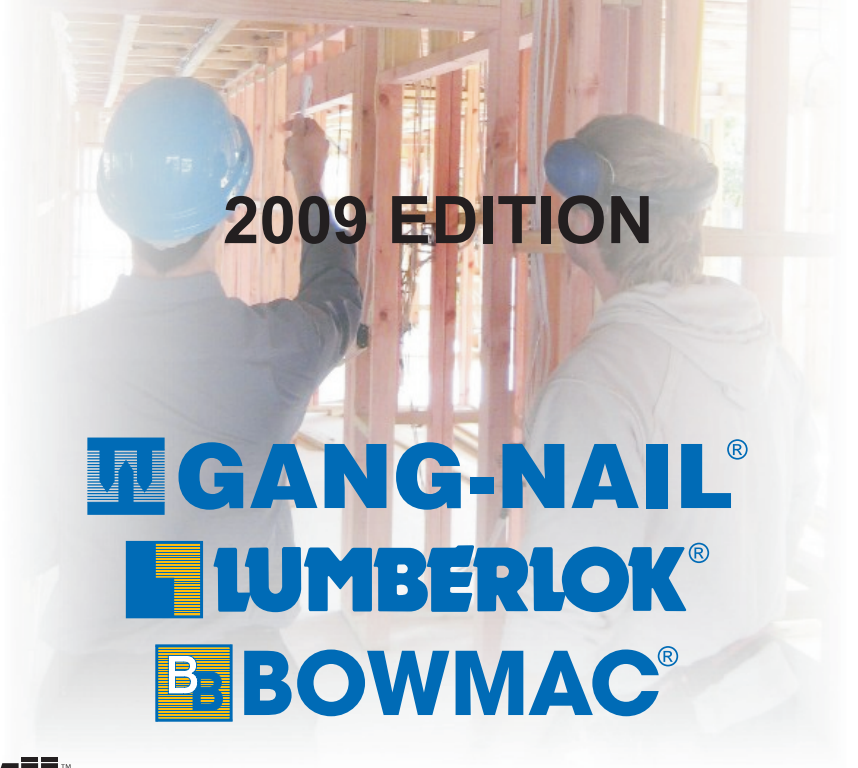
MiTek New Zealand Ltd.

GANG-NAIL® LUMBERLOK® BOWMAC®

STRUCTURAL FIXINGS ON-SITE GUIDE FOR BUILDING CODE COMPLIANCE



2009 EDITION

GANG-NAIL®

LUMBERLOK®

BOWMAC®

The information in this booklet contains designs which give an easy on-site installation guide when fixing connectors, nail plates and structural brackets in relation to the Building Code Approved Documents B1 Structure and B2 Durability.

Further design advice on the selection of MiTek™ products can be provided by contacting our technical support offices in Auckland or Christchurch.

AUCKLAND
PO Box 58-014, Greenmount
Phone: (09) 274 7109
Fax: (09) 274 7100 **www.miteknz.co.nz**

CHRISTCHURCH
PO Box 8387, Riccarton
Phone: (03) 348 8691
Fax: (03) 348 0314

GANG-NAIL®
LUMBERLOK®
BOWMAC®

MiTek™

INDEX

(Section numbers refer to relevant section of NZS 3604:1999)

2. GENERAL

- Timber Strength Properties 3

TIMBER STRENGTH PROPERTIES
AS PER NZS 3603:1993 AMENDMENT 4

MSG Grades

Timber Grade	Bending Strength f_b (MPa)	Compress. Strength f_c (MPa)	Tensile Strength f_t (MPa)	Shear Strength f_s (MPa)	Modulus of Elasticity E (GPa)	Lower Bound Modulus of Elasticity E_{lb} (GPa)
MSG6	10.0	15.0	4.0	3.8	6.0	4.0
MSG8	14.0	18.0	6.0	3.8*	8.0	5.6
MSG10	20.0	20.0	8.0	3.8*	10.0	7.5

*f_s = 3.0 MPa for Douglas Fir

Verified Visual Grades

VSG8	14.0	18.0	6.0	3.8*	8.0	5.6
VSG10	20.0	20.0	8.0	3.8*	10.0	6.7

Unverified Visual Grades

No 1 Framing (Unverified)	10.0	15.0	4.0	3.8*	6.0	4.0

Timber Sizes

Call Size	Gauged Kiln Dried Size (in mm) (Actual Size)	Rough Sawn (in mm) (Actual Size)
100 x 50	90 x 45	100 x 50
150 x 50	140 x 45	150 x 50
200 x 50	190 x 45	200 x 50
250 x 50	240 x 45	250 x 50
300 x 50	290 x 45	300 x 50
100 x 100	90 x 90	100 x 100
150 x 100	140 x 90	150 x 100
200 x 100	190 x 90	200 x 100
250 x 100	240 x 90	250 x 100
300 x 100	290 x 90	300 x 100

Note: It is common now to refer to the timber size as the Kiln Dried Size. Where the Call Size refers to the use of Rough Sawn timber the Actual Dry Size then becomes the Call Size. The Actual Size is the size used in the design calculations.

4. DURABILITY

DURABILITY - PRODUCT SELECTION

ALTERNATIVE SOLUTION FOR TABLE 4.1 NZS 3604:1999

Zones	Environment	Product Option
All Zones	**Closed** (A)	GANG-NAIL and LUMBERLOK Standard Zinc Coated Product[1]
Zones 1, 2, 3	**Treated Timber Piles (Sub-floor)** (B) Fixings BELOW 600mm from ground (C) Fixings ABOVE 600mm from ground	LUMBERLOK Stainless Steel 304[2] LUMBERLOK Hot Dip Galvanised[1]
All Zones	**Roof Spaces** (D) Assumed Closed	GANG-NAIL and LUMBERLOK Standard Zinc Coated Product[1]
Sea Spray Zones 1, 2, 3	**Sheltered** (E) (F, G) Vented MORE than 7000 mm^2/m^2 (F, G) Vented LESS than 7000 mm^2/m^2	LUMBERLOK and BOWMAC Stainless Steel 304[2] LUMBERLOK Stainless Steel 304[2] and/or BOWMAC Hot Dip Galvanised[3] LUMBERLOK and BOWMAC Hot Dip Galvanised[1, 3]
Sea Spray Zones 1, 2, 3	**Exposed** (H) (I)	LUMBERLOK and BOWMAC Stainless Steel 304[2] LUMBERLOK Stainless Steel 304[2] and/or BOWMAC Hot Dip Galvanised[3]
Zone 4	**Geothermal Areas** (J)	Refer to MiTek New Zealand Ltd.

1. All GANG-NAIL, LUMBERLOK and BOWMAC product complies with Table 4.2 NZS 3604:1999.
2. LUMBERLOK and BOWMAC Stainless Steel product is 304 grade. Regular washing and maintenance will positively affect long term appearance of these items.
3. The average 900gm/m^2 galvanising on BOWMAC product is an alternative solution to the “additional protection” given in 4.4.4 and 4.4.5 NZS 3604:1999. Refer to supporting documents below.

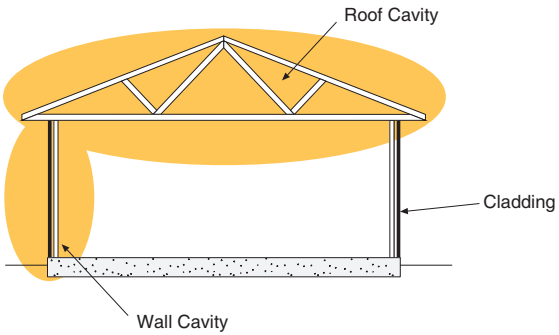
NOTES

Items above refer to GANG-NAIL®, LUMBERLOK® and BOWMAC® product marketed for specific applications with a requirement to last 50 years as an alternative solution to Table 4.1 NZS3604:1999.

The MiTek New Zealand Ltd Durability Flow Chart (Formerly GANG-NAIL Group Ltd Durability Flow Chart – October 1999) for product selection is derived from this alternative solution to Table 4.1 NZS 3604:1999. Definitions of zones and environments are derived from NZS 3604:1999.

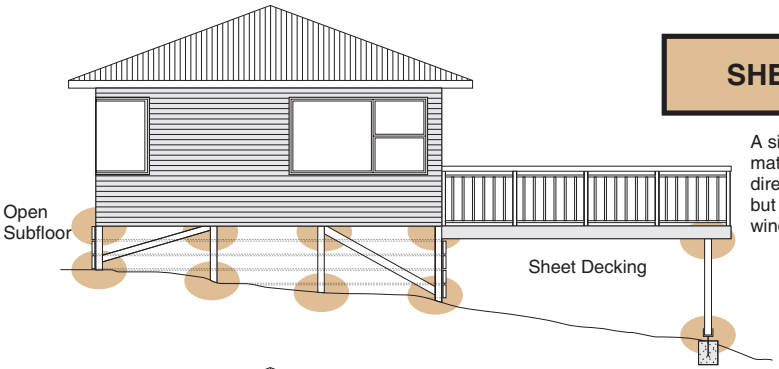
Supporting documents available for this alternative solution:-
Les Boulton and Associates. Materials and Corrosion Consultants Report 00330: Evaluation of Bracket Durability; NZS 3604:1999 and Report 01372: Corrosion of BOWMAC Fixings in Treated Timber.
Optimech Services Metallurgical Consultancy Test Certificate Reports No: 00-134 BOWMAC and No: 01-023 LUMBERLOK Determination of Galvanising Coating thickness.
Producer statements February 2001 for LUMBERLOK and BOWMAC products.

DURABILITY FLOW CHART



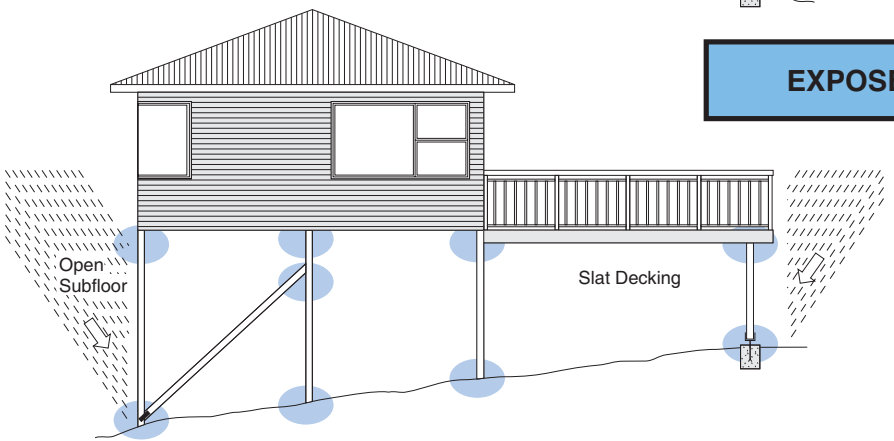
CLOSED

A situation where a material is not exposed to rain or ground moisture and wind blown corrosive salts.



SHELTERED

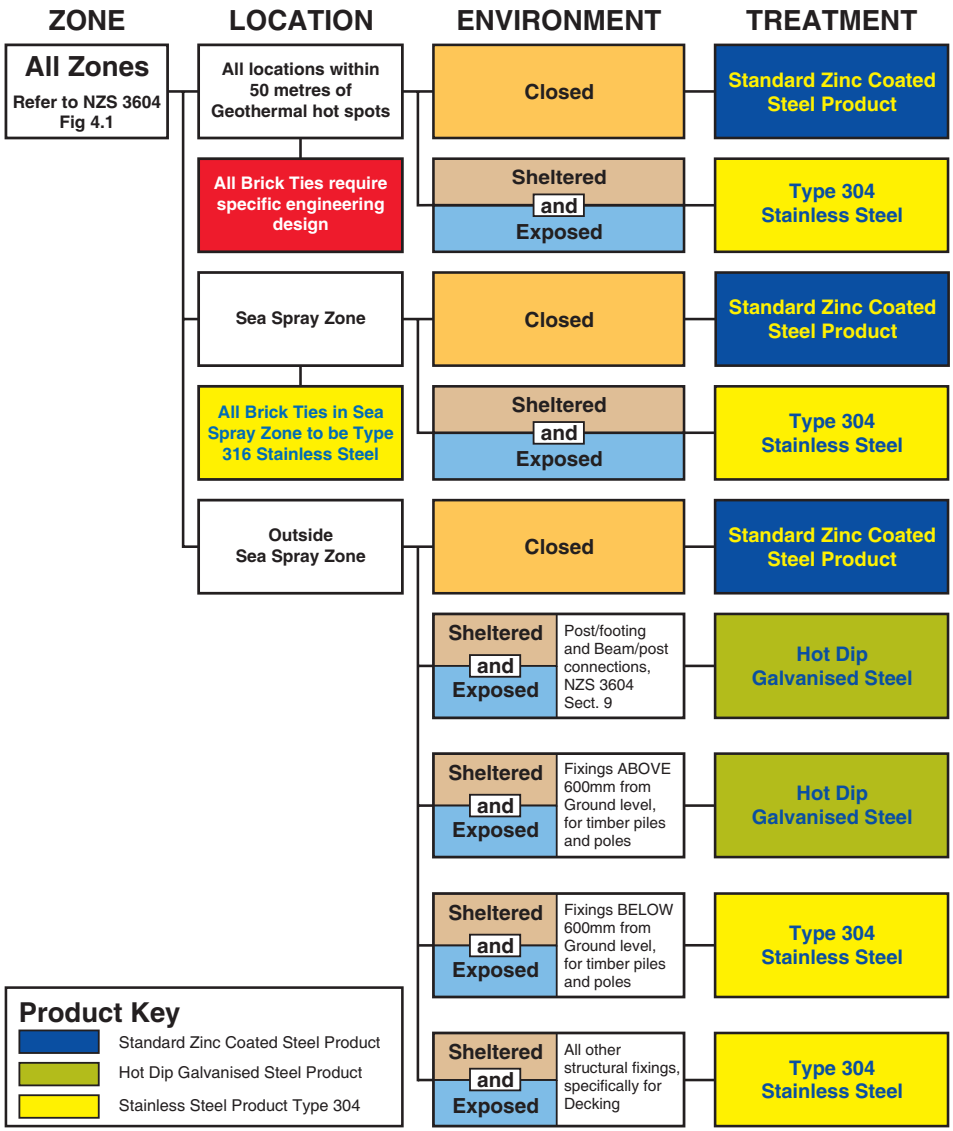
A situation where a material is not washed by direct or wind blown rain but may be subject to wind blown salts.

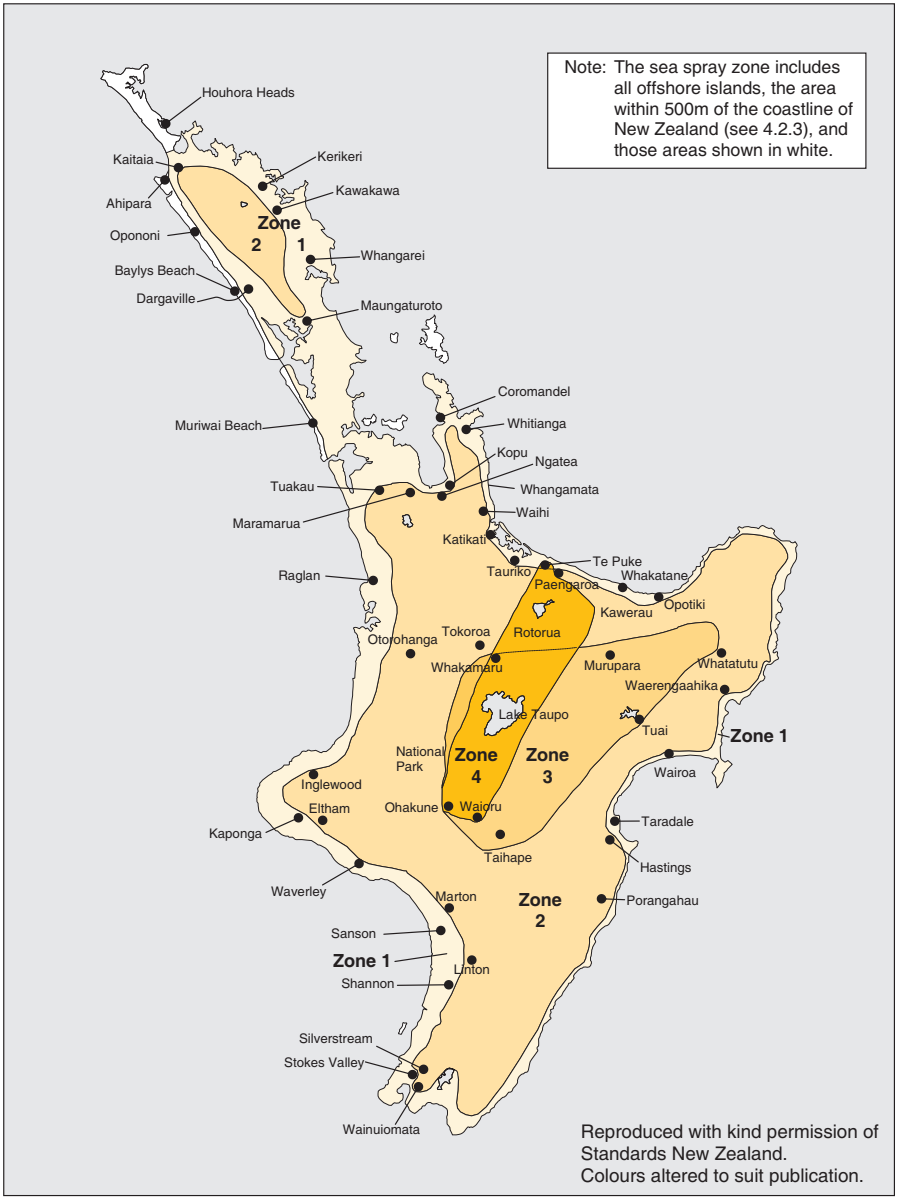


EXPOSED

A situation where the material is washed by direct or wind blown rain.

DURABILITY FLOW CHART





Corrosion Zone map

Reproduced with kind permission of Standards New Zealand.
Colours altered to suit publication.

