZS 3604:2011.

Table 5.1 – Procedure for determination of wind zones

Steps	Action	Reference	Values available
1	Determine wind region	Figure 5.1	A, W
2	Determine if in a lee zone	Figure 5.1	See table 5.4
3	Determine ground roughness	5.2.3 (NZS 3604:2011) see page 6	Urban terrain Open terrain
4	Determine site exposure	5.2.4 (NZS 3604:2011) see page 7	Sheltered / exposed
5	Determine topographic class	From tables 5.2, 5.3 and figure 5.2	Gentle to steep
6	Determine wind zone	Table 5.4	L, M, H, VH, EH

Wind region and lee zone

Figure 5.1 from NZS 3604:2011 gives the wind region. Lee zones are shaded and attract higher wind speeds resulting in a higher design wind zone as given in Table 5.4.

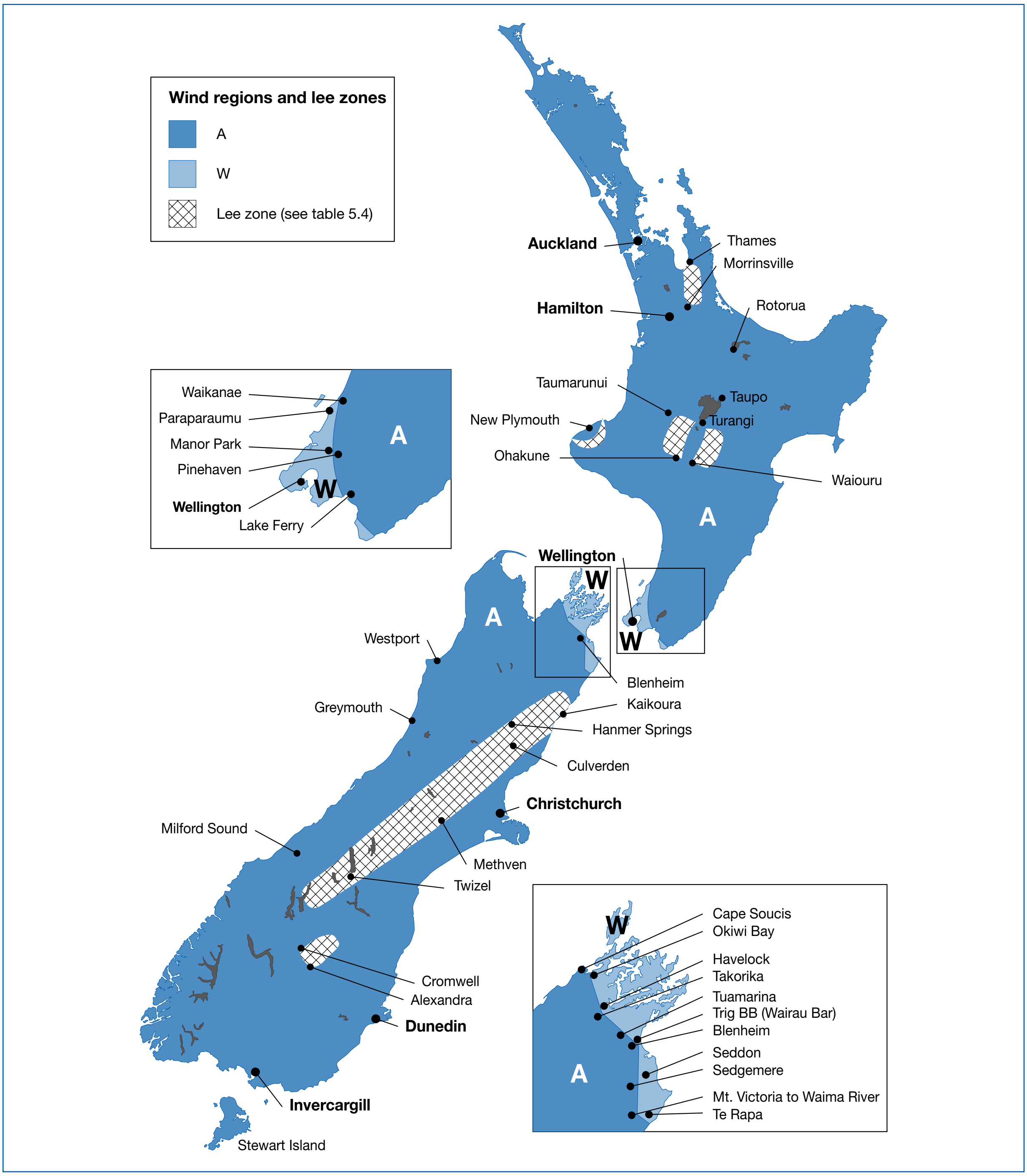


Figure 5.1 – Wind regions and lee zones

Ground roughness

The ground roughness is determined by considering the number, type and height of obstructions over which the wind must pass as it approaches the site. Use the most severe direction to establish the ground roughness for the site.

Urban terrain: more than 10 obstructions, houses or trees more than 3m high, per hectare.

Open terrain: grazed pastures, cropping, or areas adjacent to beaches and the sea or airfields and other areas with isolated trees or shelter.

Sites within a 500m wide fringe of the boundary between urban and open terrain shall be considered open terrain.

Site exposure

Determine the site exposure for a building by assessing the shielding effects of obstructions around the site, for wind from any direction.

Sheltered: At least 2 rows of similarly sized permanent obstructions at the same ground level all around.

Exposed: Steep sites as defined in table 5.2 or sites adjacent to open spaces such as playing fields, beach fronts, large rivers, motorways, or sites adjacent to wind channels greater than 100m in width.

Topographic Class

Follow tables 5.2 and 5.3 to determine the topographic class for the site. The ‘smoothed gradient’ is measured over a horizontal distance from the crest for the lesser of 3 times the height of the hill, or 500 m. It is the change in elevation divided by the relevant distance (h/L).

An escarpment is defined as the region beyond the crest having a slope less than 1:20 (see figure 5.2).

Table 5.2 – Procedure for determination of topographic class, T1 – T4

<table>
<tr><th>Steps</th><th colspan="2">Action</th><th colspan="2">Reference</th><th>Values available</th></tr>
<tr><td>1</td><td colspan="2">Determine hill height and formation</td><td colspan="2">Figure 5.2</td><td>Hill, Escarpment</td></tr>
<tr><td>2</td><td colspan="2">Determine smoothed gradient value and class</td><td colspan="2">Figure 5.2</td><td>Low to Steep</td></tr>
<tr><td>3</td><td colspan="2">Determine topography</td><td colspan="2">Figure 5.2</td><td>Crest / Outer</td></tr>
<tr><td>4</td><td colspan="2">Determine site exposure</td><td colspan="2">As above or 5.2.4
(NZS 3604:2011)</td><td>Sheltered/exposed</td></tr>
<tr><td>5</td><td colspan="2">Determine topographic class</td><td colspan="2">As above and
table 5.3 or 5.2.5
(NZS 3604:2011)</td><td>–</td></tr>
<tr><td>In this table</td><td>Gentle =
Low =
Mild =
Moderate =
Steep =</td><td>Gradient
Gradient
Gradient
Gradient
Gradient</td><td>< 0.05
0.05 < 0.1
0.1 < 0.15
0.15 < 0.2
> 0.2</td><td>i.e. slope max.
i.e. slope max.
i.e. slope max.
i.e. slope max.
i.e. slope max.</td><td>1:20
1:10
1:6.7
1:5
> 1:5</td></tr>
</table>

Table 5.3 – Determination of topographic class

<table>
<tr><th>Topography</th><th>Gentle</th><th>Low</th><th>Mild</th><th>Moderate</th><th>Steep</th></tr>
<tr><td>Crest</td><td>T1</td><td>T2</td><td>T3</td><td>T4</td><td>T4</td></tr>
<tr><td>Outer</td><td>T1</td><td>T1</td><td>T2</td><td>T2</td><td>T3</td></tr>
<tr><td colspan="6">All sites outside the outer and crest zones are topographic class T1 except that:
(1) Sites within valleys which are known to have accelerated wind flows within them because of their shape and exposed mouths shall be classed as T4.
(2) Sites in areas with undulations of less than 10m in height, and gradients less than 1:20 shall be classed as T1.</td></tr>
</table>

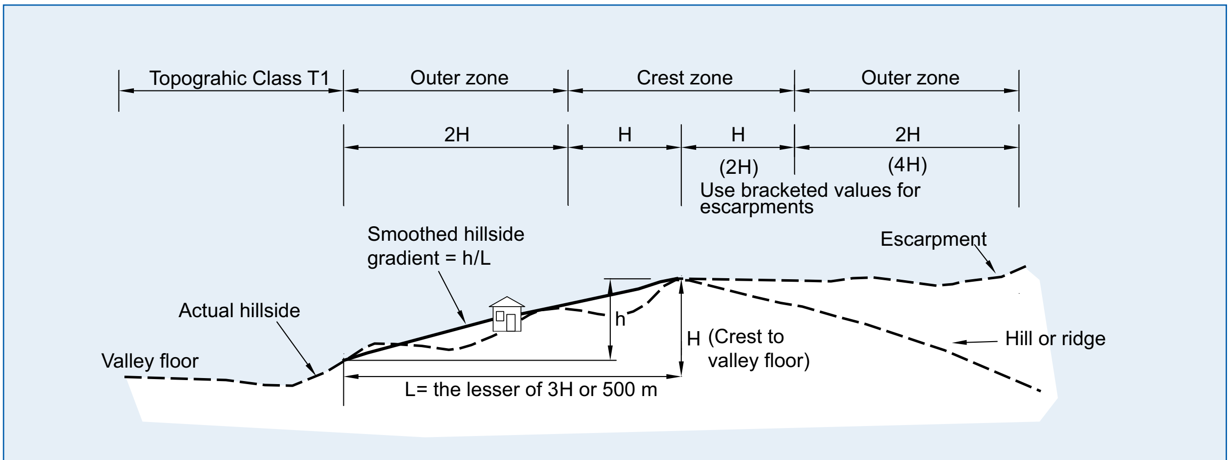


Figure 5.2 – Topography (including escarpment conditions)

Determination of Wind Zone

The wind zone can be determined from Table 5.4 once steps 1 to 5 have been completed. Note that the GIB EzyBrace® software determines the wind zone automatically once these parameters have been entered.