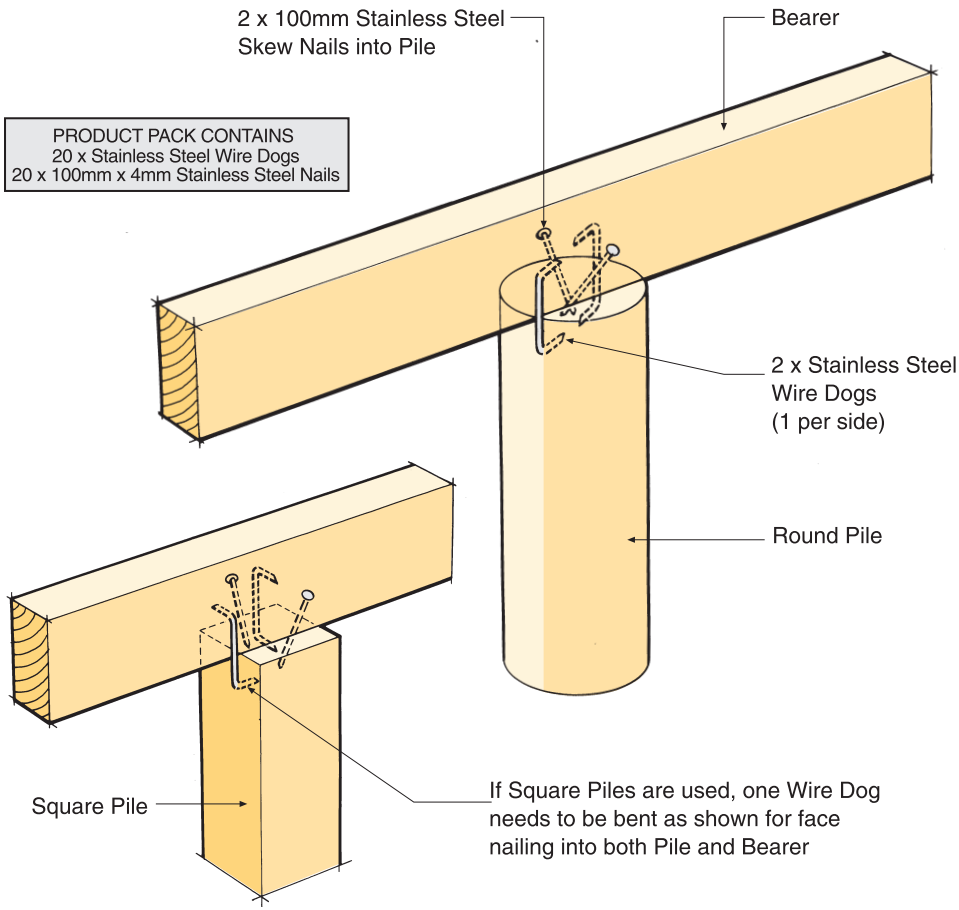
Corrosion Zone map (continued)

6. FOUNDATION AND SUBFLOOR FRAMING

LUMBERLOK®

ORDINARY PILE FIXING

- ★ Complies with NZS 3604:1999
- ★ All Fixings Stainless Steel
- ★ For all Ordinary Piles (Refer Figure 6.3 NZS 3604:1999)

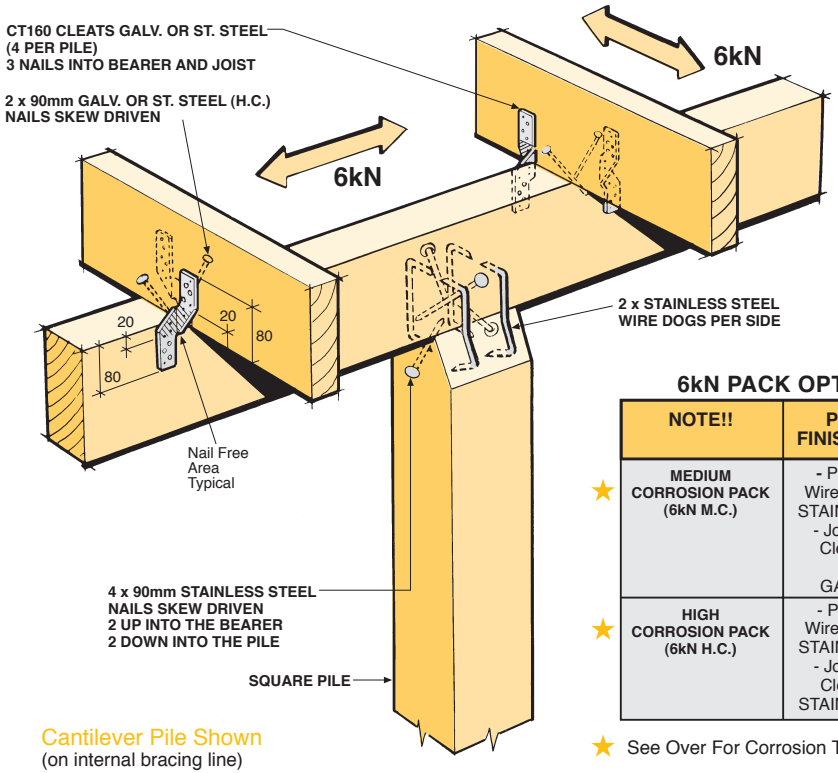


Available from leading Builders Supply Merchants throughout New Zealand

LUMBERLOK®

6kN PILE FIXING

- ★ The 6kN Pile Fixing must be installed in accordance with this brochure
- ★ Auckland University Tested. Test Ref. 4613
- ★ All subfloor construction must be in accordance with NZS 3604:1999
- ★ NZS 3604 requires lines of lateral support to floor joists within 300mm of bearer or bracing lines, refer to Clause 7.1.2



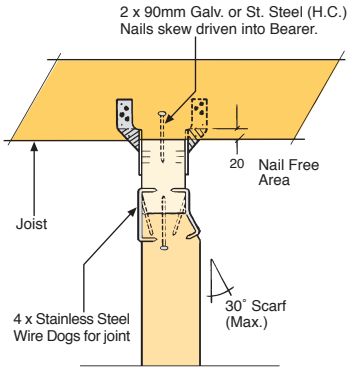
Cantilever Pile Shown
(on internal bracing line)

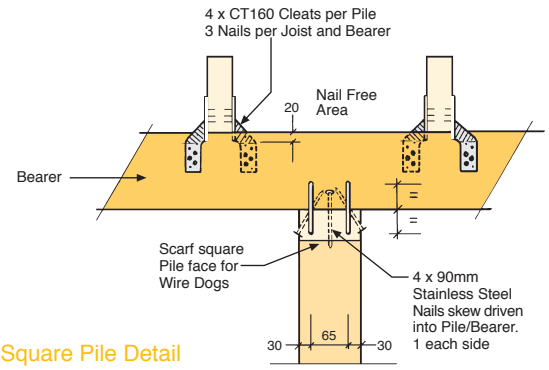
6kN PACK OPTIONS

	NOTE!!	PRODUCT FINISH OPTIONS
★	MEDIUM CORROSION PACK (6kN M.C.)	- Pile to Bearer Wire Dogs & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails HOT DIP GALVANISED
★	HIGH CORROSION PACK (6kN H.C.)	- Pile to Bearer Wire Dogs & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails STAINLESS STEEL

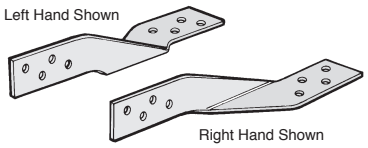
★ See Over For Corrosion Table.

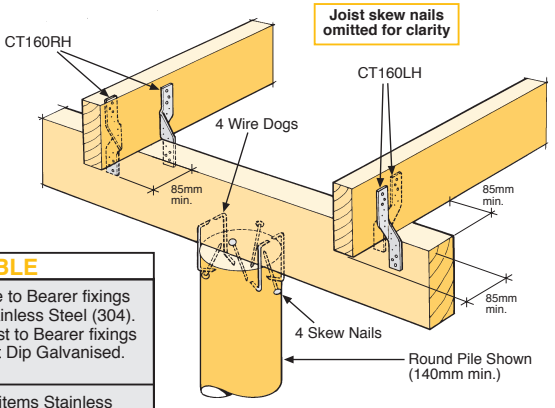
Available from leading Builders Supply Merchants throughout New Zealand





Square Pile Detail





CORROSION HAZARD USE TABLE	
Medium Corrosion Pack (6kN MC) - Outside geothermal areas - Outside Sea Spray Zones - If Joist to Bearer Fixings ABOVE 600mm from Ground level	Pile to Bearer fixings Stainless Steel (304). Joist to Bearer fixings Hot Dip Galvanised.
High Corrosion Pack (6kN HC) - Sea Spray Zones - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).

6kN Joint Fixing Schedule

PILE TO BEARER	- Wire Dog Staples (4 per joint) Stainless Steel
	- 4 x 90mm Skew Nails (1 per face) Stainless Steel
JOIST TO BEARER	- CT160 Cleats (4 per pile) 160mm long
	- 3 Nails per Cleat into Joist
	- 3 Nails per Cleat into Bearer
	- 2 Skew Nails 90mm (1 per side)
NAILS	- 24 x 45mm x 3.55 dia. Spiral Nails (for Joist to Bearer fixings)
	- 4 x 90mm x 4 dia. St. Steel Nails (M.C. Pack only)
	- 8 x 90mm x 4 dia. St. Steel Nails (H.C. Pack only)

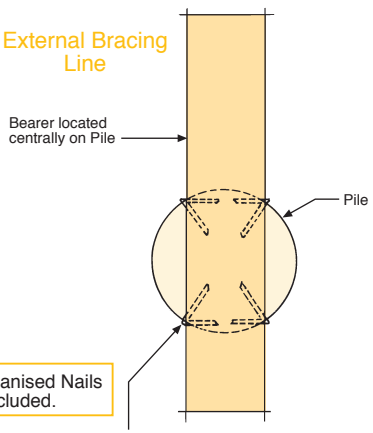
6kN Pile Set Contents

Each set represents 1 x 6kN Pile Fixing
(packed 10 sets per carton)

4 x Wire Dog Staples Stainless Steel
4 x CT160 Cleats
24 x 45mm x 3.55 dia. Spiral Nails
90mm St. Steel Nails to suit 4 - M.C. pack
8 - H.C. pack

Refer front page for Product Finish Options

External Bracing Line



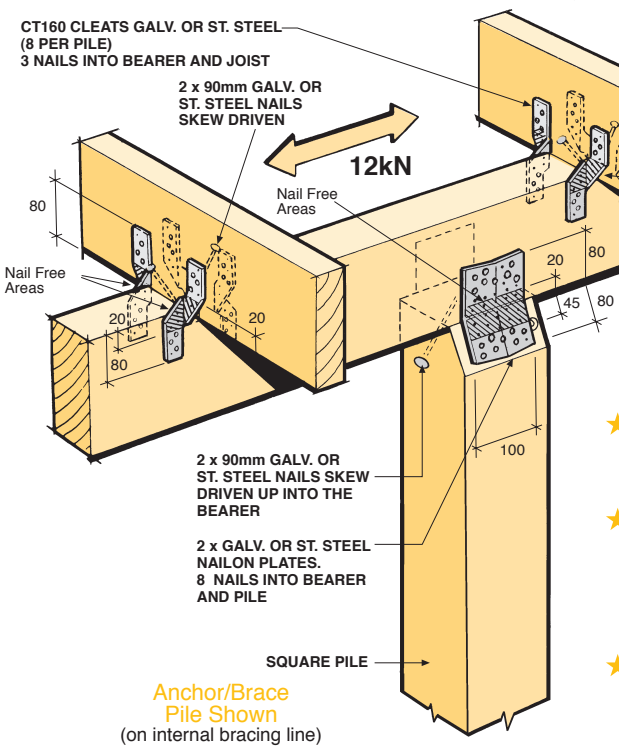
90mm Galvanised Nails not included.

Wire Dog leg to be bent on site to allow each prong to enter each timber surface at 90˚

LUMBERLOK®

12kN PILE FIXING
FOR BRACED PILES OR ANCHOR PILES

- ★ The 12kN Pile Fixing must be installed in accordance with this brochure
- ★ Auckland University Tested. Test Ref. 4613
- ★ All subfloor construction must be in accordance with NZS 3604:1999
- ★ NZS 3604 requires lines of lateral support to floor joists within 300mm of bearer or bracing lines, refer to Clause 7.1.2



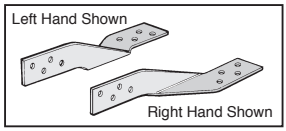
12kN PACK OPTIONS

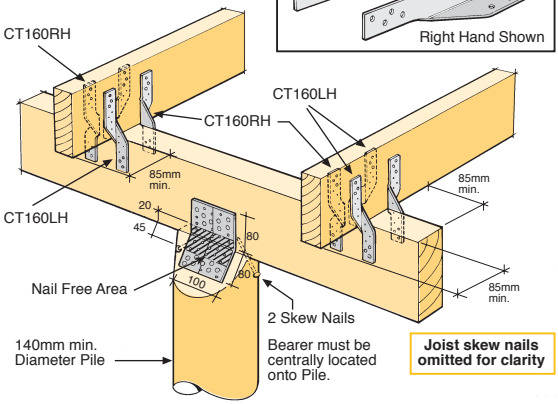
NOTE!!	PRODUCT FINISH OPTIONS
★ STANDARD PACK (12kN Std)	- All items HOT DIP GALVANISED
★ MEDIUM CORROSION PACK (12kN M.C.)	- Pile to Bearer Nailon Plate & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails HOT DIP GALVANISED
★ HIGH CORROSION PACK (12kN H.C.)	- Pile to Bearer Nailon Plate & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails STAINLESS STEEL

★ See Over For Corrosion Table.

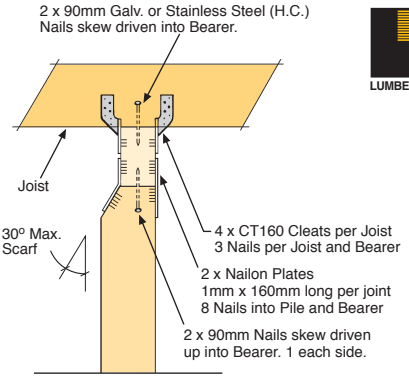
Available from leading Builders Supply Merchants throughout New Zealand

External Bracing Line

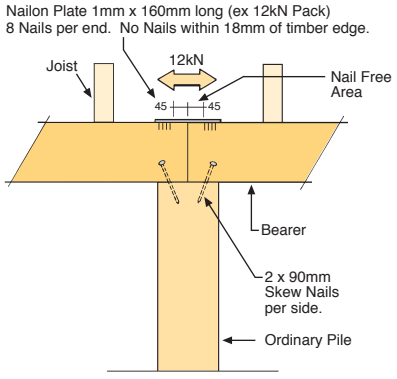




Joist skew nails omitted for clarity



Square Pile

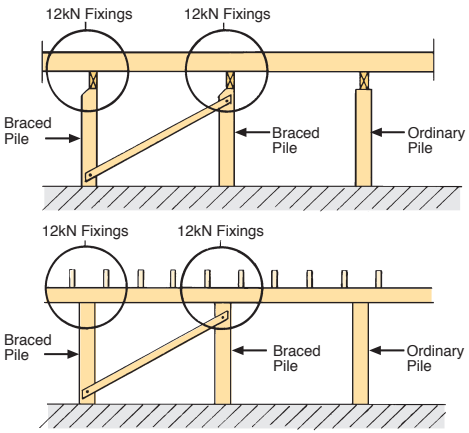


12kN Bearer Splice

Clause 6.12.7.2
NZS 3604:1999

CORROSION HAZARD USE TABLE

Standard Pack (12kN Std) - Outside geothermal areas - Outside Sea Spray Zones - All Fixings ABOVE 600mm from Ground level	All items Hot Dip Galvanised.
Medium Corrosion Pack (12kN MC) - Outside geothermal areas - Outside Sea Spray Zones - Only Joist to Bearer Fixings ABOVE 600mm from Ground level	Pile to Bearer fixings Stainless Steel (304). Joist to Bearer fixings Hot Dip Galvanised.
High Corrosion Pack (12kN HC) - Sea Spray Zones - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).



Sample Subfloor Elevations

12kN Fixing - Pile to Bearer
- Joists to Bearer

12kN Joint Fixing Schedule

PILE TO BEARER	- Nailon Plate (2 per joint) 1mm x 100mm x 160mm long - 8 Nails per Plate into Pile - 8 Nails per Plate into Bearer - 2 Skew Nails 90mm (1 per face)
JOIST TO BEARER	- CT160 Cleats (4 per Joist) 160mm long - 3 Nails per Cleat into Joist - 3 Nails per Cleat into Bearer - 2 Skew Nails 90mm (1 per side)
NAILS	- 80 x 45mm x 3.55 dia. Spiral Nails - 2 x 90mm x 4 dia. St. Steel Nails (M.C. Pack only) - 6 x 90mm x 4 dia. St. Steel Nails (H.C. Pack only)

12kN Pile Set Contents

Each set represents 1 x 12kN Pile Fixing

(packed 4 sets per carton)

2 x Nailon Plates 160mm long
8 x CT160 Cleats
80 x 45mm x 3.55 dia. Spiral Nails
90mm x 4 dia. St. Steel Angular Groove
2 - M.C. Pack
6 - H.C. Pack

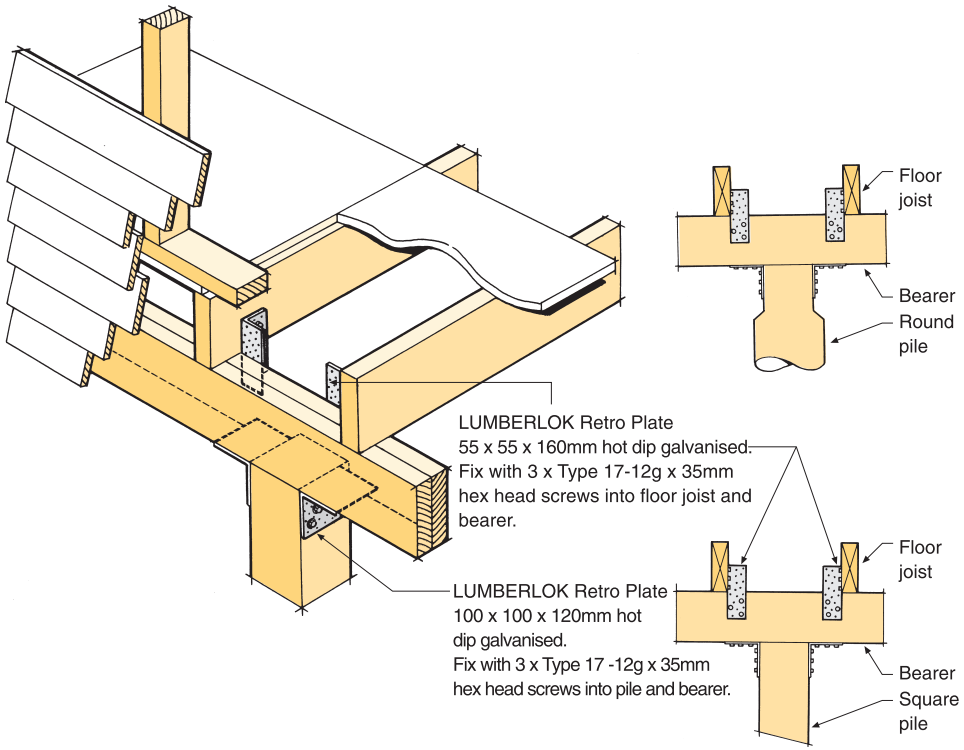
Refer front page for Product Finish Options

90mm Galvanised Nails not included.

LUMBERLOK®

12kN RETRO SUBFLOOR FIXING

★ Fixing to be used when the outside face of the bearer is not accessible e.g. fixing relocatable houses to piles.
★ Stainless Steel option available for sea spray (high corrosion) zones.

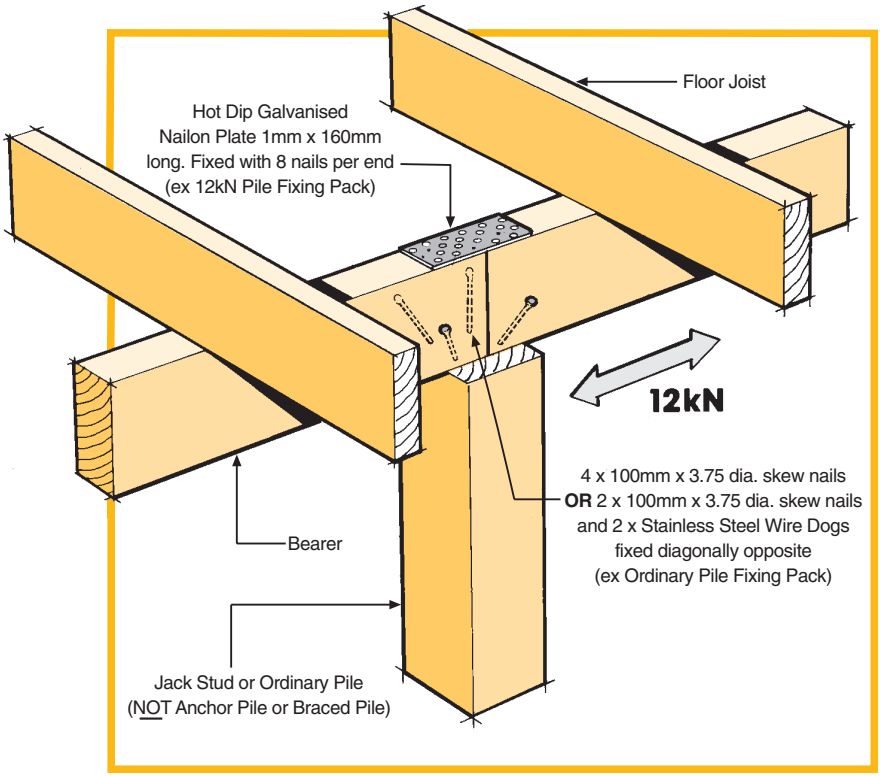


Material: 0.91mm G300 Z275 (Hot Dip Galvanised)
Pack Includes: 8 x Retro Plate 55 x 55 x 160mm
8 x Retro Plate 100 x 100 x 120mm
100 x Type 17 - 12g x 35mm Hex Head Galvanised Screws

LUMBERLOK®

12kN BEARER SPLICE OVER PILE

AS PER CLAUSE 6.12.7 NZS 3604:1999



Stainless Steel Nailon Plate and Nails to be used in high corrosion environments

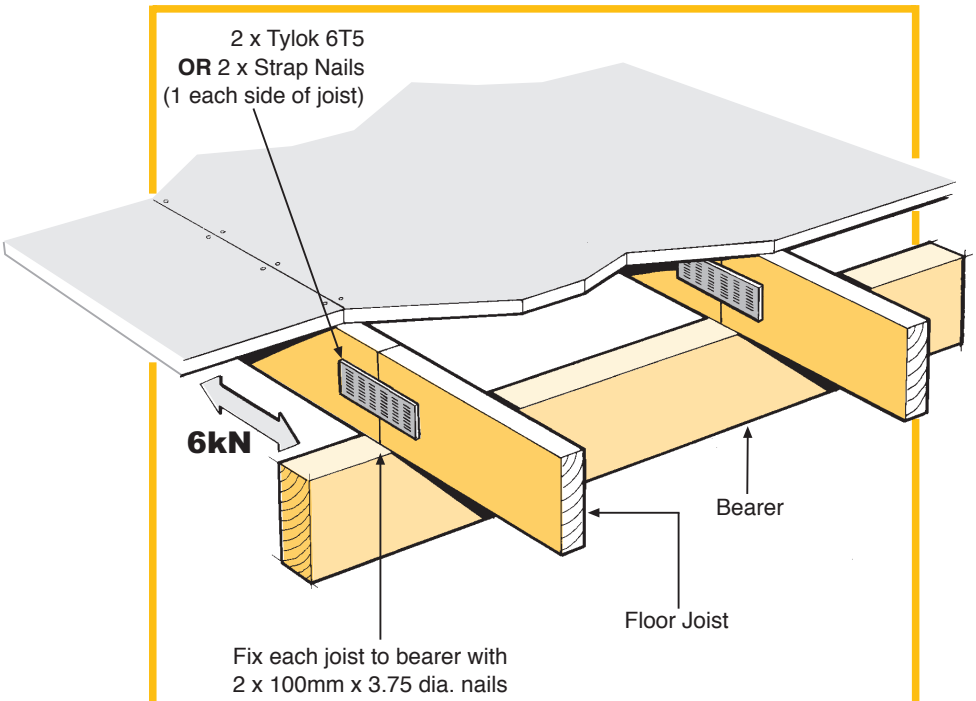
Available from leading Builders Supply Merchants throughout New Zealand

7. FLOOR

LUMBERLOK®

6kN FLOOR JOIST SPLICE OVER BEARER

AS PER CLAUSE 7.1.1.7(c) NZS 3604:1999



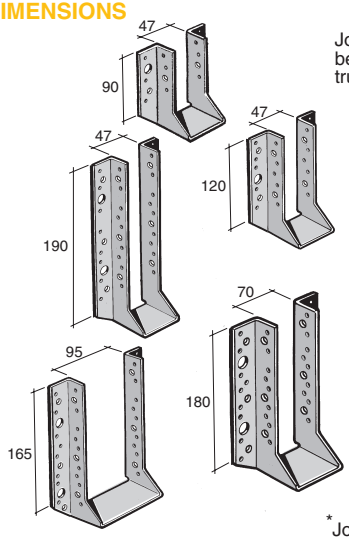
Available from leading Builders Supply Merchants throughout New Zealand

LUMBERLOK®

JOIST HANGERS

USE STAINLESS STEEL OPTION IN EXTERIOR SITUATIONS

DIMENSIONS



Joist Hangers are designed to be used where a strong rigid joint is required between members butting together at 90 degrees, e.g floor joist to beam, truss or rafter to beam/bearer

Joist Hangers to suit 50mm thick (nominal) timber are available in three sizes

***JH47 x 90 -** For use on gauged 47mm wide timber up to 150mm deep.

***JH47 x 120 -** Suitable for gauged 47mm wide timber up to 200mm deep.

***JH47 x 190 -** For gauged 47mm wide timber up to 300mm deep.

Joist Hanger to suit 75mm thick (nominal) timber

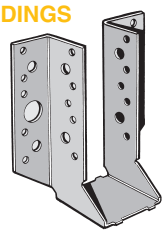
JH70 x 180 - A special size joist hanger designed for gauged 69mm wide timbers.

Joist Hanger to suit 100mm thick (nominal) timber

JH95 x 165 - For use on gauged 94mm wide timber or double joists/trusses.

*Joist Hangers are available in 52 x 90, 52 x 120 and 52 x 190, to suit 52mm wide, rough sawn timber.
37 x 90, 37 x 120 and 37 x 190 are available for 35mm gauged timber.
All sizes (except 37mm) are also available in 304-2B Stainless Steel.

LOADINGS



IMPORTANT NOTE

For other load conditions, refer to the Characteristic Load Table below for correct product selection and nailing or screw fixing.
In some cases it may be necessary to fully nail or screw fix the Joist Hanger.

	Characteristic Load - Nails			Characteristic Load - Screws		
Joist Hanger Type	**No. of Nails per Flange***	**Down**	**Uplift**	**No. of Screws per Flange***	**Down**	**Uplift**
47 x 90	3	9.0 kN	6.0 kN	1	7.0 kN	4.7 kN
47 x 120	5	15.0 kN	10.0 kN	2	14.0 kN	12.0 kN
47 x 190	9	27.0 kN	18.0 kN	3	21.0 kN	18.0 kN
95 x 165	8	24.0 kN	16.0 kN	3	21.0 kN	18.0 kN
70 x 180	8	24.0 kN	16.0 kN	3	21.0 kN	18.0 kN
Nail with LUMBERLOK Product Nails - 30mm x 3.15 dia.				Fix with Type 17-12g x 35mm Hex Head Screws		

* 4 Flanges total

Note: Loads for 47mm Joist Hangers also apply to 52mm & 37mm.

STEEL 0.91 G300 Z275 Galvanised Steel or Stainless Steel 304-2B

JOIST HANGER SELECTION & FIXING RECOMMENDATION

LUMBERLOK®

DOMESTIC FLOOR JOISTS AND COMMERCIAL FLOOR JOISTS UP TO 3.0 kPa LIVE LOAD
(Refer Table 3.1 AS/NZS 1170.1:2002)

★ **Loads 1.** DOMESTIC FLOORS & BALCONIES - **1.5 kPa & 2.0 kPa Live Loads**
(Allows 1.8kN Point Load & 0.4 kPa Dead Load)

2. COMMERCIAL FLOORS - **3.0 kPa Live Load**
(Allows 2.7kN Point Load, 0.5 kPa Dead Load)

★ Floor Joist centres up to 600mm.

★ These charts cover MSG/VSG 6, 8 & 10 timber grades.

★ The same selection & nail/screw pattern applies to gauged 35mm & nominal 50mm timber thickness.

NAILING RECOMMENDATION

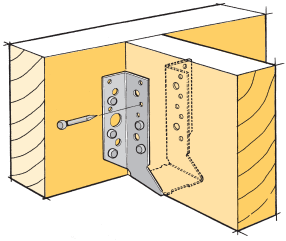
Nail with LUMBERLOK Product Nails - 30mm x 3.15 dia.

Joist Size	Recommended Joist Hanger	Domestic Floors & Balconies Min. No. of Nails Per Flange (4 Flanges Total)	Commercial Floors Min. No. of Nails Per Flange (4 Flanges Total)
100 x 50	JH 47 x 90	2	3
150 x 50	JH 47 x 90	2	3
200 x 50	JH 47 x120	3	4
250 x 50	JH 47 x190	4	4
300 x 50	JH 47 x190	4	5

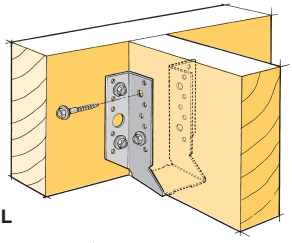
SCREW FIXING RECOMMENDATION

Fix withType 17-12g x 35mm Hex Head Screws

Joist Size	Recommended Joist Hanger	Domestic Floors & Balconies No. of Screws Per Flange (4 Flanges Total)	Commercial Floors No. of Screws & Nails Per Flange (4 Flanges Total)
100 x 50	JH 47 x 90	1	1 Screw + 1 Nail
150 x 50	JH 47 x 90	1	1 Screw + 1 Nail
200 x 50	JH 47 x120	2	2 Screws + 2 Nails
250 x 50	JH 47 x190	2	2 Screws + 2 Nails
300 x 50	JH 47 x190	3	3 Screws + 2 Nails



NAIL DETAIL



SCREW DETAIL

GANG-NAIL®

INTERNAL LOAD BEARING
ON CONCRETE FLOOR SLABS

★ Covers floor thickening and supporting stud requirements.
★ Covers floor slabs on buildings complying with NZS 3604:1999.
★ All concrete slabs to be constructed as per NZS 3604:1999.
★ Thickening requirements apply to reinforced and unreinforced floor slabs.
★ All slabs assumed to be supported on soils that have Ultimate Bearing Capacity of 300kPa ($Ø_b$=0.50).

Establishing Thickening & Stud Requirements

GANG-NAIL®

1. Establish the type of load applied to the floor as being either a UDL (uniformly distributed load) or a concentrated load. Girder trusses will always be concentrated loads and a run of two or more trusses with the same loads will be a UDL.

2. Establish the maximum load value via the MiTek 20/20™ Truss Design Software by using the Truss Bearings Exceeding 10kN Report (see example below). Choose the maximum DOWN value in kN.

3. Go to the Slab Thickening & Stud Requirement Table on page 3 and choose from the appropriate section; either no change for up to 10kN, FP1 and FS1 for up to 20kN, or FP2 and FS2 for up to 30kN.

4. Choose from the selection of stud options (height, centres and grade).

5. Apply the relevant slab and stud requirements as specified and detailed on page 3.

6. Where the maximum positive bearing reaction exceeds 10kN (uplift), refer to MiTek for Special Design.

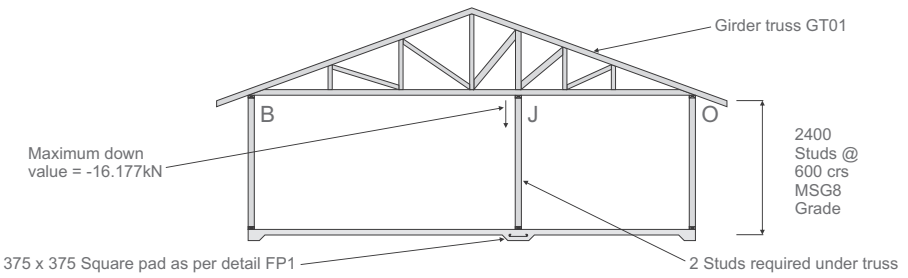
MiTek 20/20™ Example Selection

TRUSS BEARINGS EXCEEDING 10KN REPORT

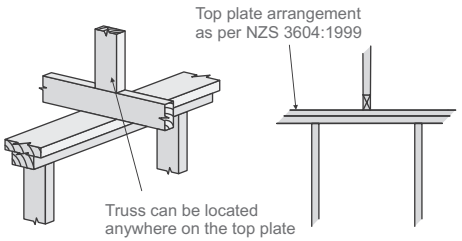
Truss List

Legend: ? = input only, ~~Txx~~ = failed design, Unmarked trusses = designed successfully

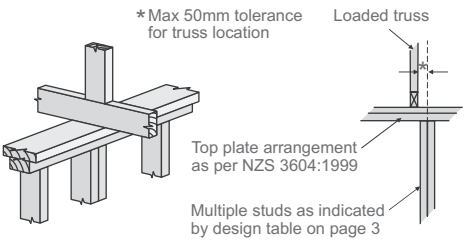
Critical Trusses	Qty	Span (mm)	Joint	Bearing Reactions (kN) Down	Uplift
GT01	1	8000	J	16.177	7.292



SINGLE STUD OPTION



MULTIPLE STUD OPTION



Slab Thickening & Stud Requirement Table

GANG-NAIL®

CONSTRUCTION SPECIFICATIONS

Max truss crs @ 1200mm, Min truss crs @ 600mm.
Assume walls are fully lined on at least one face.
Assume full bearing on top plate (i.e. no eccentric loading).

TRUSS BEARING REACTION	SLAB THICKENING DETAIL		STUD REQUIREMENTS UNIFORM DIST LOADS OR CONCENTRATED LOADS		
	CONCENTRATED LOAD	UNIFORM DIST LOAD	STUD HEIGHT	STUD REQUIREMENTS	
Bearing reaction up to & including 10kN	STANDARD unreinforced or reinforced slab as per NZS 3604:1999	STANDARD unreinforced or reinforced slab as per NZS 3604:1999	2400 2700 3000	Refer to NZS 3604:1999	
			STUD HEIGHT	STUD NO's UNDER TRUSS	MIN. TIMBER SIZE
Bearing reaction up to & including 20kN	TYPE FP1 375 x 375 PAD	TYPE FS1 300 STRIP THICKENING	2400	2	90 x 35
			2700	2	90 x 45
			3000	3	90 x 45
			STUD HEIGHT	STUD NO's UNDER TRUSS	MIN. TIMBER SIZE
Bearing reaction up to & including 30kN	TYPE FP2 450 x 450 PAD	TYPE FS2 450 STRIP THICKENING	2400	3	90 x 45
			2700	3	90 x 45
			3000	4	90 x 45

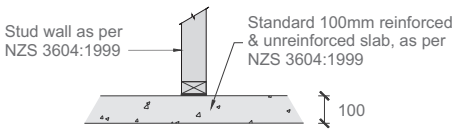
TIMBER SPECIFICATIONS

Timber properties based on NZS 3603:1993 Amendment No.4 March 2005.
Minimum grade specified is MSG8 / VSG8 unless otherwise noted.
For MSG6 and non-verified No 1 Fr Grade, use the studs for the next highest category.
i.e. - For loads up to 10kN select studs from the 20kN table.
- For loads up to 20kN select studs from the 30kN table.
- For loads above 20kN Special Design is required.

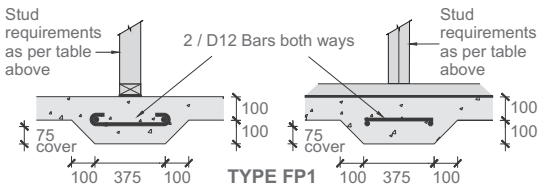
Slab Thickening Details

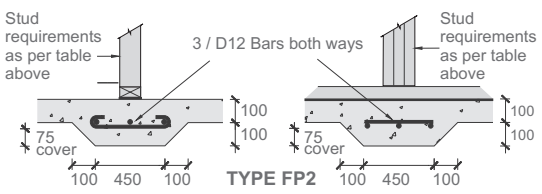
CONCRETE PAD OPTIONS

(for concentrated loads)



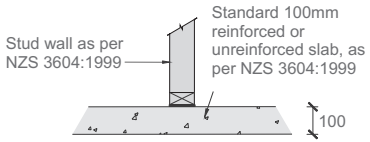
STANDARD 100mm SLAB



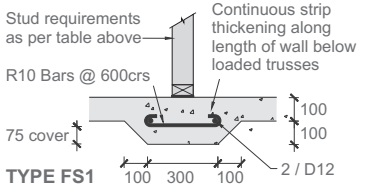


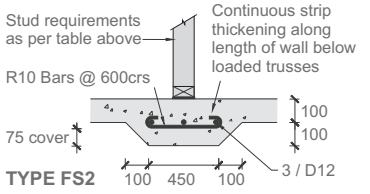
CONTINUOUS CONCRETE THICKENING OPTIONS

(for uniformly distributed loads)



STANDARD 100mm SLAB





NOTE: FP = Foundation Pad FS = Foundation Strip

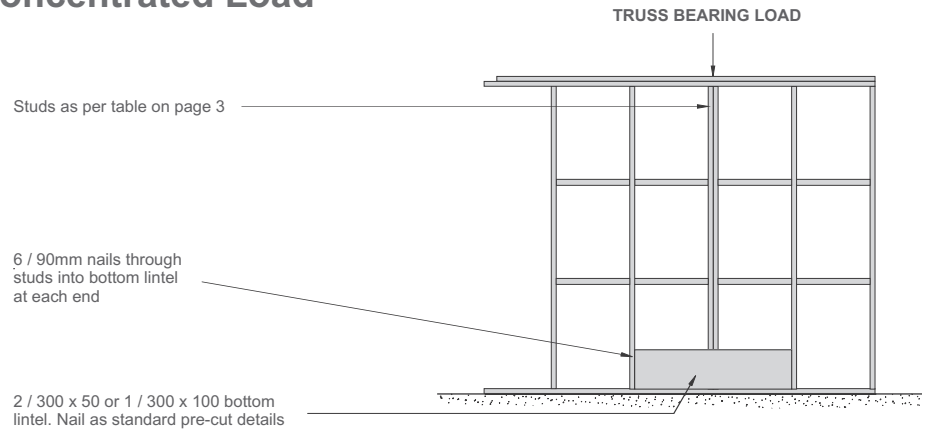
Retro Fitted Load Bearing Option

GANG-NAIL®

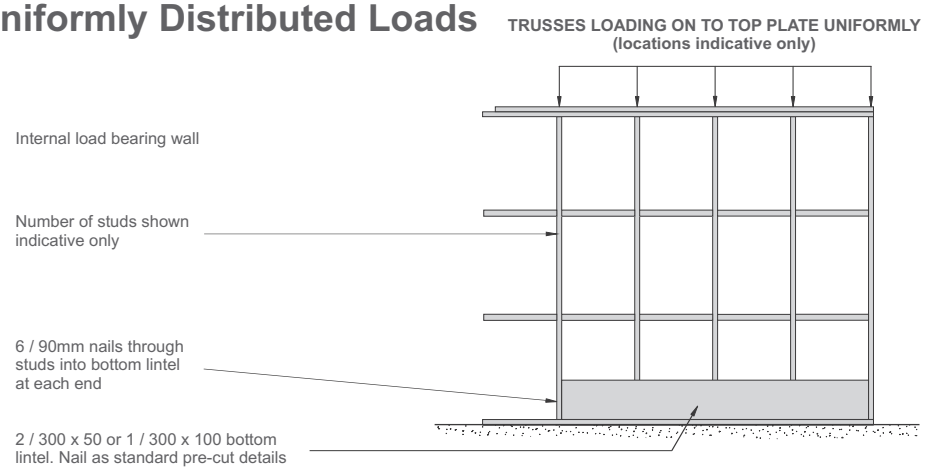
Note:

- Covers slab details where no thickening has been built into the foundation.
- For loads exceeding 10kN install bottom lintel (300x100) between two adjacent studs as detailed below. For loads 30kN or more, special design is required.
- Ensure the studs comply with requirements on page 3 and are located directly under concentrated loads. This may require on-site installation of these studs.