Table 5.4 – Determination of wind zone

Region	Ground roughness	Topographic class and site exposure							
		T1		T2		T3		T4	
		Sheltered	Exposed	Sheltered	Exposed	Sheltered	Exposed	Sheltered	Exposed
A	Urban	L	M	M	H	H	H	H	VH
	Open	M	H	H	VH	H	VH	VH	EH
W	Urban	M	H	H	VH	H	VH	EH	EH
	Open	H	VH	VH	EH	VH	EH	SED	SED

NOTE –
Wind speeds below are the maximum ultimate limit state wind speed for each wind zone.
L = Low wind speed of 32 m/s
M = Medium wind speed of 37 m/s
H = High wind speed of 44 m/s
VH = Very high wind speed of 50 m/s
EH = Extra high wind speed of 55 m/s
SED = Specific engineering design (not covered by this Standard)

Winds in lee zones shall be increased as follows:
Low wind becomes High
Medium wind becomes Very high
High wind, and above become SED

Direction of wind and braced walls

Figure 5.3 shows the wind direction and the location of braced walls to resist wind forces. The braced walls are located parallel to the wind direction and perpendicular to the façade being supported.

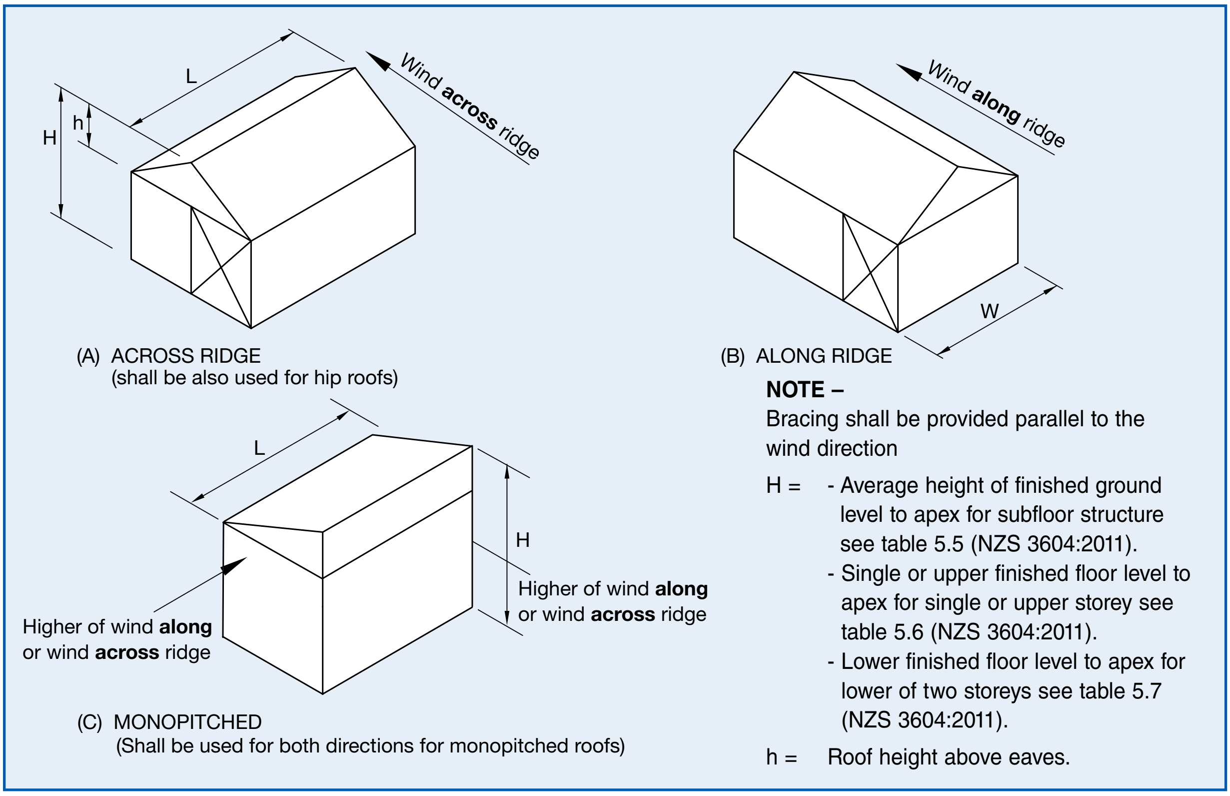


Figure 5.3 – Direction of wind and braced walls

Earthquake Bracing Demand

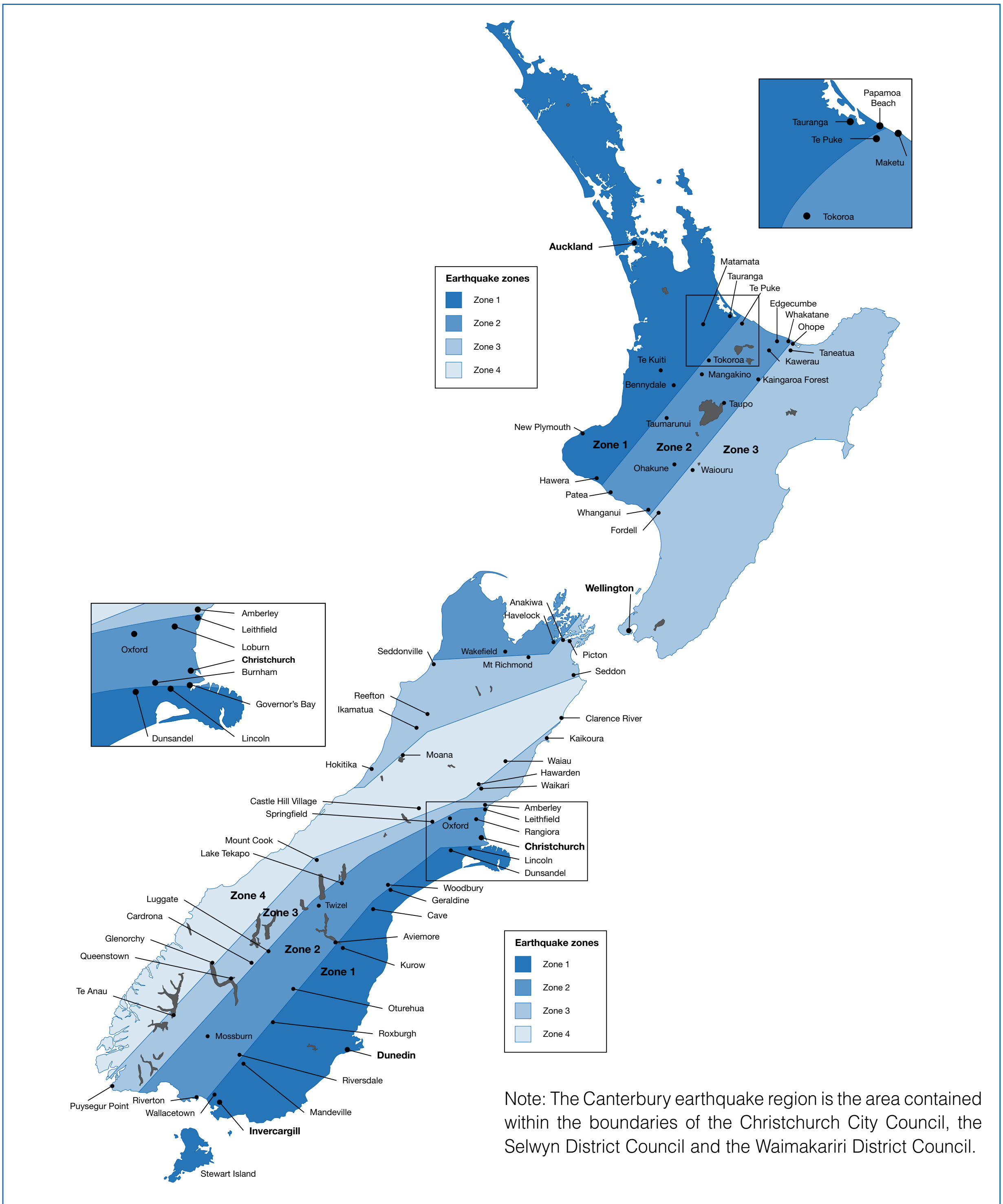
For detailed information consult NZS 3604:2011, tables 5.8, 5.9 and 5.10.

Earthquake Zone

The earthquake zone is determined from NZS 3604:2011 Figure 5.4.

Site subsoil classification

The site subsoil classification shall be selected as Class D/E (deep or soft to very soft soil) unless evidence is provided to verify that Class A or B (rock) or C (shallow soil) may be used.
For further information consult NZS 3604:2011.



Note: The Canterbury earthquake region is the area contained within the boundaries of the Christchurch City Council, the Selwyn District Council and the Waimakariri District Council.

Figure 5.4 – Earthquake zones

Bracing Demand

Additional earthquake bracing demand

Where a building has a concrete masonry lower storey, the bracing demand for the timber framed upper storey is calculated as a single storey building assuming a heavy sub-floor cladding.

Where a part storey is contained in the roof space, up to 50% of the lower floor area, the bracing demand for that lower floor is increased by 4 BUs/m². Note that the GIB EzyBrace® software provides options for smaller roof space developments.

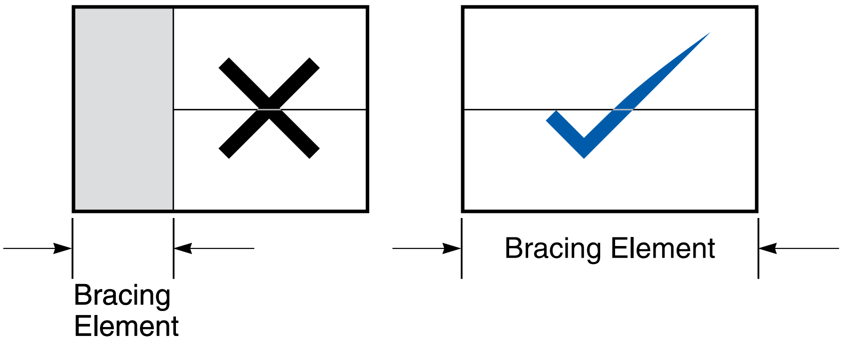
Where a part storey is contained in a timber framed basement, the building is split for bracing calculation purposes into a single and a two storey building.

The bracing demand is increased where a masonry or concrete chimney relies on the structure for lateral support. See NZBC B1/AS3.

Bracing Resistance

Providing Bracing Resistance – General Guidelines

Always use the *maximum available wall length* for bracing purposes by moving the bracing element fasteners out to the perimeter of the wall. This maximises the Bracing Units achieved from a wall section and enhances the quality of finish by having the majority of fasteners at wall ends or in corners. For example, it is inefficient to designate only 1.2 metres of a 3.6 metre wall for bracing purposes.



GIB EzyBrace® Systems – Specification numbering system.

The GIB EzyBrace® specification numbering system is designed to facilitate nomination of GIB EzyBrace® systems by designers and easy identification by builders and building officials on site.

The numbering system and sub-components thereof are protected by copyright.

GS1-N = GIB® Standard plasterboard one side
GS2-N = GIB® Standard plasterboard both sides
GSP-H = GIB® Standard plasterboard / plywood with panel hold-down fixings

BL1-H = GIB Braceline® one side with panel hold-down fixings
BLG-H = GIB Braceline® / GIB® Standard plasterboard with panel hold-down fixings
BLP-H = GIB Braceline® / plywood with panel hold-down fixings

Specifying GIB EzyBrace® Elements (minimum wall length 400 mm)	
Inside lining External Walls	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements.
Internal Walls (only one side available for bracing)	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal Walls (both sides available for bracing)	Nominate available lengths of wall as GS1-N elements. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

Bracing Resistance

Table 1: GIB® Standard Plasterboard Bracing Unit ratings

Type	Minimum Length (m)	Lining	Other Requirements	BU/m	
				W	EQ
GS1-N	0.4	GIB® Standard Plasterboard one side	N/A	50	55
	1.2			70	60
GS2-N	0.4	GIB® Standard Plasterboard both sides	N/A	70	65
	1.2			95	85
GSP-H	0.4	GIB® Standard Plasterboard one side plywood the other	Panel hold-down fixings	100	115
	1.2			150*	150*

Table 2: GIB Braceline® Bracing Unit ratings

Type	Minimum Length (m)	Lining	Other Requirements	BU/m	
				W	EQ
BL1-H	0.4	GIB Braceline® one side	Panel hold-down fixings	90	100
	1.2			125*	105
BLG-H	0.4	GIB Braceline® one side GIB® Standard Plasterboard the other	Panel hold-down fixings	110	115
	1.2			150*	145*
BLP-H	0.4	GIB Braceline® one side plywood the other	Panel hold-down fixings	135*	135*
	1.2			150*	150*

Note: The BU/m ratings for GIB EzyBrace® systems are responsibly conservative. Using the GIB EzyBrace® software will deliver higher ratings than using the manual tables.

** **Timber Floors** – A limit of 120 BU/m for NZS 3604:2011 timber floors applies unless specific engineering ensures that uplift forces generated by elements rated higher than 120 BU/m can be resisted by floor framing.*

Wall Heights other than 2.4m

The published Bracing Unit ratings are based on a 2.4 metre height. For greater heights, the ratings must be multiplied by a factor *f* = 2.4 divided by the actual wall height. The Bracing Unit ratings for walls higher than 2.4 metres will reduce.
For example:
The Bracing Unit rating of a 2.7 metre high wall is obtained by multiplying the values in Tables 1 and 2 by f = 2.4/2.7 = 0.89
The Bracing Unit rating of a 3.6 metre high wall is obtained by multiplying the values in Tables 1 and 2 by f = 2.4/3.6 = 0.67
The height of walls with a sloping top plate can be taken as the average height.
Walls lower than 2.4 metres shall be rated as if they were 2.4 metres high.

Design

Wall Bracing Calculation Sheet A

JUNE 2011

Job Details (tick appropriate boxes)

Box 1

Name			
Street Address			
Lot No		DPS No	
City/Town			

Location of Storey:		*Floor type:*		*Floor load:*	
Single/upper storey		Sub-floor		2kPa	
Upper storey of two		Slab		3kPa	
Lower storey of two					

Key dimensions

Building height to apex			Metres
Roof height above eaves			Metres
Stud height			Metres
Average roof pitch			Degrees
Building Length	BL		Metres
Building Width	BW		Metres
Gross Plan Area	GPA		Sq Metres

Note: When the average roof pitch is over 25 degrees, use the eaves length and width to determine BL and BW

Cladding weight	Light	Medium	Heavy
Sub-floor			
Lower storey			
Upper or Single Storey			

Roof weight	Light	Heavy

Room in roof space	Yes	No

Wind Zone

Box 2

Action	Reference	Values available	Outcome
Wind Region	Figure 5.1	A, W	
Lee Zone	Figure 5.1	Yes, No	
Ground Roughness	Page 6	Urban, Open	
Site Exposure	Page 7	Sheltered, Exposed	
Topographic Class	Tables 5.2 and 5.3 + Fig 5.2	Gentle to Steep	
Wind Zone	Table 5.4	L, M, H, VH, EH, SED	

Earthquake Zone

Box 3

Action	Reference	Values available	Outcome
Earthquake Zone	Figure 5.4	1, 2, 3, 4	
Site subsoil classification	Page 9	A, B, C, D, E	

BUs required Wind

Box 4

W Across			BUs per m
W Along			BUs per m

(From NZS 3604:2011 tables 5.5, 5.6 and 5.7)

Total Wind Load

W Across	Enter BL from box 1	Multiply by	BUs per m Across	Equals Across W required
		X		

W Along	Enter BW from box 1	Multiply by	BUs per m Along	Equals Along W required
		X		

BUs required Earthquake

Box 5

E =		BUs per m^2

(From NZS 3604:2011 tables 5.8, 5.9 and 5.10)

Note: For a room in the roof space use E + 3 BU/m^2

Total Earthquake Load

EQ Requirement Along and Across	Enter GPA from box 1	Multiply by	E	Equals E required
		X		

Transfer to calculation sheet B

For manual calculations only

Wall Bracing Calculation Sheet B

JUNE 2011

Design

Along

WALL OR BRACING LINE		BRACING ELEMENTS PROVIDED			WIND		EARTHQUAKE	
1	2	3	4	5	6 W	7 W	6 E	7 E
Line Label	Minimum BUs Required	Bracing Element No.	Bracing Type	Length Element (m) L	Rating BU/m W	BUs Achieved (BU/m x L) W	Rating BU/m E	BUs Achieved (BU/m x L) E
A								
B								
C								
D								
E								

	Totals Achieved	**W** achieved	**E** achieved
From Sheet A	Totals Required	**W** required*	**E** required*
		W achieved must exceed W required*	E achieved must exceed E required*

* from Calculation Sheet A

Across

WALL OR BRACING LINE		BRACING ELEMENTS PROVIDED			WIND		EARTHQUAKE	
1	2	3	4	5	6 W	7 W	6 E	7 E
Line Label	Minimum BUs Required	Bracing Element No.	Bracing Type	Length Element (m) L	Rating BU/m W	BUs Achieved (BU/m x L) W	Rating BU/m E	BUs Achieved (BU/m x L) E
M								
N								
O								
P								
Q								

	Totals Achieved	**W** achieved	**E** achieved
From Sheet A	Totals Required	**W** required*	**E** required*
		W achieved must exceed W required*	E achieved must exceed E required*

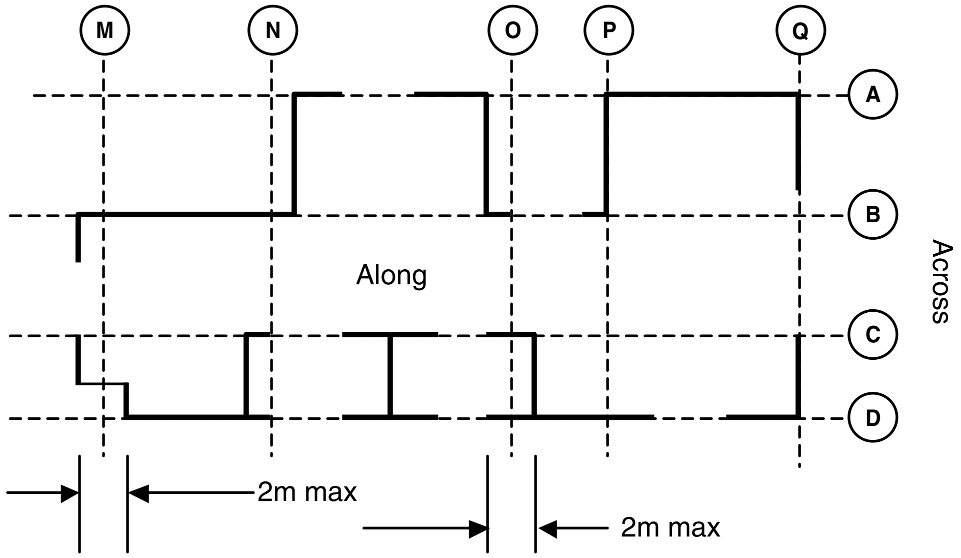
For manual calculations only

* from Calculation Sheet A

Distribution of Wall Bracing Elements

JUNE 2011

Distribute bracing by drawing a grid pattern of bracing lines along and across the building. Bracing lines must coincide as much as possible with wall bracing elements. Pairs of bracing elements may be counted on a single line provided they are no more than 2m apart as illustrated below. Locate wall bracing elements evenly throughout the building and as close as practical to corners of external walls.