Concentrated Load



Uniformly Distributed Loads



8. WALLS

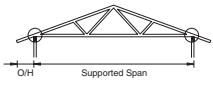
LUMBERLOK®

STUD TO TOP PLATE FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.18 NZS 3604:1999

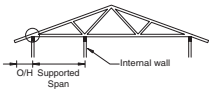
NOTE:

- ★ All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19. NZS 3604:1999 for nailing schedule to resist horizontal loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ Gable end wall top plate/stud connections require only 2 x 90mm x 3.15 dia. nails driven vertically into stud through top plate.
- ★ All fixings assume top plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:1999.

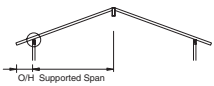
LOADED DIMENSION DEFINITION



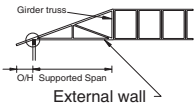
External wall
Standard truss



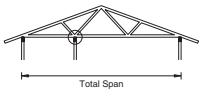
External wall
Internally supported truss



External wall
Rafter roof



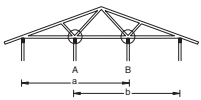
External wall
Jack truss



Internal wall
Internally supported truss
(overhang dimension does not apply)

EXTERNAL WALL
LOADED DIMENSION =
$\frac{\text{SUPPORTED SPAN}}{2}$ + O/H

INTERNAL WALL
LOADED DIMENSION =
$\frac{\text{TOTAL SPAN}}{2}$



Multiple internal walls
(overhang dimension does not apply)

MULTIPLE INTERNAL WALL
LOADED DIMENSION FOR
WALL A = $\frac{a}{2}$
WALL B = $\frac{b}{2}$

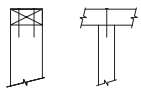
FIXING SELECTION CHART

(Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

Loaded Dimension (m)		Light Roof				Heavy Roof			
Stud Centres		Wind Zone				Wind Zone			
400mm	600mm	L	M	H	VH	L	M	H	VH
2.25	1.5	A	A	B	B	A	A	B	B
3.0	2.0	A	B	B	C	A	A	B	B
3.8	2.5	A	B	C	C	A	A	B	C
4.5	3.0	B	B	C	D	A	A	B	C
5.3	3.5	B	B	C	D	A	A	B	D
6.0	4.0	B	C	D	D	A	A	C	D
6.8	4.5	B	C	D	D	A	B	C	D
7.5	5.0	B	C	D	D	A	B	C	D
8.3	5.5	B	C	D	D	A	B	C	D
9.0	6.0	B	C	D	-	A	B	D	D

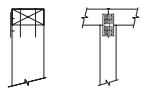
FIXING OPTIONS

FIXING TYPE A 0.7kN



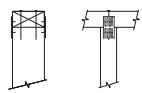
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.

FIXING TYPE B 1.7kN



2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.
Plus
1 x Tylok 2T4 (min.) plate for Radiata Pine
1 x Tylok 2T5 (min.) plate for Douglas Fir

FIXING TYPE C 2.7kN

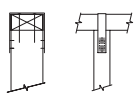


2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.
Plus
2 x Tylok 2T4 (min.) plate for Radiata Pine
2 x Tylok 2T5 (min.) plate for Douglas Fir

FIXING TYPE D 6.0kN

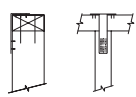
CHOOSE ANY OF THE 4 OPTIONS

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



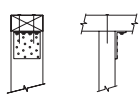
Plus LUMBERLOK Stud Tie

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



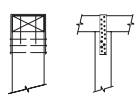
Plus LUMBERLOK Stud Strap

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.

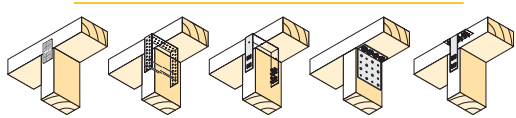


Plus LUMBERLOK 6kN Stud Anchor

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus LUMBERLOK Sheet Brace Strap
(Fix 3 x 30mm x 3.15 dia. nails to each stud face.)



TYLOK 2T4 or TYLOK 2T5 | SHEET BRACE STRAP | STUD TIE | 6kN STUD ANCHOR (CPC80) | STUD STRAP

LUMBERLOK®

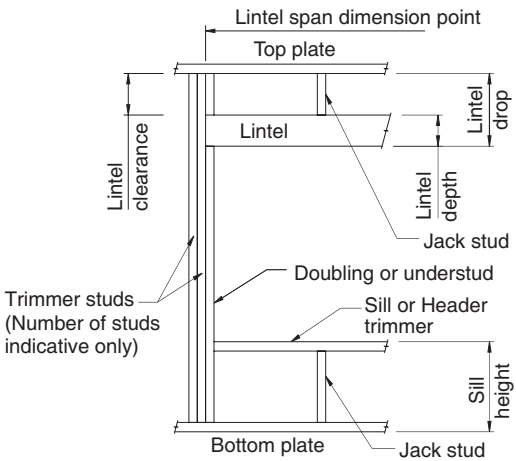
LINTEL FIXING SCHEDULE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:1999

NOTE:

- ★ All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:1999 for nailing schedule to resist horizontal loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ All fixings assume bottom plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:1999.

DEFINITIONS



SELECTION CHART FOR LINTEL FIXING

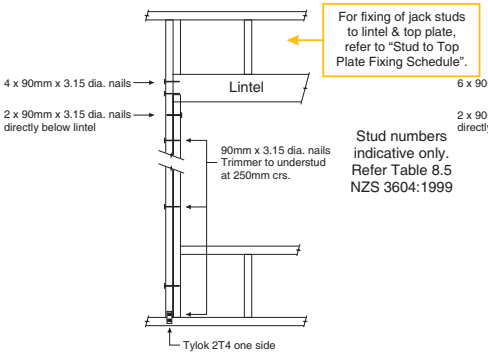
Lintel Span	Loaded Dimension (See Fig. 1.3 NZS 3604:1999)	Light Roof Wind Zone				Heavy Roof Wind Zone			
		L	M	H	VH	L	M	H	VH
1.5	2.0	E	E	F	F	E	E	F	F
	3.0	E	E	F	G	E	E	F	F
	4.0	E	F	G	G	E	E	F	G
	5.0	E	F	G	G	E	E	G	G
	6.0	E	F	G	H	E	E	G	G
2.0	2.0	E	F	F	G	E	E	F	F
	3.0	E	F	G	G	E	E	F	G
	4.0	E	F	G	G	E	E	G	G
	5.0	E	G	G	H	E	E	G	G
	6.0	F	G	G	H	E	F	G	H
2.4	2.0	E	F	F	G	E	E	F	F
	3.0	F	F	G	G	E	E	G	G
	4.0	F	G	G	H	E	E	G	G
	5.0	F	G	G	H	E	F	G	H
	6.0	F	G	H	H	E	F	G	H
3.0	2.0	E	F	G	G	E	E	F	G
	3.0	F	F	G	H	E	E	G	G
	4.0	F	G	G	H	E	F	G	H
	5.0	F	G	H	H	E	F	G	H
	6.0	G	G	H	-	E	F	H	H
3.6	2.0	F	F	G	G	E	E	F	G
	3.0	F	G	G	H	E	F	G	G
	4.0	F	G	H	H	E	F	G	H
	5.0	F	G	H	-	E	F	H	H
	6.0	G	H	H	-	E	F	H	-
4.2	2.0	F	F	G	G	E	E	G	G
	3.0	F	G	H	H	E	F	G	H
	4.0	G	G	H	-	E	F	H	H
	5.0	G	H	H	-	E	F	H	-
	6.0	G	H	-	-	E	G	H	-
4.8	2.0	F	G	G	H	E	E	G	G
	3.0	F	G	H	H	E	F	G	H
	4.0	G	G	H	-	E	F	H	H
	5.0	G	H	-	-	E	F	H	-
	6.0	G	H	-	-	E	G	H	-

NOTES:

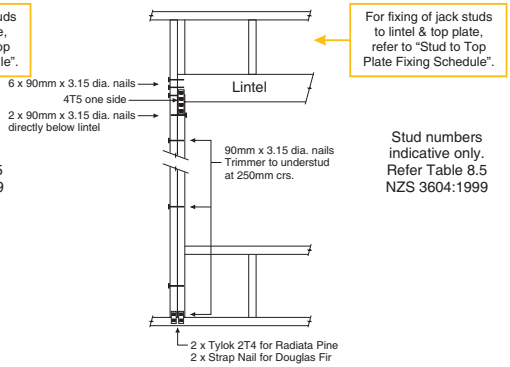
Lintels supporting Girder trusses for ALL load cases use:
Fixing Type G where contributary area = $10m^2$
Fixing Type H where contributary area = $20m^2$
All cases outside this require specific design.

LINTEL FIXING OPTIONS

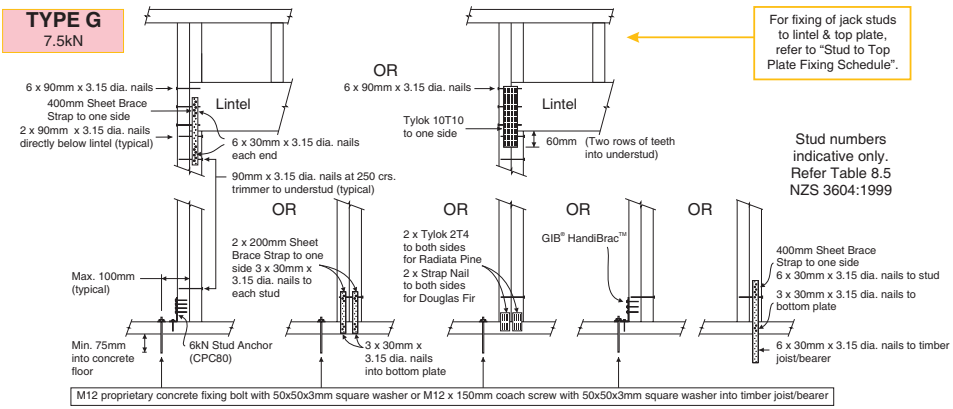
TYPE E
1.4kN



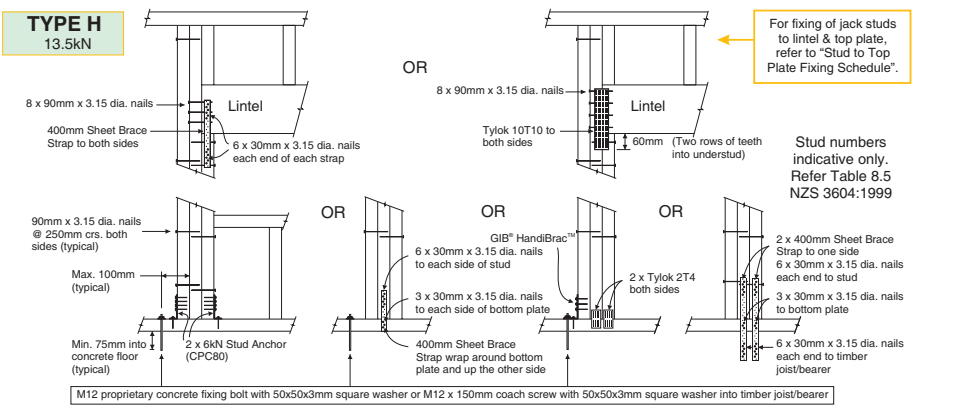
TYPE F
4.0kN



TYPE G
7.5kN



TYPE H
13.5kN



LUMBERLOK®

FLEXIBRACE

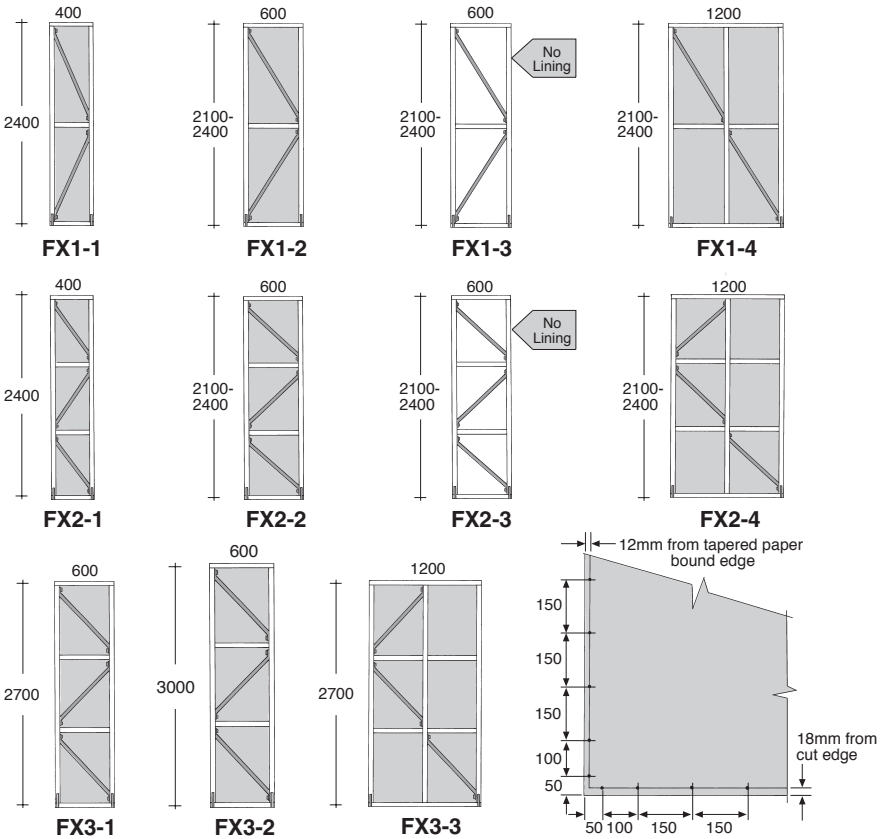
BRACING SERIES - INSTALLATION GUIDE

★ Ensure that you are in receipt of the correct FLEXIBRACE pack prior to installation ie. **FX1**, **FX2** or **FX3.**

★ The installation of this FLEXIBRACE option must correspond with the intended location and wall framing detail as selected by the bracing specifier - ie. stud height, stud centres, number of nogs.

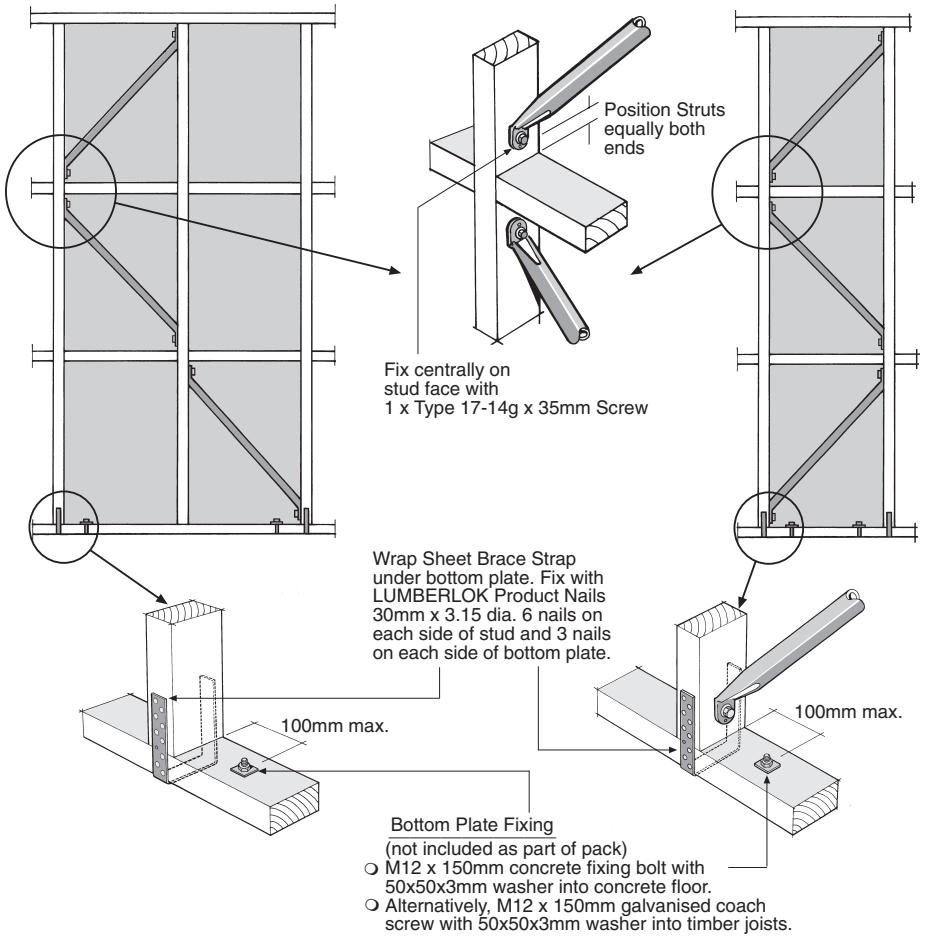
★ The location of each component must be as per drawings below.

★ Ensure that the wall framing is straight and plumb prior to installation.



NB: Use 10mm GIB®standard plasterboard fixed in vertical orientation.
Use the perimeter nail/screw fixing pattern as indicated.

Fixing Details



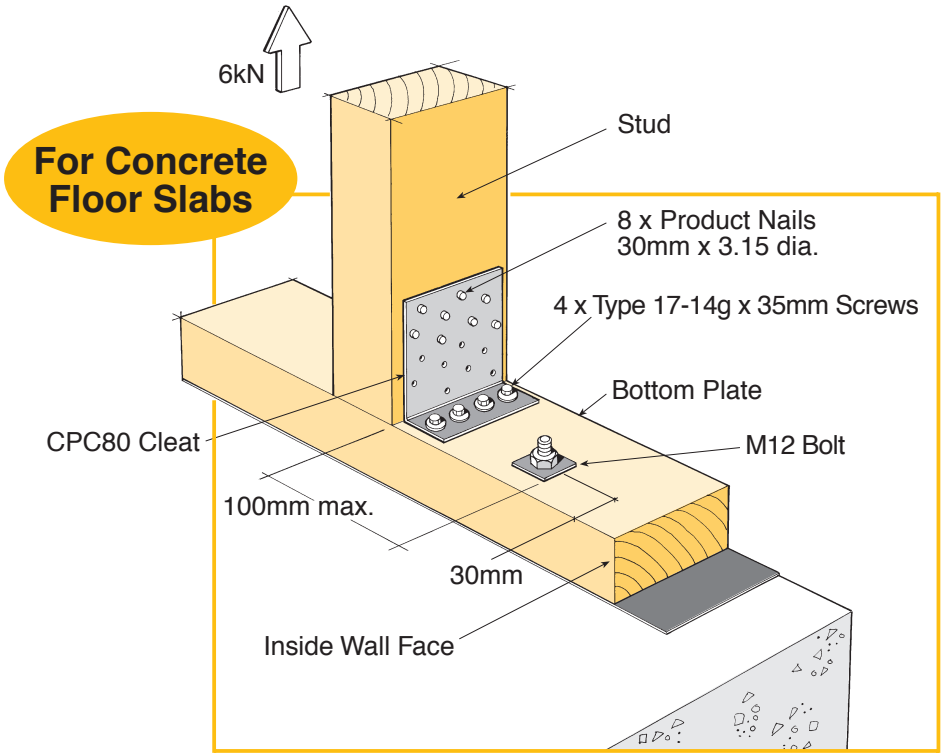
Note: Optional retro fit fixing,use GIB® HandiBrac™ stud to bottom plate fixing.

Pack Contents:
- FLEXIBRACE Struts (2 or 3 as per selection chart)
- Type 17-14g x 35mm Hex Head Galvanised Screws (2 per FLEXIBRACE Strut)
- 2 x 6kN Sheet Brace Straps (400mm)
- 36 x LUMBERLOK Product Nails 30mm x 3.15 dia. for Sheet Brace Straps

LUMBERLOK®

6kN STUD TO BOTTOM PLATE FIXING

- ★ Ideal as retro fit fixing after lining/cladding is installed
- ★ For Firewall situations (single storey garages) refer to reverse side
- ★ Suitable for standard gauge or 35mm kiln dried timbers



Material: CPC80 1.55 G300 Z275 Galvanised Steel
Pack Includes: 2 x CPC80 Cleats
16 x Product Nails 30mm x 3.15 dia. Galvanised
8 x Type 17-14g x 35mm Hex Head Galvanised Screws

Available from leading Builders Supply Merchants throughout New Zealand

LUMBERLOK®

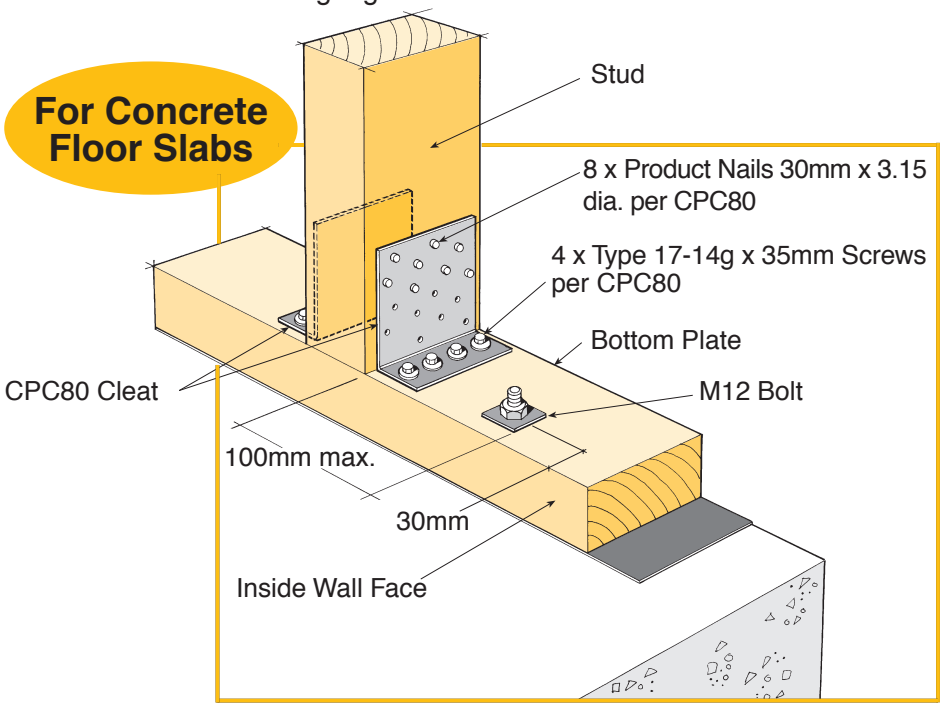
LUMBERLOK®

12kN STUD TO BOTTOM PLATE FIXING

BOUNDARY FIREWALL SITUATIONS - SINGLE STOREY GARAGES

- ★ Designed for 0.5 kPa face loading on wall
- ★ Ideal as retro fit fixing after lining/cladding is installed
- ★ Two fixings per stud as shown
- ★ Suitable for standard gauge or 35mm kiln dried timber

For Concrete Floor Slabs



Material: CPC80 1.55 G300 Z275 Galvanised Steel
Pack Includes: 2 x CPC80 Cleats
16 x Product Nails 30mm x 3.15 dia. Galvanised
8 x Type 17-14g x 35mm Hex Head Galvanised Screws

Available from leading Builders Supply Merchants throughout New Zealand

GIB® HandiBrac™

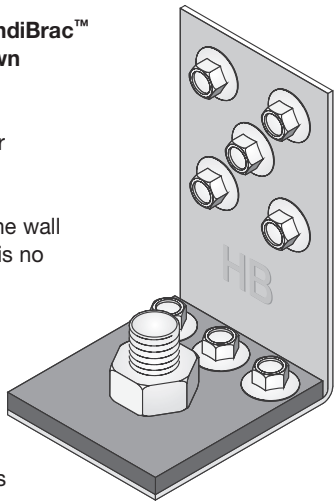
Panel Hold-Down Bracket

- Panel hold-down bracket for use in GIB® BL and UP bracing systems
- Quick and easy to fit
- May be fitted at any stage before lining
- Framing face is clear to allow flush lining
- Easily inspected

GIB® HandiBrac™

Panel Hold-Down Bracket

Developed in conjunction with MiTek™, the GIB® HandiBrac™ has been designed and tested for use as a hold-down bracket in GIB® BL and UP 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

Components

GIB® HandiBrac™ is available in boxes of 10, each containing 5 pairs.
Components per paired pack include:

- 2 x GIB® HandiBrac™ Brackets
- 2 x Washers
- 16 x Tek Screws (8mm AF)

NB: Bolt purchased separately

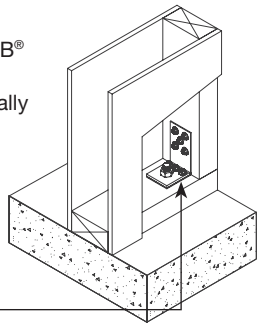
GIB® Bracing Elements

The GIB® HandiBrac™ is a proprietary product that has been tested in, and is suitable only for the following GIB® Bracing systems; GIB Braceline® bracing elements (BL1, BL1a, BLP, BLG) and GIB Ultraline® PLUS Lining Systems bracing elements (UP1, UP1a, UPP, UP2) all have panel hold-down connections at each end of the bracing element.

Panel Hold-down Details

Concrete Floor - Internal Wall
Bottom plate is fixed using M12 galvanised bolt set not less than 75mm into concrete and projecting sufficiently to allow for the washer and fully-threaded nut above the timber.

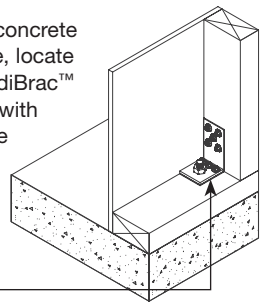
Locate the GIB® HandiBrac™ bracket centrally on the stud



GIB® HandiBrac™ bracket

Concrete Floor - External Wall
Bottom plate is fixed using M12 galvanised bolt set not less than 75mm into concrete and projecting sufficiently to allow for the washer and fully-threaded nut above the timber.

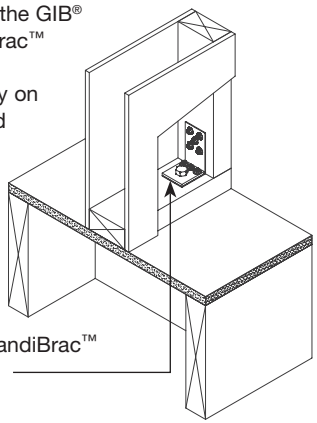
To maximise concrete edge distance, locate the GIB® HandiBrac™ bracket flush with the inside face of the stud



GIB® HandiBrac™ bracket

Timber Floor - Internal Wall
Bottom Plate is fixed using a 12mm diameter minimum 150mm long galvanised coach screw.

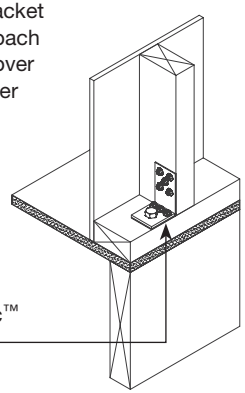
Locate the GIB® HandiBrac™ bracket centrally on the stud



GIB® HandiBrac™ bracket

Timber Floor - External Wall
Bottom Plate is fixed using a 12mm diameter minimum 150mm long galvanised coach screw.

Locate the GIB® HandiBrac™ bracket such that the coach bolt is centred over the joist or bearer below



GIB® HandiBrac™ bracket

GIB® BRACING PANEL HOLD-DOWN FIXINGS

Panel hold-down fixings are required at both ends of the following bracing elements.

- GIB® Bracing Systems 2006; Bracing elements BL1, BL1a, BLP, BLG
- GIB Ultraline® PLUS Lining System 2006; Bracing elements UP1, UP1a, UPP, UP2.
- The washer is an integral part of the GIB® HandiBrac™ design and is supplied as part of the pack. It does not need to be acquired separately.

Fixing to timber framed floors

Bolt fixing to a timber framed floor is with a 150 mm long by 12 mm diameter galvanised coach screw installed in accordance with NZS 3603:1993, Clause 4.5.

Fixing to concrete slabs

The bottom plate at both ends of the bracing element is fixed using an M12 galvanised bolt set not less than 75 mm into concrete and projecting sufficiently to allow a fully threaded nut above the washer. Alternatively, a proprietary fixing with equivalent capacity may be used.

GIB® HandiBrac™ is manufactured and distributed by:

MiTek New Zealand Ltd
Auckland Office:
40 Neales Rd, East Tamaki, Auckland 1701, New Zealand
P O Box 58-014, Greenmount, Auckland 1730, New Zealand
Ph: 64-9-274 7109, Fax: 64-9-274 7100
Christchurch Office:
20 Kotzikas Place, Sockburn, Riccarton, New Zealand
PO Box 8387, Riccarton, New Zealand
Ph: 64-3-348 8691, Fax: 64-3-348 0314
Internet Site: www.miteknz.co.nz

Distributor:

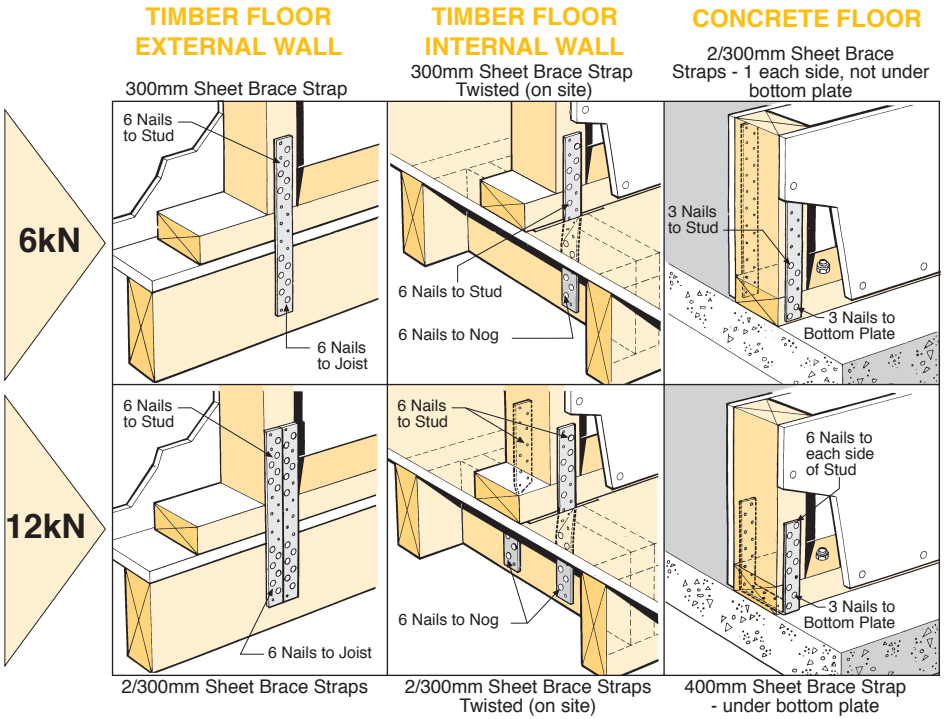
Winstone Wallboards Ltd
National Support:
37 Felix Street, Penrose, Auckland 1061, New Zealand
P O Box 12 256, Penrose 1642, Auckland, New Zealand
Ph: 64-9-633 0100, GIB® Helpline: 0800 100 442
Fax: 64-9-633 0101, Free Fax: 0800 229 222
Email: info@gib.co.nz, Internet Site: www.gib.co.nz

LUMBERLOK®

SHEET BRACE STRAPS

- ★ Comply with NZS 3604:1999
- ★ Provides hold down for all types of sheet bracing
- ★ 6kN and 12kN fixings
- ★ 200, 300, 400 and 600mm lengths
- ★ Quick and easy to apply

USE STAINLESS STEEL OPTION IN EXTERIOR SITUATIONS



- LUMBERLOK Sheet Brace Straps are available in 200, 300, 400 and 600mm lengths. Steel is 25 x 0.91mm pre-galvanised. In addition to a sheet brace hold down, this product can be used for a multitude of 6kN fixing situations, as detailed in NZS 3604:1999.
- Nailing. LUMBERLOK Product Nail - 30mm x 3.15 diameter is recommended.
- Also available in 0.91mm Stainless Steel 304-2B for exterior situations.

Available from leading Builders Supply Merchants throughout New Zealand

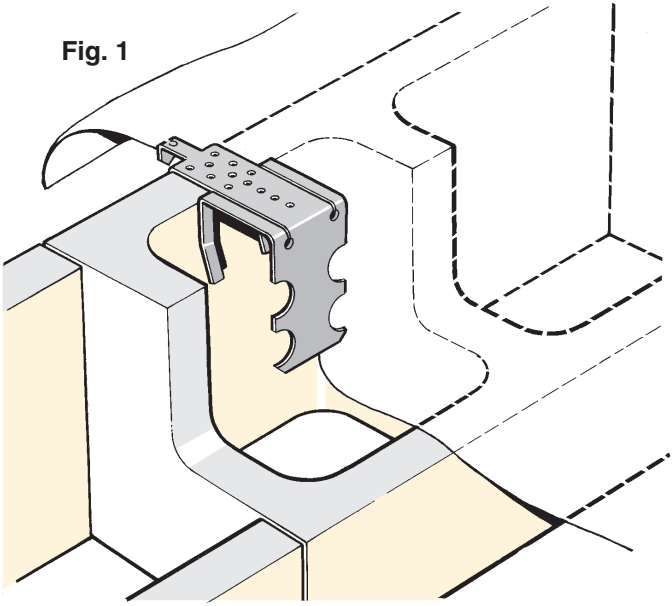
LUMBERLOK®

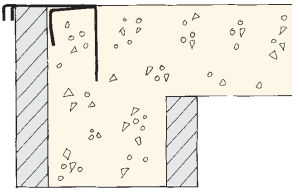
HEADER BLOCK ANCHOR

- ★ For use with concrete header block bases
- ★ Eliminates the drilling of bottom plates
- ★ No need to use Anchor Bolts
- ★ To be located up to 900mm crs.
- ★ Complies with Clause 7.5.12.2 NZS 3604:1999

NZ Pat. Appln. 264928, 270081, 272507

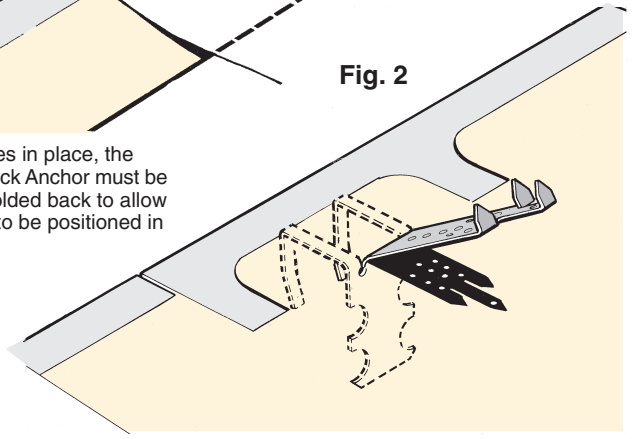
Fig. 1



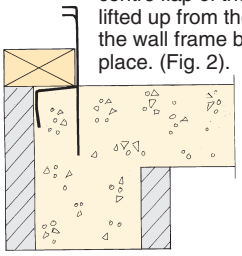


Header Block Anchors are located up to 900mm centres, to the upstand edge of the header blocks, over a continuous vapour barrier (Fig.1). Each Header Block Anchor is positioned on to the blockwork prior to pouring the concrete and should be left undisturbed until the concrete has hardened sufficiently to locate and position the timber frames.

Fig. 2



Prior to positioning the frames in place, the centre flap of the Header Block Anchor must be lifted up from the slab and folded back to allow the wall frame bottom plate to be positioned in place. (Fig. 2).



Available from leading Builders Supply Merchants throughout New Zealand

One LUMBERLOK Product Nail 30mm x 3.15 dia. should then be driven into the inside face of the bottom plate and at least four additional nails applied through the remaining flange, which is either wrapped over the top of the bottom plate or fixed to the face of a stud or block should the Header Block Anchor not line up with the stud. (Fig. 3).