Bracing lines must be spaced no more than;

- 6m for standard construction with any GIB® plasterboard ceiling, or
- 7.5m where dragon ties in accordance with NZS 3604:2011 have been installed to provide lateral strength to walls, or
- 12m with a GIB® plasterboard ceiling diaphragm, constructed in accordance with this publication.

(For ceiling diaphragms see pages 15 and 16).

No bracing line shall have a capacity less than the greater of 100 bracing units or 50% of the total bracing demand (D) divided by the number of bracing lines (n) in the direction being considered (0.5 x D/n).
For this purpose bracing lines less than 1m apart shall be considered one line.

For example, if the bracing demand for the building shown in the diagram above is 2,500 BUs (Wind) and 2,000 BUs (Earthquake) in the across direction (M, N, O, P, Q) each line must each have at least the maximum of 0.5 x 2,500 /5 = 250 BUs (Wind) and 0.5 x 2,000 /5 = 200 BUs (Earthquake).

In addition external walls shall have a bracing capacity no less than 15 bracing units per metre of external wall length.

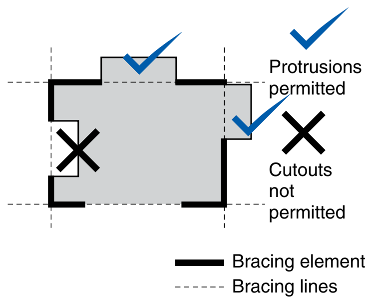
Wall bracing elements on timber floors shall not be rated higher than 120 BU/m.

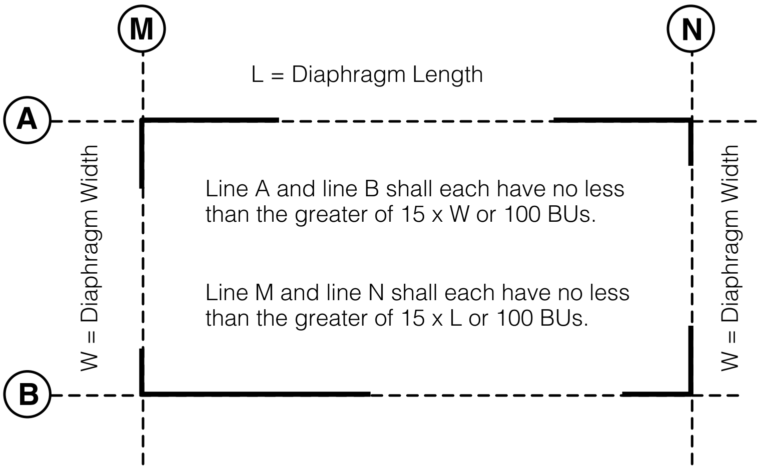
Wall bracing elements on concrete floors shall not be rated higher than 150 BU/m.

Ceiling Diaphragms

JUNE 2011

GIB® Ceiling Diaphragms are stiff and strong horizontal bracing elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, as illustrated.



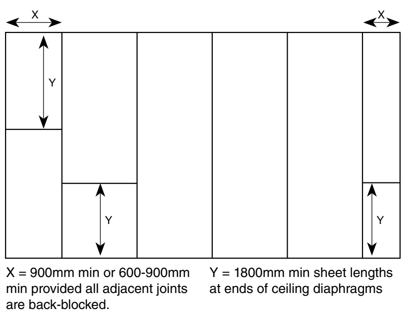


Limitations for GIB® plasterboard ceiling diaphragms

GIB® plasterboard ceiling diaphragms may be constructed as follows:

- For diaphragms not steeper than 15° and not exceeding 7.5m in length, any GIB® plasterboard may be used provided perimeter fixing is at 150mm centres
- For diaphragms not steeper than 45° and not exceeding 7.5m in length and for diaphragms not steeper than 25° and not exceeding 12m in length, any GIB® plasterboard may be used provided perimeter fixing is at 100mm centres

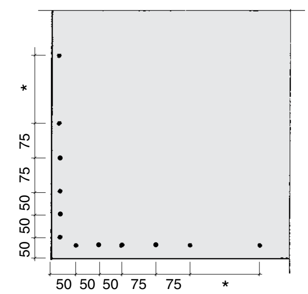
Otherwise construction is in accordance with the general fixing requirements for GIB® ceiling diaphragms outlined below.



Sheet Widths and Lengths in Ceiling Diaphragms

General Fixing Requirements for GIB® Ceiling Diaphragms

- Linings shall be installed over the entire area of the diaphragm.
- Fastening shall be no less than 12mm from sheet edges and not less than 18mm from sheet end.
- Sheets shall be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® Plasterboard and at no more than 600mm centres for 13mm GIB® Plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, "GIB® Site Guide". All joints shall be paper tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see "GIB® Site Guide").
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see "GIB® Site Guide").
- Openings are allowed within the middle third of the diaphragm's length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings, or openings in other locations, require specific engineering design. Refer "Openings in Bracing Elements" page 17.
- Fasteners are placed at 150mm or 100mm centres around the ceiling diaphragm with the corners fastened using the GIB EzyBrace® 2011 fastener pattern.



Fastening pattern for ceiling diaphragms

*** Perimeter centres at 150mm or 100mm depending on diaphragm limitations above**

Battens

Ceiling diaphragms may be constructed using steel or timber ceiling battens.

Battens shall be spaced at a maximum of:

- 500mm for 10mm GIB® Plasterboard
- 600mm for 13mm GIB® Plasterboard

Timber battens shall be fixed in accordance with the requirements of NZS 3604:2011.

Steel battens shall be GIB® Rondo® battens or similar with a minimum base metal thickness (BMT) of 0.55mm with two external flanges of 8mm to allow direct screw fixing to roof framing.

Steel battens shall be fixed with 2/32mm x 8g GIB® Grabber® wafer head self tapping screws to supporting framing.

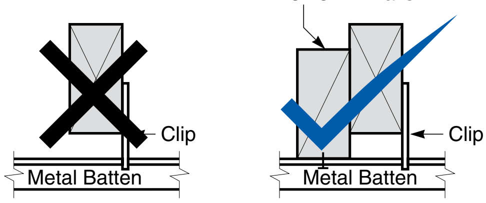
Steel battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten.

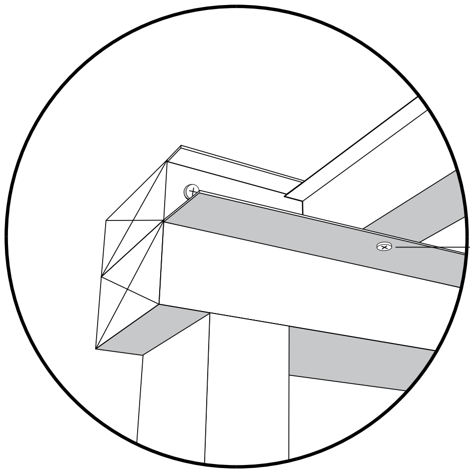
For steel battens a steel channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® wafer head self tapping screws at 300mm centres maximum.

The linings are fastened to the perimeter channel in case (a) with 25mm x 6g self tapping screws at 150mm centres and in case (b) to the 140mm x 35mm top plate with 32mm x 6g GIB® Grabber® high thread screws at 150mm centres. Within the diaphragm area sheets may be fastened as described in 'General Fixing Requirements for GIB® Ceiling Diaphragms'.

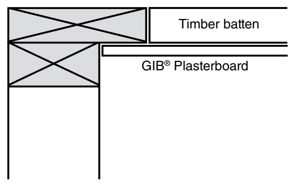
Perimeter fastenings shall be spaced at:

- 150mm for ceiling diaphragms up to 7.5m and not steeper than 15 degrees
- 100mm for ceiling diaphragms 7.5m–12m or steeper than 15 degrees

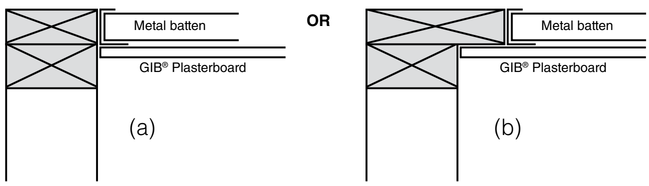




Timber battens example

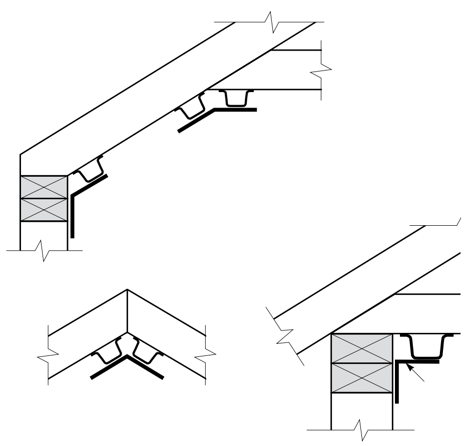


Steel battens with perimeter channel example



Coved ceiling diaphragms can be achieved by attaching a folded metal angle to the junction. The metal angle shall be;

- min 0.55mm BMT
- fastened at 300mm centres on each edge using 30mm GIB® Nails or 32mm x 8g GIB® Grabber® wafer head self tapping screws or similar to the roof framing.
- linings are fastened to the folded angle as specified for the perimeter at 150mm centres with 25mm x 6g self tapping screws.