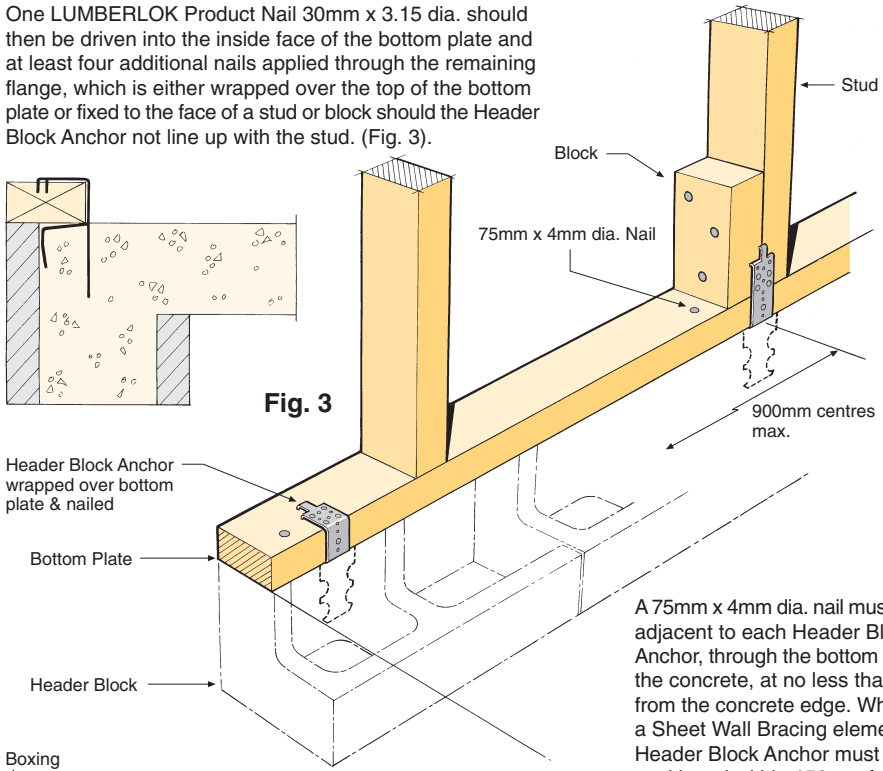


Fig. 3

A 75mm x 4mm dia. nail must be fixed adjacent to each Header Block Anchor, through the bottom plate into the concrete, at no less than 70mm from the concrete edge. When using a Sheet Wall Bracing element, a Header Block Anchor must be positioned within 150mm from the end of that element.

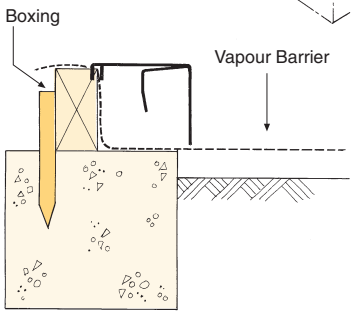
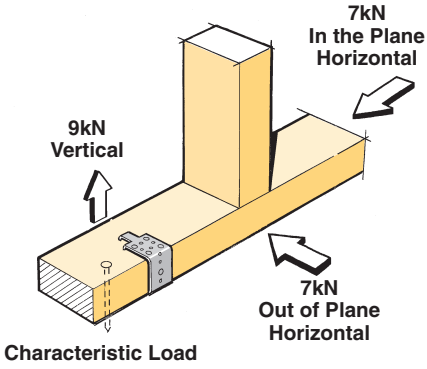


Fig. 4

Header Block Anchors have also been designed to enable them to be used with timber boxing, as opposed to using concrete header blocks. (Fig. 4).
Note however that in this case, the product is fixed around the **inside** face of the bottom plate.



Characteristic Load

Specification

Material - 1.15 G250 Z275 Galvanised Steel
or - Stainless Steel 304-2B
Packaged - 48 per carton

Design Loads

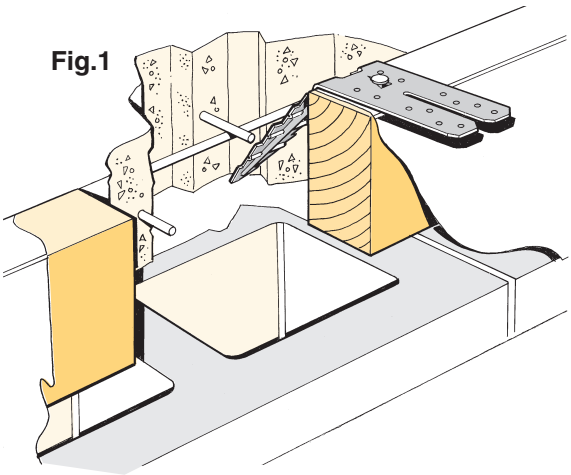
Concrete compressive strength 17 MPa min.

LUMBERLOK®

BOTTOM PLATE FIXING ANCHOR

- ★ Eliminates the drilling of bottom plates
- ★ Makes the fixing of timber framework easier and quicker
- ★ Saves hand trowelling around anchor bolts or rods
- ★ Use at 900mm centres max.
- ★ Complies with Clause 7.5.12.2 NZS 3604:1999

Fig.1



Bottom Plate Fixing Anchors should be located up to 900mm centres to the boxing of concrete floor slabs, over a continuous vapour barrier.
Each Fixing Anchor is fixed prior to pouring the concrete, and should be left undisturbed until the concrete has hardened ready for the timber frames to be installed. (Fig.1).
When the framework is located, the Fixing Anchors are then folded up and over the bottom plate. (Fig. 2).
Two LUMBERLOK Product Nails (30mm x 3.15 dia.) should then be driven into the side of the bottom plate and two additional nails applied through each of the lugs. Should a stud coincide with the position of a Fixing Anchor, nail as shown in Fig. 3.

A 75mm x 4mm diameter nail must be fixed adjacent to each Fixing Anchor, through the bottom plate into the concrete, at no less than 70mm from the concrete edge. When using a Sheet Wall Bracing element, a Fixing Anchor must be positioned within 150mm from the end of that element.

Fig. 3

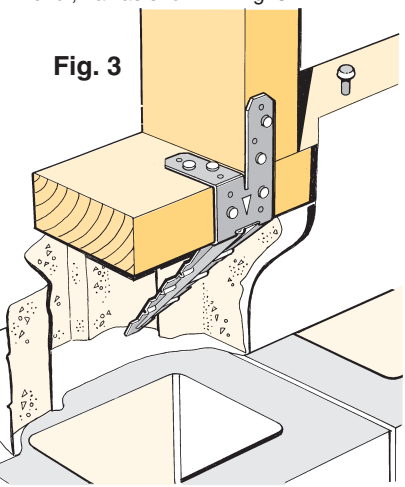
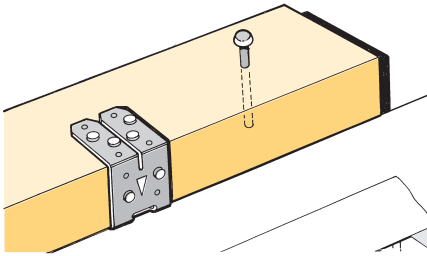
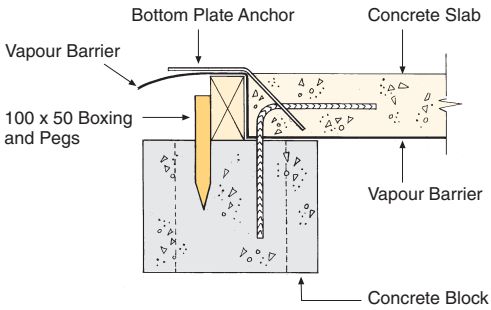
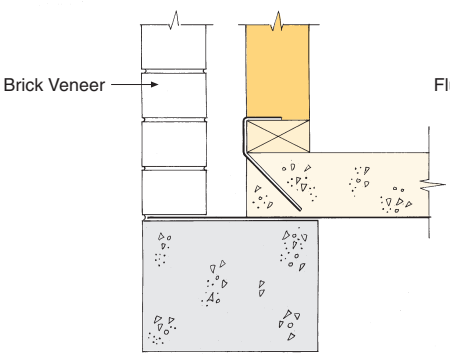


Fig. 2

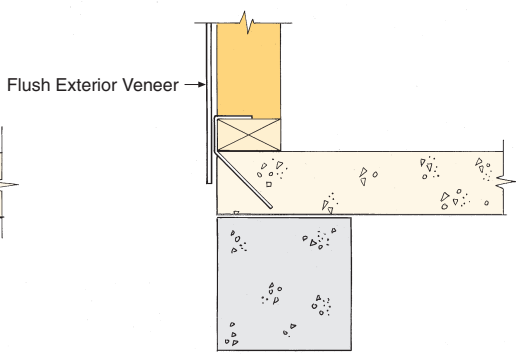


Available from leading Builders Supply Merchants throughout New Zealand





BRICK VENEER



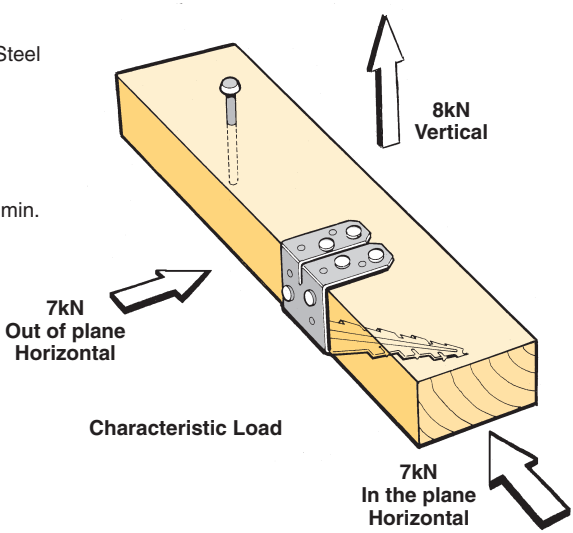
FLUSH VENEER

Specification

Material - 0.95 G300 Z450 Galvanised Steel
or - Stainless Steel 304-2B
Packaged - 50 per carton

Design Loads

Concrete compressive strength 17 MPa min.



LUMBERLOK®

TOP PLATE JOINTING

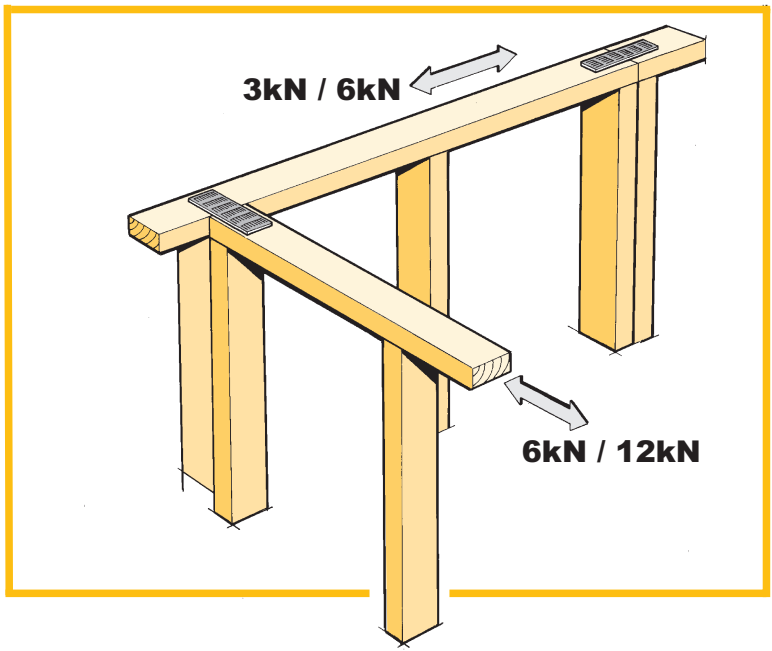
AS PER CLAUSE 8.7.3 NZS 3604:1999

Top Plates at Right Angles

Connection capacity	LUMBERLOK Connector
6 kN	Tylok 6T10 **OR** 2 x Strap Nails
12 kN	2 x Sheet Brace Straps fixed with 6 x LUMBERLOK Product Nails 30mm x 3.15 dia. per end per strap (24 nails total)

Top Plates in Line

Connection capacity	LUMBERLOK Connector
3 kN	Tylok 6T5 **OR** Strap Nail
6 kN	Tylok 6T10 **OR** 2 x Strap Nails

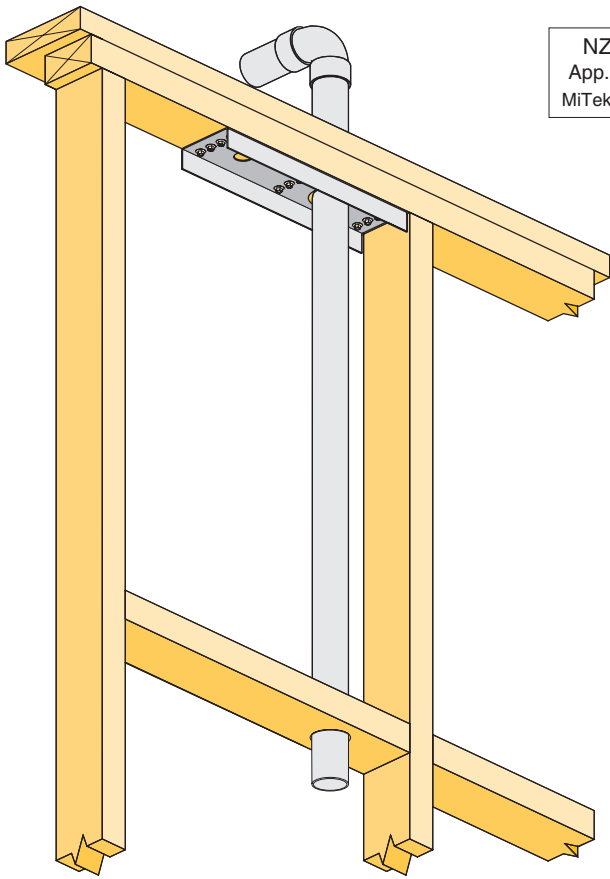


Available from leading Builders Supply Merchants throughout New Zealand

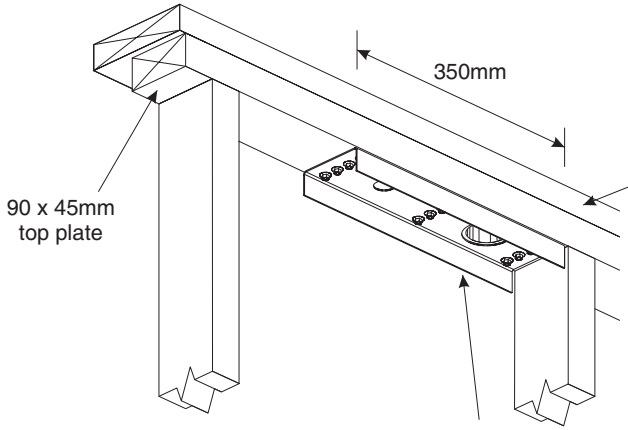
LUMBERLOK®

TOP PLATE STIFFENER

- ★ For internal vacuum systems ducting
- ★ Reinforces the top plate back to FULL STRENGTH!
- ★ Alternative solution to Figure 8.20 NZS 3604:1999

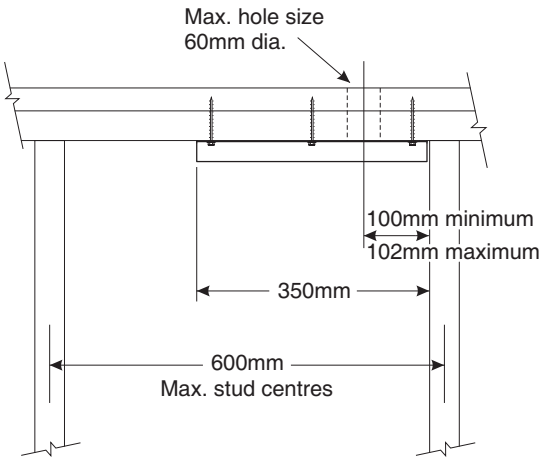


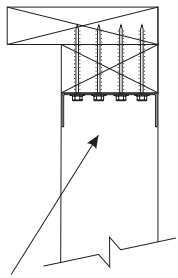
NZ Reg. Design
App. 408133 © 2006
MiTek New Zealand Ltd.



Note:
Use Top Plate Stiffener as template for drilling 60mm hole.

Fix up into top plate and into packer with 3 rows of Type 17-14g x 75mm Hex Head Screws (supplied). It may be advisable to drill pilot hole for each screw to assist installation.





Position Top Plate Stiffener under top plate as shown within the wall frame.

Material: 1.55 G300 Z275 Galvanised Steel
Packed: 8 x Top Plate Stiffeners per Carton
100 x Type 17-14g x 75mm Hex Head Galvanised Screws

9. POSTS

MiTek New Zealand Ltd.

Correspondence from: **AUCKLAND**
40 Neales Road, East Tamaki 2013
PO Box 58-014, Greenmount 2141
Phone: 09-274 7109
Fax: 09-274 7100

CHRISTCHURCH
14 Pilkington Way, Wigram 8042
PO Box 8387, Riccarton 8440
Phone: 03-348 8691
Fax: 03-348 0314

www.miteknz.co.nz

HOME OF **GANG-NAIL®** BUILDING SYSTEMS

Producer Statement - PS1 - Design

ISSUED BY: MiTek New Zealand Ltd

TO BE SUPPLIED TO: Building Consent Authorities in New Zealand

IN RESPECT OF: BOWMAC STRUCTURAL BRACKETS On-site Guide, 2009

AT: Various Locations in New Zealand

MiTek New Zealand Ltd has provided engineering design services in respect of the requirements of Clause B1 of the NZ Building Code for

☐ All ☒ Part only as specified – BOWMAC STRUCTURAL BRACKETS

of the proposed building work.

The selection charts and tables within this guide have been prepared in accordance with **Compliance Documents and Verification Method B1/VM1** of the NZ Building Code and in accordance with sound and widely accepted engineering principles.

On behalf of MiTek New Zealand Ltd, and subject to:

1. The verification of the design assumptions within this guide
2. All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that the use of BOWMAC STRUCTURAL BRACKETS in the proposed building, if constructed in accordance with the drawings, specifications and other documents provided, will comply with the relevant provisions of the Building Code.

MiTek New Zealand Ltd holds a current policy of Professional Indemnity Insurance of not less than $500,000.

On behalf of MiTek New Zealand Ltd Date: January 2009

In Ling Ng
Technical Services Manager
BE (Hons), CPEng, IntPE
MIPENZ (ID: 146585)

DESIGN INFORMATION

TIMBER & DURABILITY

- All structural timber grades to conform to NZS 3603:1993 Amendment 4.
- Timber can be green. Our recommendation is moisture content to be 40% or less at time of fabrication.
- Treatment to NZS 3602:2003

DESIGN LOADS

- Dead loads for Light Roof = 0.25 kPa, Heavy Roof = 0.65 kPa, Ceiling = 0.20 kPa (includes weight of trusses, purlins, associated framing and roofing material).
- Live loads as defined by AS/NZS 1170:2002
- Wind zones as defined by NZS 3604:1999
- Seismic zones A, B or C as per NZS 3604:1999
- Snow loads - **ALL** designs up to 0.50 kPa Snow load unless otherwise noted on drawings.
- Soil conditions - **ALL** foundations to be into natural good ground with a minimum ultimate bearing capacity of 300 kPa.
- Refer to **MiTek New Zealand Ltd** for any design modifications required for increase in snow loads or wind loads above those stated on the drawings.