GIB® Plasterboard Linings

When fixing part sheets of GIB® Plasterboard, a minimum width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, the sheet end butt joints may be back-blocked.

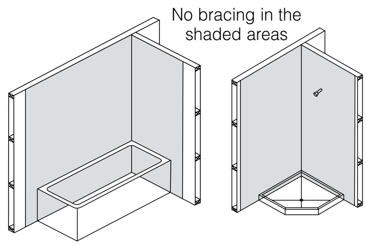
Plasterboard bracing element sheets must be fixed directly to the wall framing, eg bracing must be provided by the inner layer of a multilayer system. When a GIB® bracing element has been designated for a section of wall, BU ratings can not be increased by incorporating additional proprietary bracing elements within that same section of wall.

Limitations

GIB® Plasterboard must be stacked flat and protected from the weather. GIB® Plasterboard must be handled as a finishing material. GIB® Plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected. GIB EzyBrace® Systems must not be used in showers or behind baths. It is highly recommended not to install GIB® Plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements. If GIB® Plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in Water-Splash Areas

When GIB® Plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

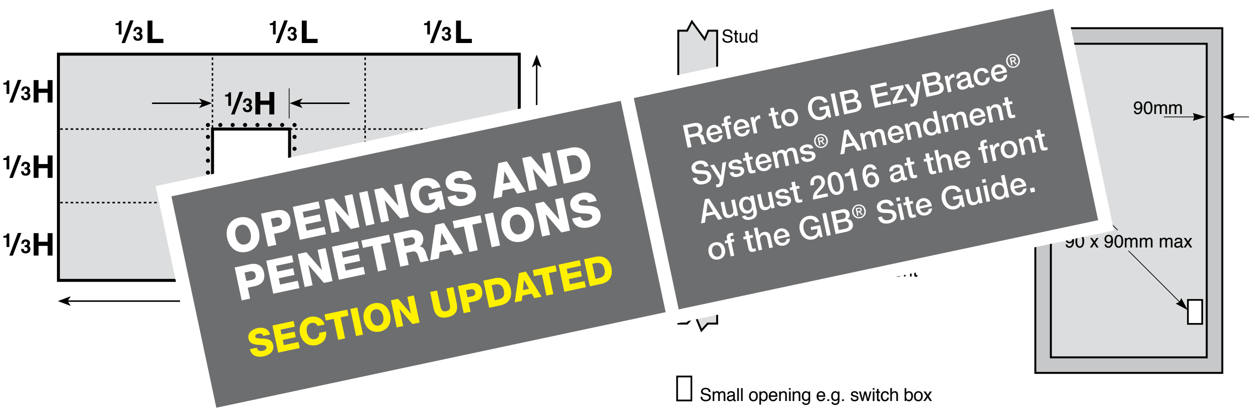


Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in Bracing Elements

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



Framing

General framing requirements such as grade, spacings and installation shall comply with the New Zealand Building Code and the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 35mm for external walls and 70 x 45mm for internal walls. Wall bracing tests on GIB EzyBrace® Systems were undertaken without nogs. Nogs are not considered to add to the bracing performance of the wall.

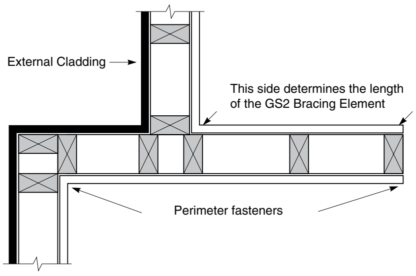
Guidelines for intersection walls

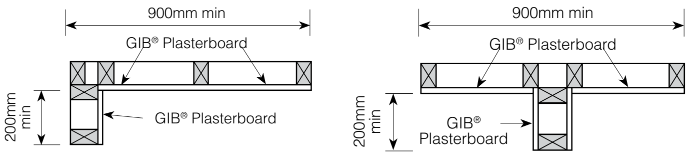
Where the lining on a double lined internal GS2 Bracing Element is shorter on one side, the length of the element is taken as the shorter wall length but bracing fasteners can still follow the wall perimeter on both sides.

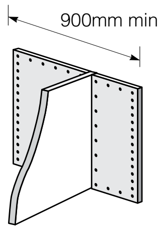
GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. **The bracing element length must be no less than 900mm.**

Where a Wall Bracing Element is interrupted by a T or L junction the element is deemed to be continuous for the whole length (900mm in the example illustrated).

When fixing part sheets of GIB® Plasterboard, a minimum width of 300mm applies for bracing elements.







GS and BL Element
Specified corner and perimeter fastener pattern

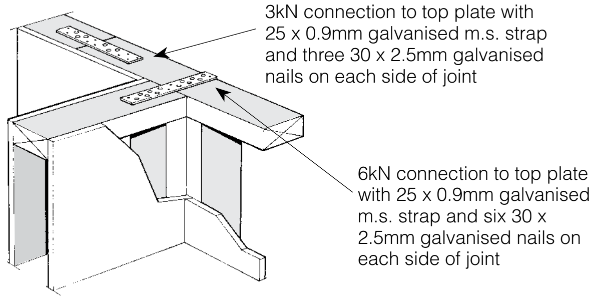
Junction
Min 32x6 GIB® Grabber® high thread screws @ 300mm crs each side

Top Plate Connections

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

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

(b) Rating exceeding 100 bracing units: A 6kN connection as shown or by an alternative fixing of 6kN capacity tension or compression along the plate.



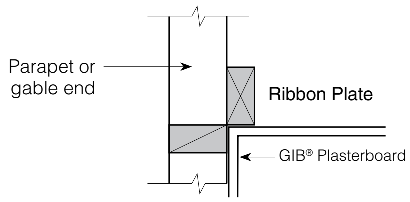
Parapets and Gable End Walls

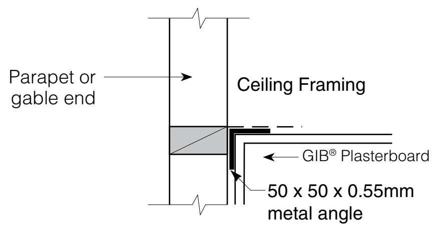
Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90x45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line.

OR

A minimum 50x50x0.55mm metal angle is installed as shown. The angle is fixed to a row of nogs with 30x2.5mm galv FH nails at 300mm centres.





Bottom Plate Fixing

JUNE 2011

Bottom plate fixings for GIB® Bracing Elements

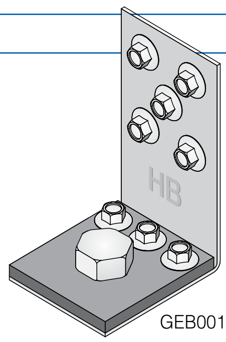
Brace type	**Concrete slabs**		**Timber floors**
	External wall	**Internal wall**	**External and Internal walls**
GS1-N	As per NZS 3604:2011. No specific additional fastening required	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm washers, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3 / 90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011
GS2-N	Not applicable		
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011. In addition: GIB Handibrac® fixings or metal wrap-around strap fixings and bolt as illustrated on pages 19 and 20.		Pairs of 100 x 3.75mm flat head hand driven nails or 3 / 90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB Handibrac® fixings or metal wrap-around strap fixings and bolt as illustrated below.
BLG-H	Not applicable	As for GSP-N, BL1-H, BLP-H on concrete slab above	

Panel Hold-down Details

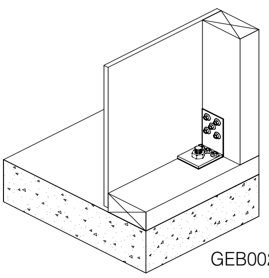
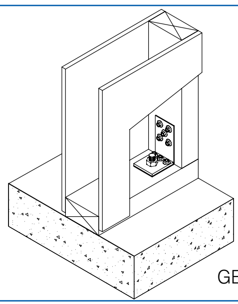
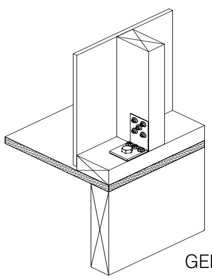
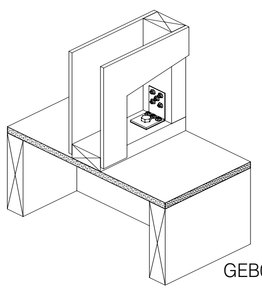
GIB HandiBrac® – RECOMMENDED METHOD

Developed in conjunction with MiTek™ NZ, the GIB HandiBrac® has been designed and tested for use as a hold-down in GIB® BL and GSP bracing elements.