DESIGN REFERENCES

NZS 3603:1993 AS/NZS 1170:2002
NZS 3604:1999

LOAD DETAILS

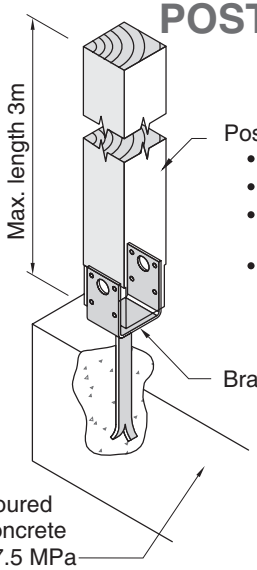
These drawings have been prepared using the above design loads.
It is the responsibility of the user to ensure that the design data and loads are still correct at the time of construction.

PRODUCT SPECIFICATION

These details have been designed using specific **MiTek New Zealand Ltd BOWMAC®** products and the performance of the buildings is reliant on the correct choice of product.

COPYRIGHT

POST & BEARER BRACKETS



Post, maximum specification:

- B132 - 100 x 50mm.
- B133 - 100 x 75mm.
- All other brackets in bracket range across - 100 x 100mm.
- Timber to be minimum No.1 framing grade Radiata Pine or Douglas Fir, treated to NZS 3602:2003.

Bracket (Saddle, Rag Strap or Pipe Insert)

BRACKET RANGE

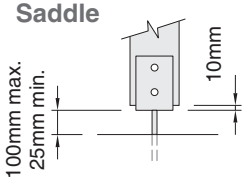
- B12, B14, B16, B18, B25, B28, B75, B78, B79, B132, B133, B134, B135, B138, B195, B196, B197 and B198

FIXING NOTE

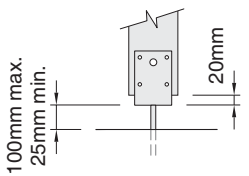
- All bolt holes accommodate M12 Bolt unless noted. Nail holes to accommodate 40mm x 3.15 dia. Flat Head square twisted shank nails. Hot dip galvanised.

TYPICAL USE

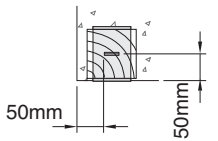
1. Saddle



Bolts Only

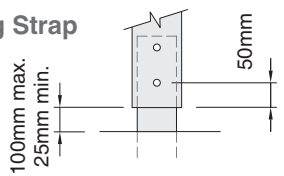


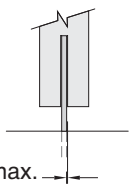
Bolts & Nails

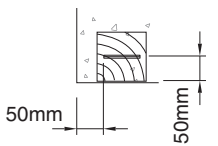


Min. edge distance for bracket stem

2. Rag Strap

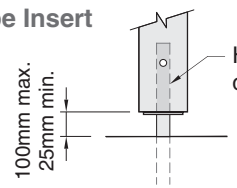


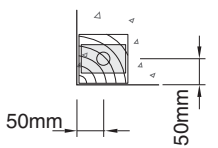




Min. edge distance for bracket stem

3. Pipe Insert

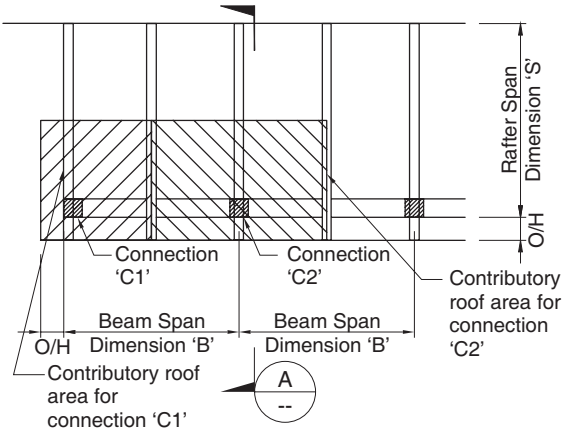


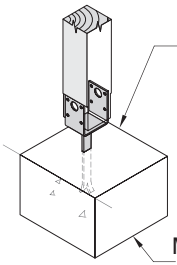


Min. edge distance for bracket stem

ON-SITE FITTED DIMENSIONS

POST & BEARER BRACKETS

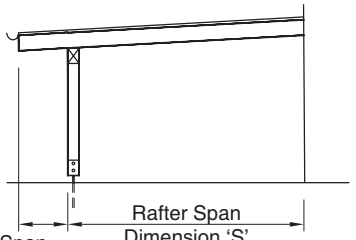




For minimum volume of concrete required for each bracket refer to chart below.

Minimum concrete strength 17 MPa

FOUNDATION DETAILS



SECTION
SCALE: NTS
A
--

EXAMPLE AREAS

- Contributory area on connection 'C1'=(SxB)/4+(O/HxB)/2+(O/HxS)/2+(2xO/H)
- Contributory area on connection 'C2'=(S/2+O/H)xB

LAYOUT & LOAD DIMENSIONS

BRACKET TYPE

- Type 1: B132, B133, and B198
- Type 2: B12, B14, B16, B18, B25, B28, B75, B78, B79, B134, B135, B138, B195, B196 and B197

Roof Weight	Wind	Snow	Max. Roof Area (m^2)	
			Bracket Type 1	Bracket Type 2
Light*	L	0.5	10	13
	M	0.5	8	13
	H	0.7	5	11
	VH	1.0	4	8
Heavy*	L	0.5	7	9
	M	0.5	7	9
	H	0.7	6	8
	VH	1.0	5	7

LOAD TABLE

Roof Weight	Wind	Roof Area Supported (m^2)						
		$2m^2$	$4m^2$	$6m^2$	$8m^2$	$10m^2$	$12m^2$	$14m^2$
Light*	L	0.03	0.07	0.10	0.15	0.15	0.20	0.25
	M	0.05	0.10	0.15	0.20	0.25	0.30	0.35
	H	0.10	0.20	0.30	0.40	0.50	0.60	0.70
	VH	0.13	0.26	0.40	0.50	0.65	0.80	0.95
Heavy*	L & M	No securement required for uplift. Minimum footing of $0.1m^3$ for bracket fixing						
	H	0.05	0.10	0.15	0.20	0.25	0.30	0.35
	VH	0.07	0.13	0.20	0.26	0.32	0.40	0.48

* Refer to NZS 3604:1999 for specific roof weights. (Allowance of roof lining up to $20kg/m^2$ has been made).
Concrete volumes for roof area beyond $14m^2$ can be increased on a pro-rata basis.

MAX. CONCRETE FOOTING VOLUME TABLE

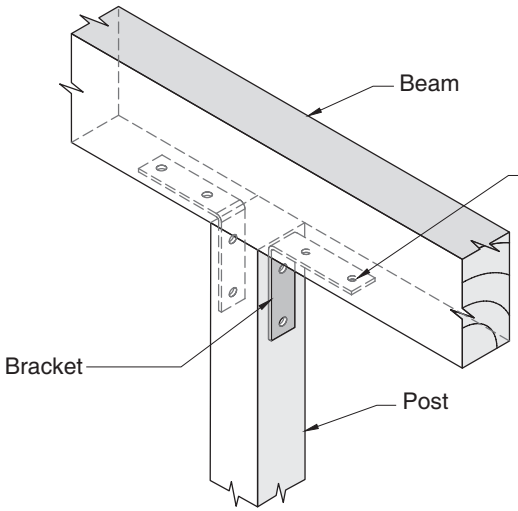
ANGLE BRACKETS WITHOUT GUSSET

BRACKET RANGE

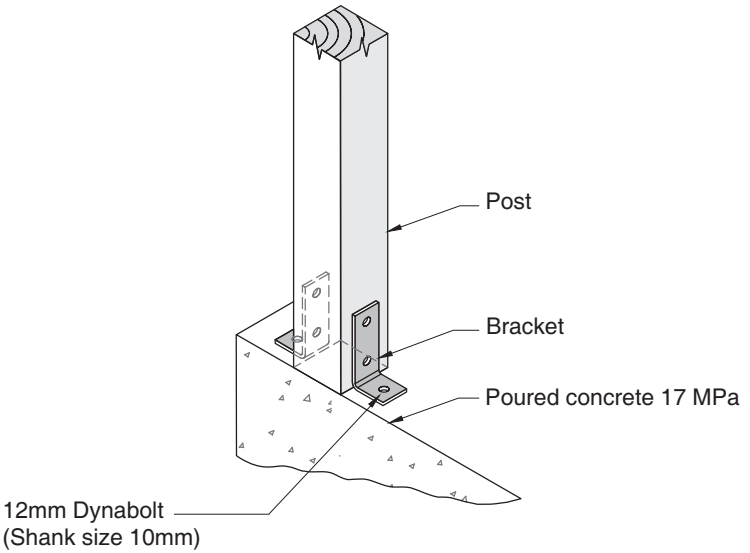
- B51, B52, B53, B54, B55, B58, B351, B352, B353 and B354

FIXING NOTE

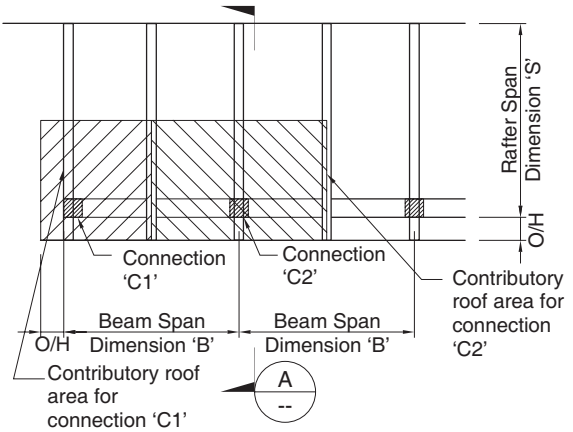
- All bolt holes accommodate M12 Bolt unless noted.

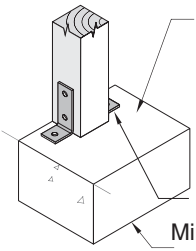


TYPICAL USE

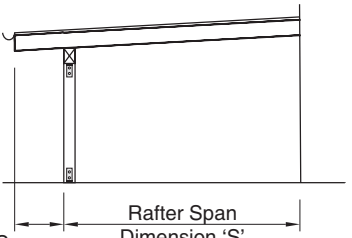


ANGLE BRACKETS WITHOUT GUSSET





FOUNDATION DETAILS



SECTION

SCALE: NTS

A
--

EXAMPLE AREAS

- Contributory area on connection 'C1'=(SxB)/4+(O/HxB)/2+(O/HxS)/2+(2xO/H)
- Contributory area on connection 'C2'=(S/2+O/H)xB

LAYOUT & LOAD DIMENSIONS

BRACKET

B51, B52, B53, B54, B55, B58, B351, B352, B353 and B354

Roof Weight	Wind	Max. Roof Area (m^2)
Light*	L	7
	M	7
	H	6
	VH	4
Heavy*	L	5
	M	5
	H	4
	VH	4

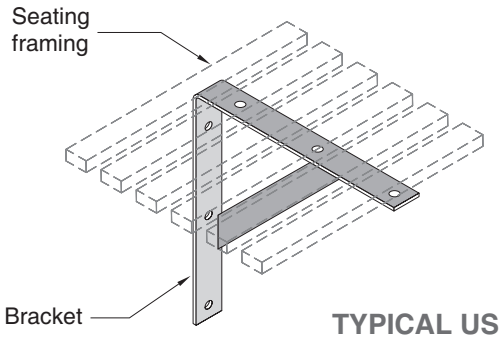
LOAD TABLE

Roof Weight	Wind	Roof Area Supported (m^2)						
		$2m^2$	$4m^2$	$6m^2$	$8m^2$	$10m^2$	$12m^2$	$14m^2$
Light	L	0.03	0.07	0.10	0.15	0.15	0.20	0.25
	M	0.05	0.10	0.15	0.20	0.25	0.30	0.35
	H	0.10	0.20	0.30	0.40	0.50	0.60	0.70
	VH	0.13	0.26	0.40	0.50	0.65	0.80	0.95
Heavy	L & M	No securement required for uplift. Minimum footing of $0.1m^3$ for bracket fixing						
	H	0.05	0.10	0.15	0.20	0.25	0.30	0.35
	VH	0.07	0.13	0.20	0.26	0.32	0.40	0.48

* Refer to NZS 3604:1999 for specific roof weights. (Allowance of roof lining up to $20kg/m^2$ has been made).
Concrete volumes for roof area beyond $14m^2$ can be increased on a pro-rata basis.

MAX. CONCRETE FOOTING VOLUME TABLE

ANGLE BRACKETS WITH GUSSET



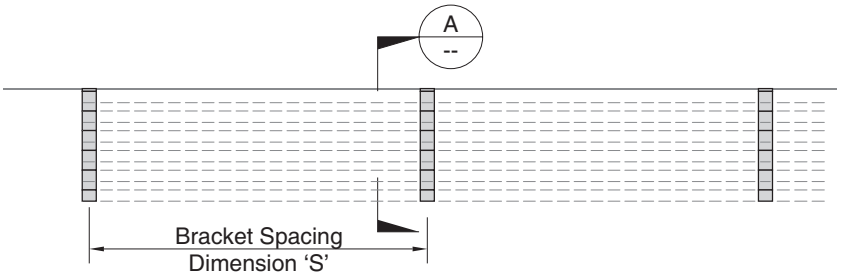
BRACKET RANGE

- B163 and B165

FIXING NOTE

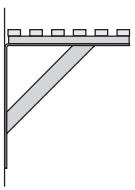
- All bolt holes accommodate M12 Bolt unless noted.

TYPICAL USE



SEATING LOAD

- Bracket designed to carry live load of 3.0 kPa.



SECTION A --

SCALE: NTS

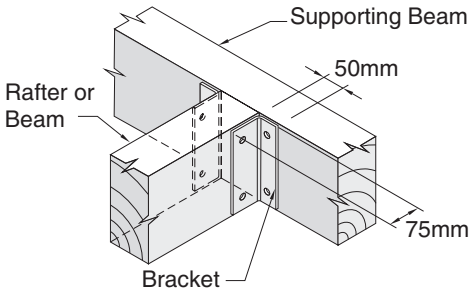
BRACKET SPACING TABLE

Bracket	Max. Spacing 'S'
B163	2.0m
B165	2.0m

LOAD NOTE:

- Bracket selection for B163 & B165 is dependant on seating width only. The same unit load applies to both brackets.

HEAVY DUTY SHORT ANGLE BRACKETS



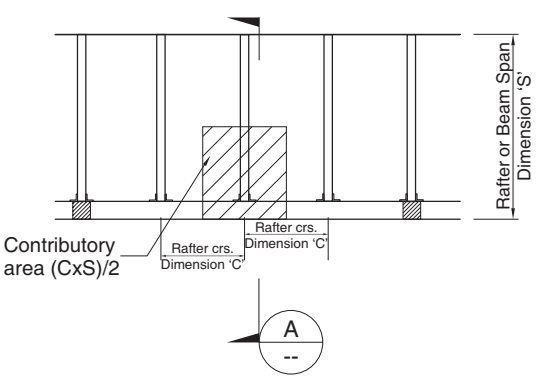
BRACKET RANGE

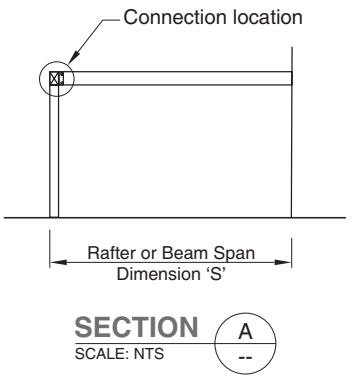
- Bracket Type 1: B175, B176 and B177
- Bracket Type 2: B178 (holes for M16 Bolt)

FIXING NOTE

- All bolt holes accommodate M12 Bolt unless noted.

TYPICAL USE





SECTION A --
SCALE: NTS

LAYOUT & LOAD DIMENSIONS

Roof Weight	Wind	Snow	Max. Roof Area (m^2) Bracket Type 1	Max. Roof Area (m^2) Bracket Type 2
Light	L	0.5	7	9
	M	0.5	7	9
	H	0.7	6	8
	VH	1.0	4	6
Heavy	L	0.5	5	6
	M	0.5	5	6
	H	0.7	4	6
	VH	1.0	4	5

LOAD TABLE

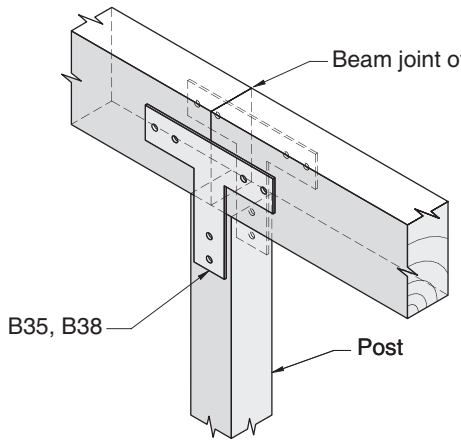
STRAP, T & L BRACKETS

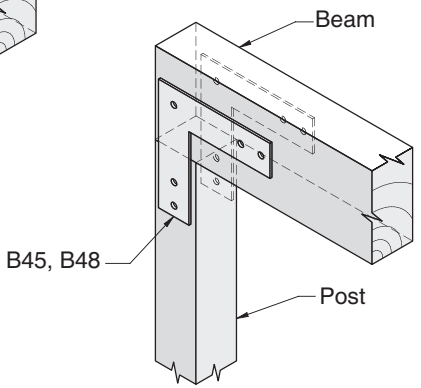
BRACKET RANGE

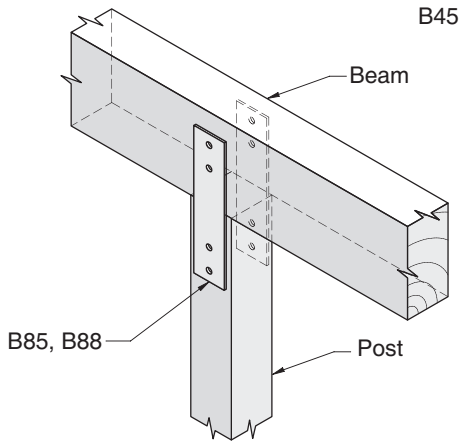
- B35, B38 (T)
  B45, B48 (L)
  B85, B88 (Strap)

FIXING NOTE

- All bolt holes accommodate M12 Bolt unless noted.





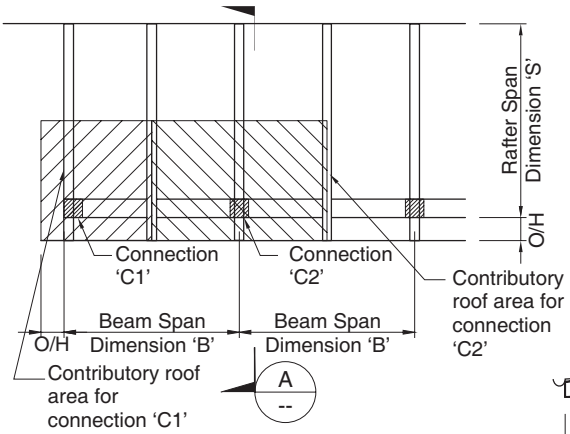


NOTE:

- All T's, L's & Straps have two width selections of 50mm and 75mm. Loads for each width are the same, thus the choice of width is cosmetic only, i.e. 75mm width looks best on 150mm wide timber.