- The GIB HandiBrac® registered design provides for quick and easy installation
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps
- The GIB HandiBrac® is suitable for both new and retrofit construction
- The design also allows for installation and inspection at any stage prior to fitting internal linings



GEB001

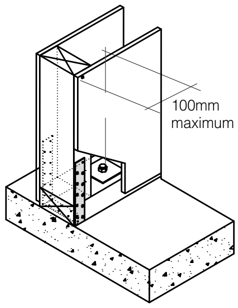
Concrete Floor		**Timber Floor**	
External walls	**Internal walls**	**External walls**	**Internal walls**
 GEB002	 GEB003	 GEB004	 GEB005
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate	Position GIB HandiBrac® at the stud / plate junction	Position GIB HandiBrac® in the centre of the perimeter joist or bearer	Position GIB HandiBrac® in the centre of floor joist or full depth solid block
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN.		12x150mm galvanised coach screw	

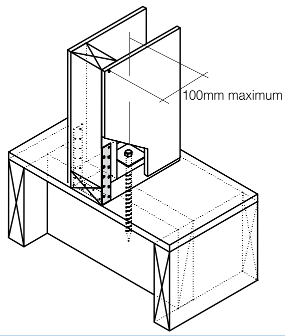
Refer to gib.co.nz/cad for CAD details.

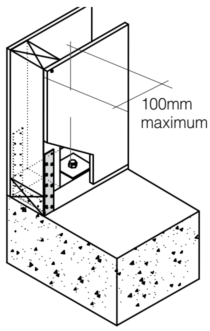
Construction

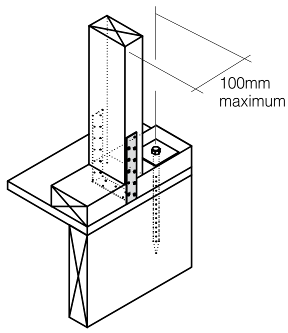
Panel Hold-down Details

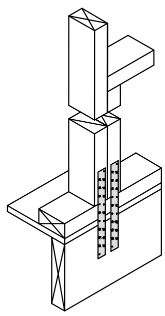
JUNE 2011

<table>
<tr><th colspan="2">Bracing strap Installation</th></tr>
<tr><td colspan="2">Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard. It should be positioned in such a way that the important corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the important corner fastenings to be installed without having to penetrate the bracing strap.</td></tr>
<tr><th>Concrete Floor</th><th>Timber Floor</th></tr>
<tr><td colspan="2">400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30x2.5mm flat head galvanised nails to each side of the stud. Three 30x2.5mm flat head galvanised nails to each side of the plate. Hold down bolt to be fitted within 100mm of the end of the element.</td></tr>
<tr><th colspan="2">Internal wall</th></tr>
<tr><td>

GEB006</td><td>

GEB007</td></tr>
<tr><th colspan="2">External wall</th></tr>
<tr><td>

GEB008</td><td>

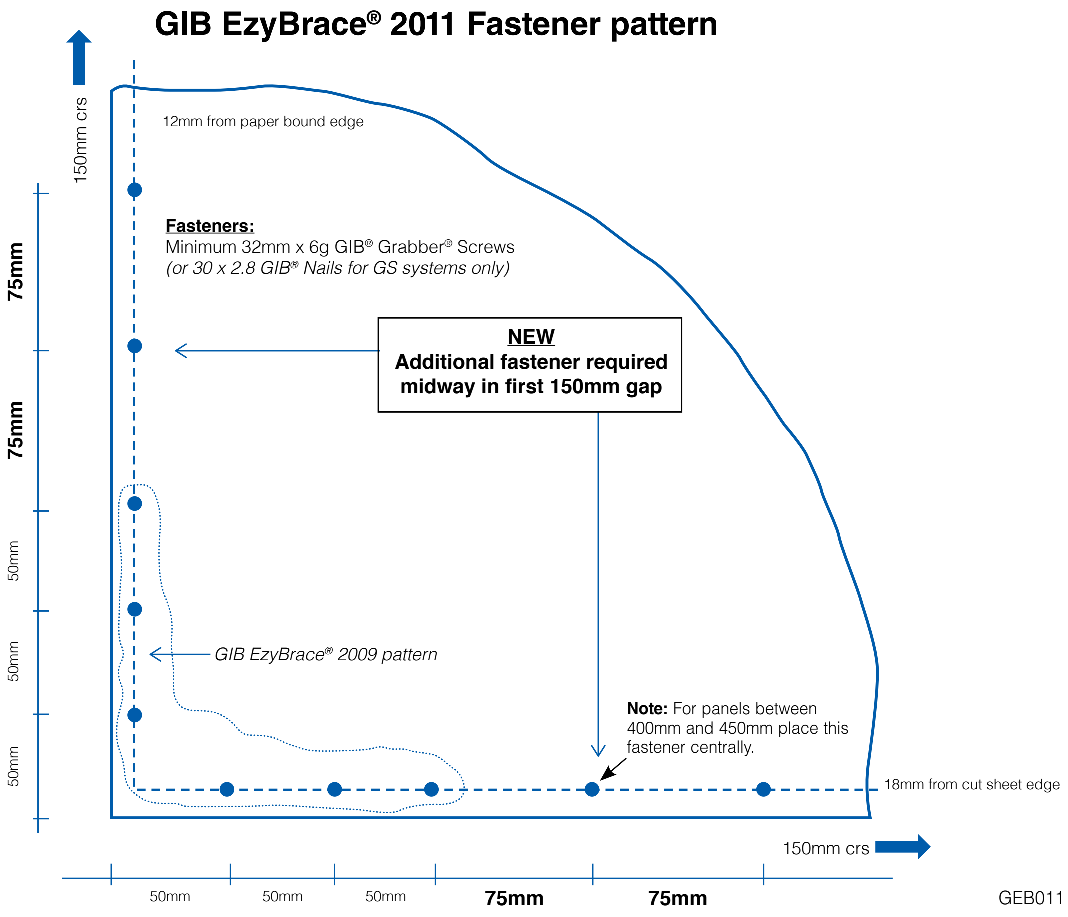
GEB009</td></tr>
<tr><td rowspan="2">NB: where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at the web address gib.co.nz/cad</td><td>2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.</td></tr>
<tr><td>
GEB010</td></tr>
<tr><th colspan="2">Hold-down fastener requirements</th></tr>
<tr><th>Concrete floor</th><th>Timber floor</th></tr>
<tr><td>A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50x50x3mm square washer within 100mm of the ends of the bracing element.</td><td>12x150mm galvanised coach screw fitted with a 50x50x3mm square washer within 100mm of the ends of the bracing element</td></tr>
</table>

Refer to gib.co.nz/cad for CAD details.

Construction Details

JUNE 2011

Revised Fastener Pattern for *all four corners* of GIB EzyBrace® Elements
As GIB Braceline® screws are no longer required for BL bracing elements, two additional fasteners must be installed in ***all four corners*** of GIB EzyBrace® GS and BL elements, as shown. Fasteners must be placed no closer than 12mm from the paper bound sheet edge and no closer than 18mm from sheet ends or cut edges.



Refer to gib.co.nz/cad for CAD details.

PERMITTED GIB® PLASTERBOARD SUBSTITUTIONS IN GIB EZYBRACE® SYSTEMS

GIB Ezybrace® Systems have been designed and tested using only the products specified. Occasionally additional properties may be required to be provided by a different GIB® Plasterboard product. The following table provides acceptable substitution options.

Specified	Permitted alternative GIB® Plasterboard products								
	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	OK	NOTE 2		
GIB Braceline®	X	X		NOTE 1	OK	X	NOTES 1 and 2		

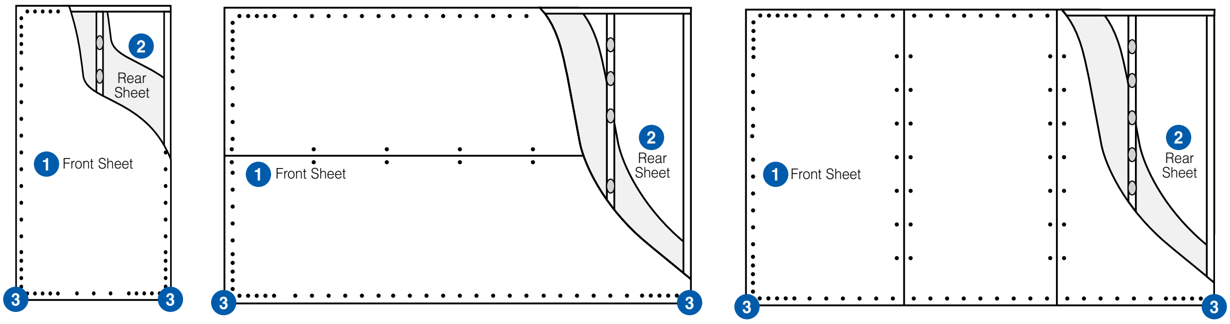
NOTE 1 The element must be 900mm or longer. Use 32mm x 6g GIB® Grabber® drywall screws at ***100mm*** centres to the perimeter of the bracing element. The bracing corner fastening pattern, as illustrated above, applies to all four corners of the element. Panel hold-down fixings are required.

NOTE 2 The fastener type and length must be as required for the relevant FRR system but the fixing pattern must be as shown above.

Construction

Construction Details

JUNE 2011



System	Lining one side 1		Lining opposite side 2		Panel Hold-Down Fixings 3	Fastener spacing
	Lining	Fasteners	Lining	Fasteners		
GS1-N	Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws	Not required	Not required	Not required	*GIB® Plasterboard* Corner fastening pattern as illustrated above Fasteners at 150mm to bracing element perimeter, and: • at 300mm centres to intermediate sheet joints for vertical fixing, or • at stud / sheet junction for horizontally fixed elements, and • GIBFix adhesive daubs at 300mm crs to intermediate framing *Plywood* Fasteners at 150mm around the perimeter of every sheet and at 300mm centres to intermediate studs. Place fasteners no closer than 7mm from sheet edges. Plasterboard corner fastener pattern does not apply to plywood.
GS2-N			Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws		
GSP-H			Minimum 7mm Ecoply manufactured to AS/NZS 2269	50mm x 2.8mm Flat head galvanised or stainless steel nails	Yes, see Pages 19 and 20	
BL1-H	10mm or 13mm GIB Braceline®	minimum 32mm x 6g GIB® Grabber® high thread screws	Not required	Not required		
BLG-H			Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws		
BLP-H		GIB Braceline® Nails may be used for 10mm GIB Braceline® ONLY	Minimum 7mm Ecoply manufactured to AS/NZS 2269	50mm x 2.8mm flat head galvanised or stainless steel nails		

Construction

GIB EzyBrace® System Specification – GS1-N

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard Plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

INTERNAL WALL BRACING LINES

In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

EXTERNAL WALL BRACING LINES

In accordance with the requirements of NZS 3604 for external plate fixing.

WALL LINING

Any 10mm or 13mm GIB® Plasterboard lining.
Sheets can be fixed vertically or horizontally.
Sheet joints shall be touch fitted.
Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING

Fasteners

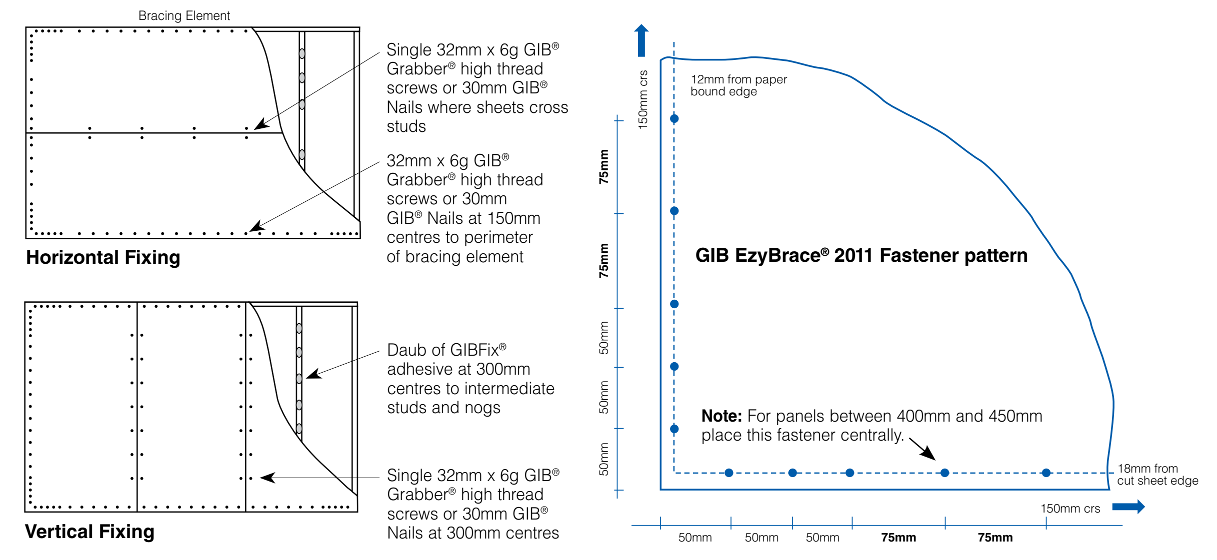
32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails.

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.
For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints.
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.
Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).

BRANZ Appraised
Appraisal No.294 [2011]

Construction

GIB EzyBrace® System Specification – GS2-N

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard Plasterboard fixed to each side of the wall framing.

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

INTERNAL WALL BRACING LINES

In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

One layer 10mm or 13mm GIB® Plasterboard to each side of the wall.

Sheets can be fixed vertically or horizontally.

Sheet joints shall be touch fitted.

Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB® Ezybrace Systems 2011.

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails.

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints.

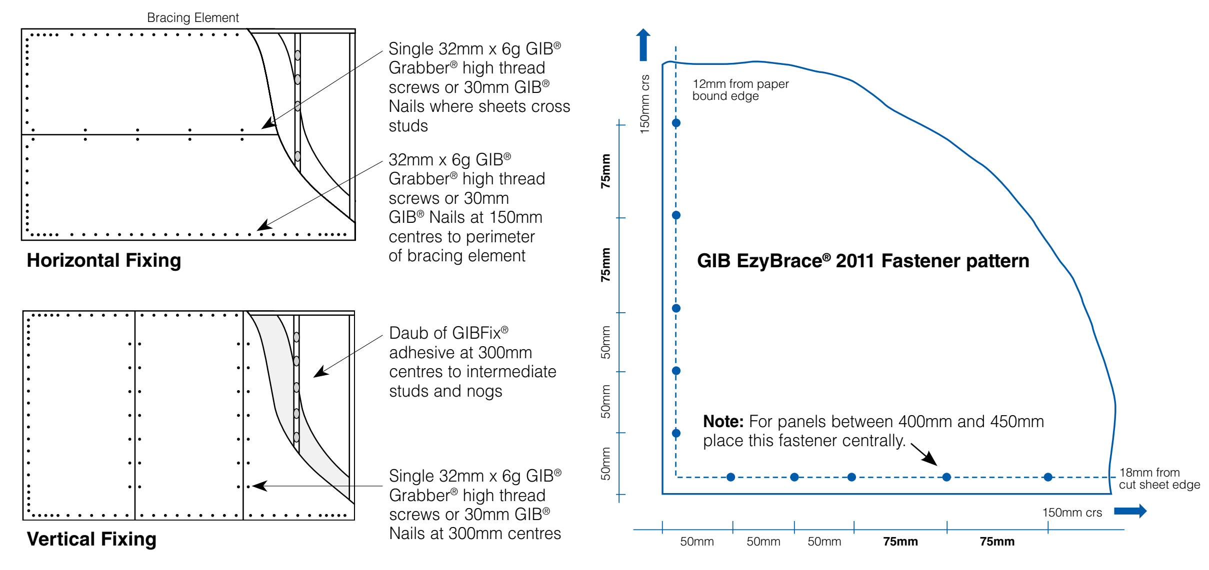
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.

Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).

BRANZ Appraised
Appraisal No.294 [2011]

GIB EzyBrace® System Specification – GSP-H

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement	Other Requirements
GSP-H	0.4	Any 10mm or 13mm GIB® Plasterboard lining to one side of framing and minimum 7mm Ecoply to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems 2011 or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer any 10mm or 13mm GIB® Plasterboard to one side of the wall plus minimum 7mm Ecoply construction plywood manufactured to AS/NZS 2269:2004 to the other side. Plasterboard sheets can be fixed vertically or horizontally. Plywood sheets to be fixed vertically, with edges supported. Sheet joints shall be touch fitted.

Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING

Fasteners

Plasterboard

32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails.

Plywood

50 x 2.8mm Galv or Stainless steel FH nails.

Fastener centres

GIB® Plasterboard side

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints.

For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.

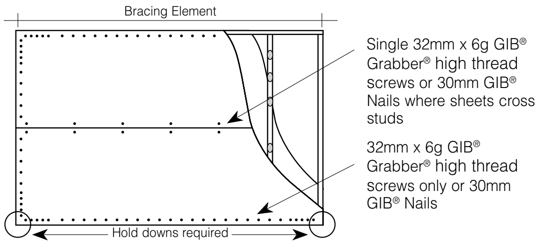
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

Plywood side

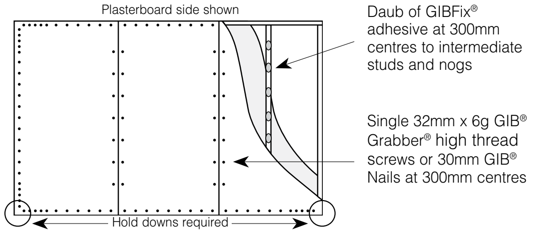
150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

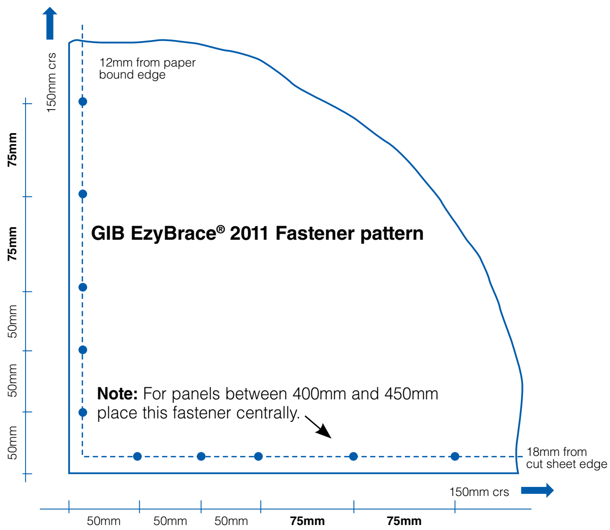
All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



Horizontal Fixing



Vertical Fixing



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).

BRANZ Appraised
Appraisal No.294 [2011]

GIB EzyBrace® System Specification – BL1-H

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide.
Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or
Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer 10mm or 13mm GIB® Braceline.
Sheets can be fixed vertically or horizontally.
Sheet joints shall be touch fitted.
Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING

Fasteners

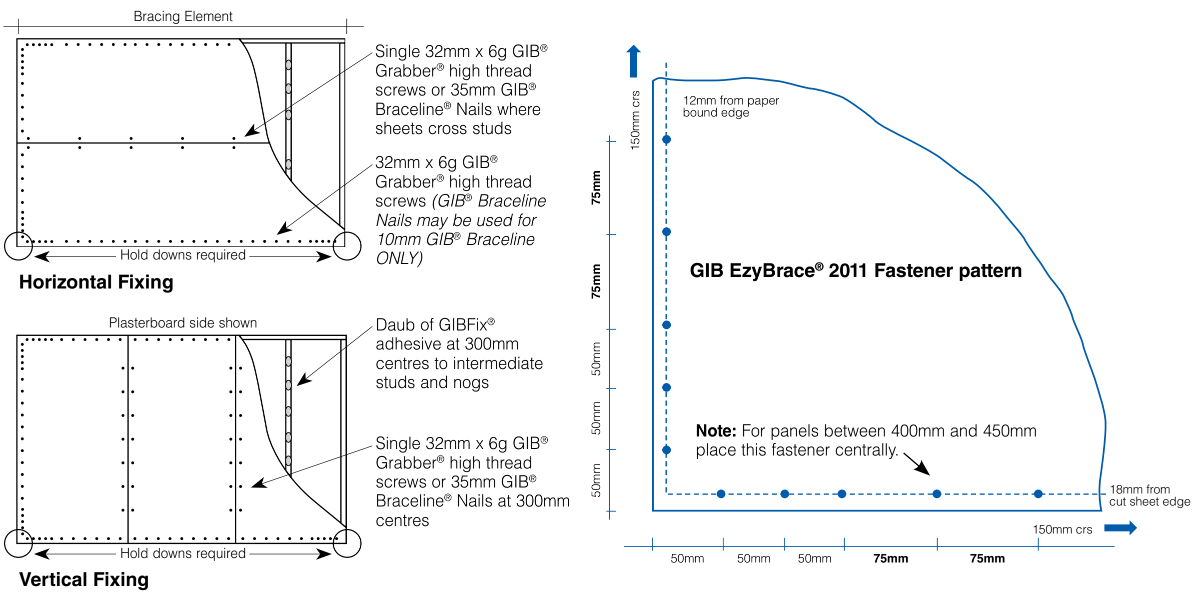
32mm x 6g GIB® Grabber® high thread screws. (GIB Braceline® Nails may be used with 10mm GIB Braceline® only.)

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.
For vertically fixed sheets place fasteners at 300mm centres to the sheet joint.
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.
Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).

BRANZ Appraised
Appraisal No.294 [2011]

GIB EzyBrace® System Specification – BLG-H

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB Plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide.
Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or
Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer 10mm or 13mm GIB® Braceline to one side of the wall plus any 10mm or 13mm GIB® Plasterboard lining to the other side. Sheets can be fixed vertically or horizontally. Sheet joints shall be touch fitted. Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING

Fasteners

GIB Braceline® side
32mm x 6g GIB® Grabber® high thread screws.
(GIB Braceline® Nails may be used with 10mm GIB Braceline® only)

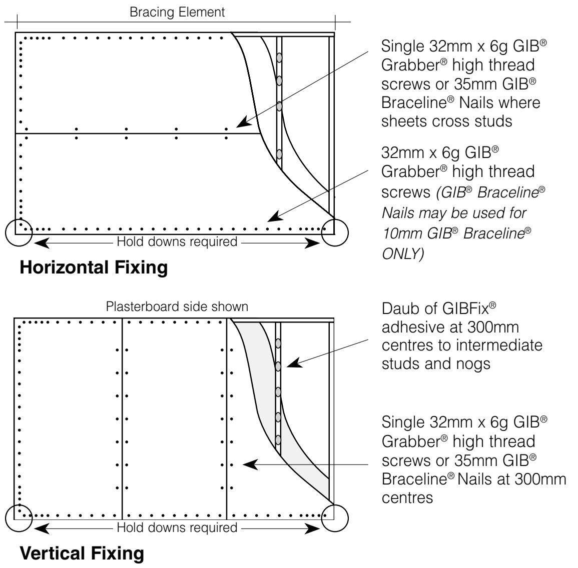
Other side
32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB Nails.

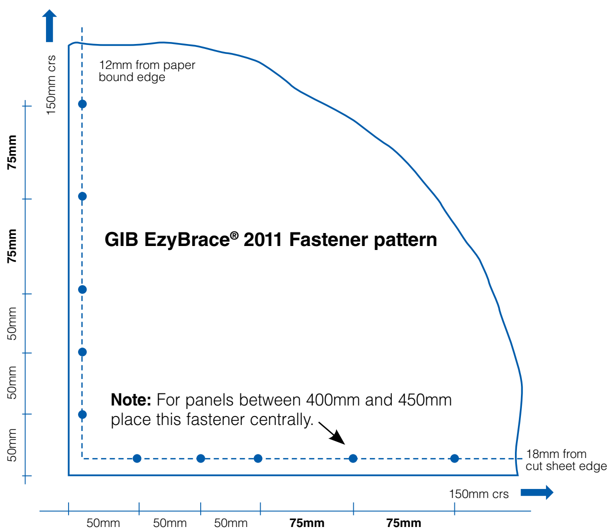
Fastener centres

50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element.
For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints.
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.
Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.





In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).

BRANZ Appraised
Appraisal No.294 [2011]

Construction

GIB EzyBrace® System Specification – BLP-H

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm Ecoply to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide.
Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or
Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm Ecoply construction plywood manufactured to AS/NZS 2269:2004 to the other side. Plasterboard sheets can be fixed vertically or horizontally. Plywood is to be fixed vertically with edges supported. Sheet joints shall be touch fitted. Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING

Fasteners

GIB Braceline® side
32mm x 6g GIB® Grabber® high thread screws.
(GIB Braceline® Nails may be used with 10mm GIB Braceline® only)

Plywood
50 x 2.8mm Galv or Stainless steel FH nails.

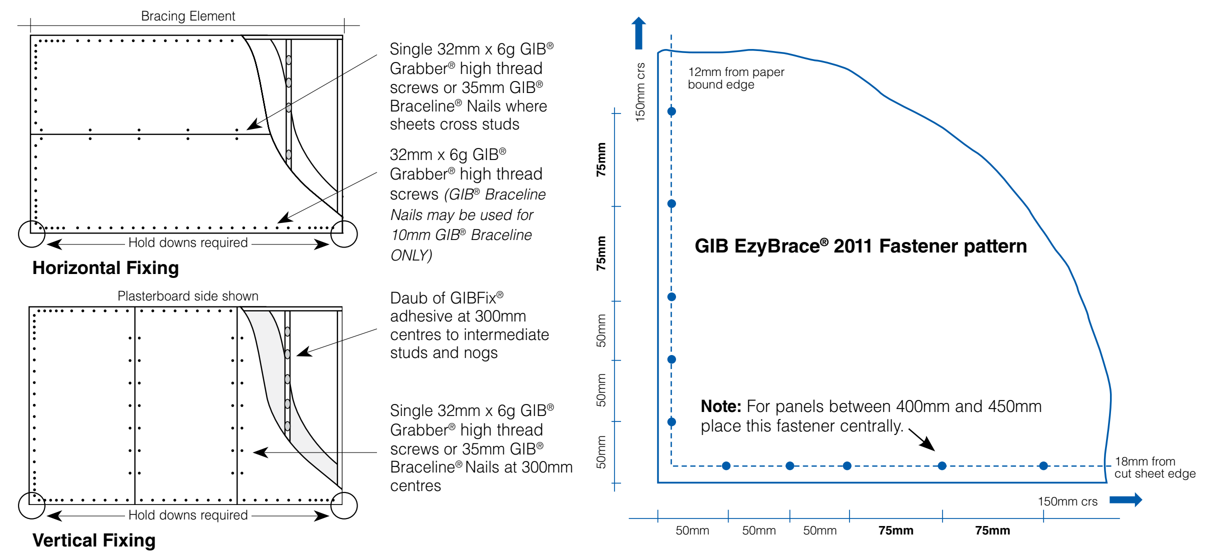
Fastener centres

GIB® Plasterboard side
50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element.
For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints.
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.
Use daubs of GIB®Fix adhesive at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

Plywood side
150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).

BRANZ Appraised
Appraisal No.294 [2011]

NOTES

GIB

NOTES

JUNE 2011

GIB® Products
Manufactured by Winstone Wallboards Ltd. Distributed nationwide by authorised distributors.

Trademarks
The names GIB®, GIB Ultraline®, GIB Toughline®, GIB Noiseline®, GIB Braceline®, GIB Aqualine®, GIB Wideline®, GIB Fyreline®, GIB Soundseal®, GIB-Cove®, GIB Rail®, GIB Tradeset®, GIB HandiBrac®, the colour mauve for GIB Toughline® and the colour blue for GIB Braceline®, GIB Living Solutions®, GIB Living®, GIB Dry Zone®, GIB Tough Zone®, GIB Feature Zone®, GIB Fix®; GIB Quiet Zone® and EzyBrace® are all trademarks of Fletcher Building Holdings Ltd.

GIB® Help Line - Call Free

0800 100 442

Free Facsimile

0800 229 222

E-mail

bracing@gib.co.nz

Internet Website

www.gib.co.nz

Auckland
P.O. Box 12 256 Penrose. Telephone 0-9-633 0100.
Facsimile 09-633 0101.

Printed in New Zealand using mineral-oil-free inks on environmentally responsible Media Satin using PEFC pulp from a mill that is EMAS accredited and ISO 14001 certified.

Winstone Wallboards Limited
37 Felix Street, P O Box 12256
Penrose, Auckland, New Zealand
Phone 64-9-633 0100, Facsimile 64-9-633 0101
Internet website: www.gib.co.nz
E-mail: bracing@gib.co.nz

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