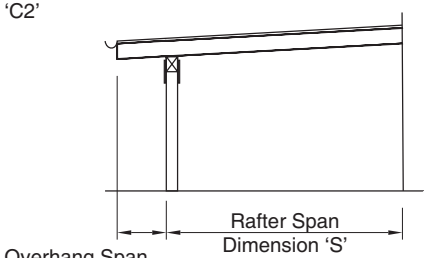
TYPICAL USE

STRAP, T & L BRACKETS



EXAMPLE AREAS

- Contributory area on connection 'C1'=(SxB)/4+(O/HxB)/2+(O/HxS)/2+(2xO/H)
- Contributory area on connection 'C2'=(S/2+O/H)xB



LAYOUT & LOAD DIMENSIONS

DESIGN NOTE:

- The loads shown in the table are vertical in direction and principally upwards, i.e. wind loads.
- Design assumes connections each face of timber post & beams.

Roof Weight	Wind	Snow	Max. Roof Area All Brackets (m^2)
Light	L	0.5	7
	M	0.5	7
	H	0.7	6
	VH	1.0	4
Heavy	L	0.5	5
	M	0.5	5
	H	0.7	4
	VH	1.0	4

LOAD TABLE

10. ROOF FRAMING

INSTALLATION

GANG-NAIL®

General

The roof trusses you are about to install have been manufactured to precise engineering standards. To ensure that the trusses perform as designed, it is essential that they be handled, erected and braced correctly. The following recommendations apply to roof trusses on standard domestic buildings with roof truss details given by the MiTek 20/20™ truss design program. Details for commercial, industrial and non-standard domestic buildings are to be provided by the Engineer responsible for overall building design.

Design

1. Trusses are designed for normal residential roof, ceiling, snow and wind loads to suit specific jobs and conditions. Additional loading such as Solar Units, Hot Water Tanks and Air Conditioning requires special consideration. Advice should be sought from the truss fabricator prior to commencing construction.
2. Wall frames and beams supporting trusses must be designed for the correct roof loads. Refer NZS 3604:1999 Timber Framed Buildings or the GANG-NAIL range of beams and lintels.
3. Wind load is an important loading condition in the design and performance of roof trusses. Ensure that you have correctly advised the truss fabricator with regard to wind load requirements and that adequate provision has been made to fix trusses to the supporting structure to withstand wind uplift forces.
4. Trusses are usually designed to be supported on the outer wall with internal walls being non-load bearing. Internal walls may be used to control deflections and reduce the camber required. Where it is necessary to use internal walls for load bearing, these will be clearly shown on the layout.
5. Before ordering trusses, ensure that your particular requirements have been provided for and that all relevant information has been supplied to the truss manufacturer. If non-standard trusses are being used, ensure that erection and bracing details are known before erection commences.
6. For environments where the atmosphere may be conducive to corrosion, such as some types of industrial and agricultural buildings, or buildings near the ocean and subject to salt spray, consideration should be given to the use of stainless steel connector plates.

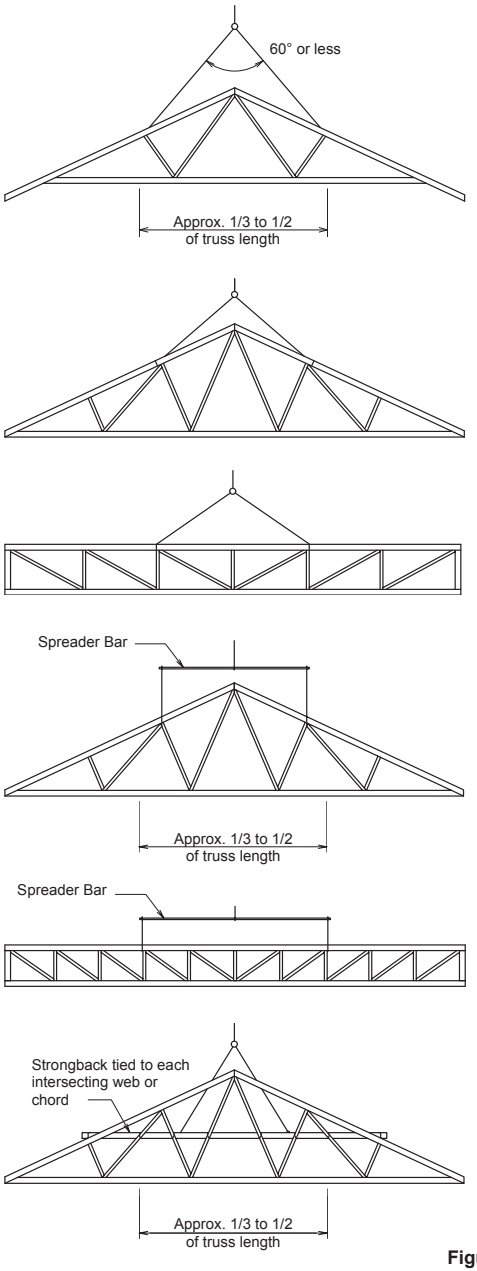
Important Note

1. It is the Builder's responsibility to ensure that all relevant information required for the design is provided to the fabricator at time of ordering trusses, including spans, pitches, profiles, quantities and loading. Final confirmation of dimensions and details between the fabricator and builder is recommended prior to manufacture.
2. It is the responsibility of the principal to ensure that all provisions of the Health and Safety Act are complied with during the installation of GANG-NAIL timber trusses.
3. Trusses are designed for specific loading, geometry and support conditions. Under no circumstances should the truss timber be cut, removed or trusses modified in any way without prior approval from the truss fabricator.
4. Make sure all bracing is permanently fixed and all bolts and brackets are tightened prior to the laying of roof.

Transport

Trusses must be fully supported when being transported in either a horizontal or vertical plane. Care must be taken when tying down not to put strain on chords or webs.

Timber or metal right angle protectors are a satisfactory method of avoiding damage. Unloading and handling as described below.



Job Storage and Lifting

Trusses should be inspected on arrival at site. Any damaged trusses should be reported immediately and not site repaired without approval of the truss fabricator.

Where it is anticipated that trusses will be stored on site for an extended period of time before use, adequate provision should be made to protect the trusses against the effects of weather. Protective covering should allow free air circulation around trusses.

Trusses when stored on the job site should be on timber billets clear of the ground and in flat position to avoid distortion.

When lifting, care must be taken to avoid damaging joints and timber. Spreader bars with attachment to the panel points are recommended where span exceeds 9000mm. Never lift by the apex joint only.

The trusses may also be placed on the top plates by pulling them up skids, spread at 3000mm, taking the same precaution as described above. Ensure that the trusses are not distorted or allowed to sag between supports.

The recommended method of lifting trusses will depend on a number of factors, including truss length and shape.

In general, sling the truss from top chord panel points as shown in (Fig 1). Slings should be located at equal distance from truss centreline and be approximately 1/3 to 1/2 the truss length apart.

Chains and hooks should not be used for lifting as these can damage the chords and plates. Polyester web slings are recommended.

The angle between the sling legs should be 60º or less and where truss spans are greater than 9000mm it is recommended that a spreader bar or strongback be used. Some typical examples are shown in (Fig 1).

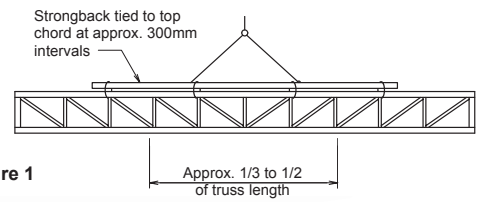
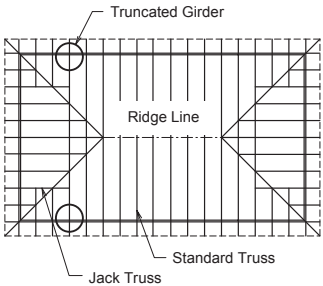


Figure 1

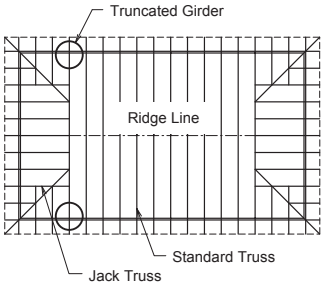
Roof Layout

A layout for trusses must be determined before erection. If in doubt consult your truss fabricator.

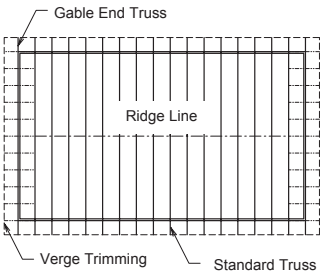
Hip End



Semi Gable

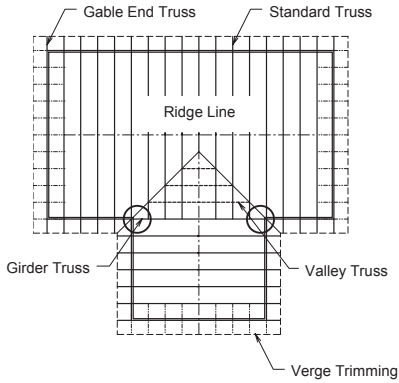


Gable



Note: Gable End Truss to be located over end wall unless otherwise advised by supplier.

T Shaped



L Shape

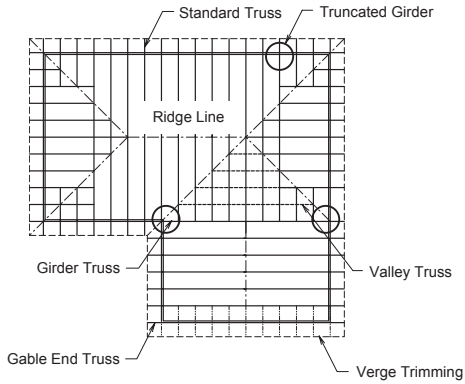


Figure 2

Points circled on these layouts may be critical. Refer to the Wall Frame Construction Notes.

Wall Frame Construction

The load bearing frames should be checked for:

1. Lintel sizes suitable for truss loading. Consult NZS 3604, the GANGLAM Beam Manual, the TRIFOLD Manual, the GANG-NAIL FLITCH BEAM Manual or your truss fabricator.
2. If trusses are not located directly over the studs the top plate size must be in accordance with NZS 3604 or be reinforced in accordance with NZS 3604.
3. Girder trusses may require the strengthening of studs at the points of support. Check the loading with your truss fabricator. Points circled on the layout notes are critical.
4. The supporting structure construction must be adequate to resist wind uplift forces and must be fully braced, plumb and nailed home before the erection of trusses is commenced.

Erection and Fixing

It is convenient to mark the truss position on the wall plates before lifting the trusses. Use the layout drawing as your guide and note that the truss design spacing must not be exceeded.

Gable Roofs – start with a gable truss at each end, fixing it to the top plate at the position marked. These trusses must be temporarily braced back to the ground or frame at the panel points.

Hip or Semi Gable – start with the semi gable girder truss or the truncated girder, placing it on the top plate at the position marked and temporarily bracing it back to the frame. Locate hip and jack trusses and adjust girder truss position before fixing.

Line – Using a stringline along the apex (Fig 3), place each intermediate truss and fix it to the top plate at the position marked, spacing it with gauging rods and ties (Fig 6).

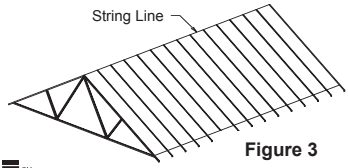


Figure 3

All trusses should be fixed to top plates and girder trusses in accordance with NZS 3604 or the specific roof truss design.

Camber

Trusses are usually manufactured with a camber built in. The camber is designed to give a flat ceiling and even roofline under long term loading. The camber is progressively taken up as the load from the roof covering and ceiling is applied. Under no circumstances should trusses be supported along the span (unless designed for) by blocking or propping.

If a truss has been designed to be supported internally a **"SUPPORT HERE"** label is affixed at the appropriate point.

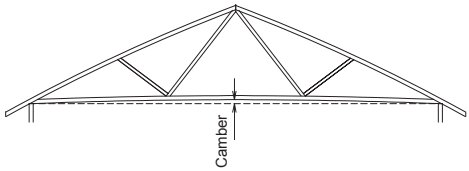


Figure 4

Erection Tolerances

Tolerance is critical for both a good roofline and effective bracing. A string line, plumb line or level should be used.

1. Trusses should be erected with overall bow or bow in any chord not to exceed the lesser of L/200 or 50mm (L is the chord length).
2. Trusses should be erected with the apex not more than the lesser of the span/200mm or 50mm from a vertical plane through the supports.
3. No section of the truss should not be out of plumb by the truss height/50 or max. 50mm.

Generally if a bow or tilt is evident to the eye, the truss has been erected outside the tolerances. See (Fig 5).

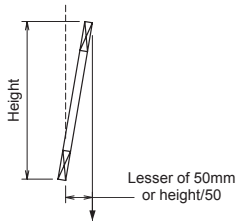
Erection Bracing

The trusses must be braced during erection. If this is not done, then two problems can occur.

1. Collapse during erection.
2. Erection tolerance will be exceeded, causing overloading, buckling and possible permanent damage.

The exact details of erection bracing will, for practical purposes, differ from job to job. The following recommendations are for guidance only as the details employed are the responsibility of the erector.

Plumb



Bow

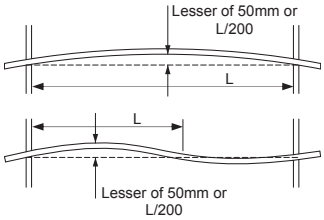


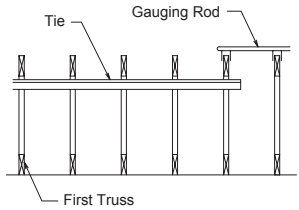
Figure 5

The first truss should be erected straight and plumb to erection tolerances given previously and temporarily braced to a rigid element, e.g. wall or ground as shown on (Fig 6).

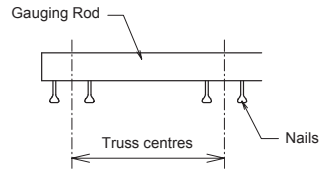
Each successive truss should be spaced using a gauging rod, then fixed back to the first truss with temporary ties at each top chord panel point or at maximum spacing of 3000mm, and to bottom chord at 4000mm max. spacing.

Use 50 x 25 ties for trusses up to and including 900mm centres and 70 x 35 ties for trusses up to 1800mm centres. Fix ties to each truss with one 3.75 diameter nail. Splice by lapping over 2 adjacent trusses.

The purpose of installing temporary bracing is to hold trusses straight and plumb prior to fixing permanent bracing. Temporary bracing is particularly important when the roof cladding is shingles on ply without purlins. All permanent bracing, ties, hold downs, etc. must be fixed prior to laying of roof.



Locate and space each truss using Gauging Rod



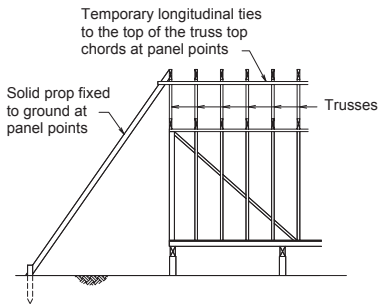


Figure 6

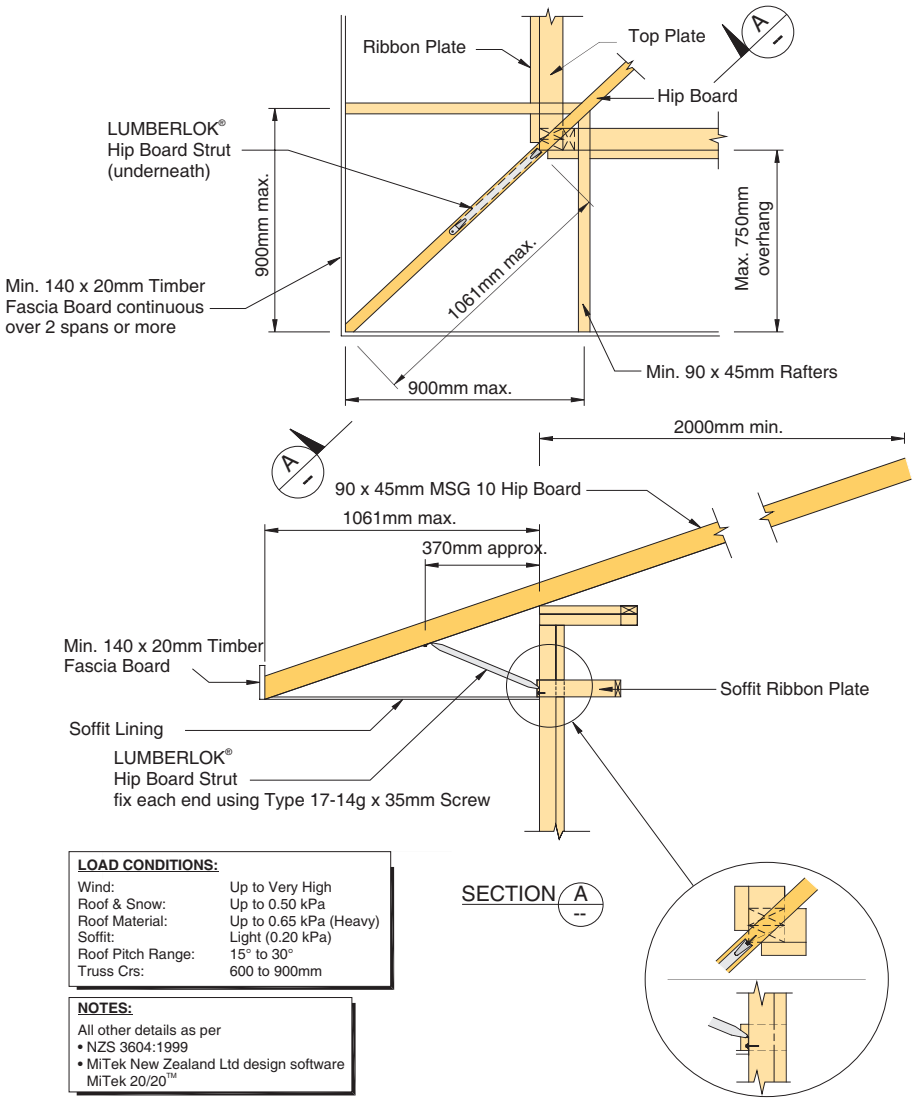
Important Note

These recommendations are a guide only for the erection of residential roof trusses up to 13000mm span and spaced at centres not exceeding 1200mm. For trusses beyond these conditions, consult your truss fabricator.

LUMBERLOK®

HIP BOARD STRUT

SUPPORTING EXCESSIVE OVERHANGS



LOAD CONDITIONS:

Wind:	Up to Very High
Roof & Snow:	Up to 0.50 kPa
Roof Material:	Up to 0.65 kPa (Heavy)
Soffit:	Light (0.20 kPa)
Roof Pitch Range:	15° to 30°
Truss Crs:	600 to 900mm

NOTES:

All other details as per
- NZS 3604:1999
- MiTek New Zealand Ltd design software MiTek 20/20™

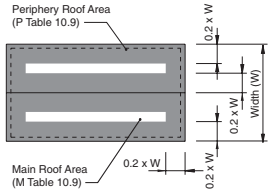
LUMBERLOK®

PURLIN & BATTEN FIXING CHART

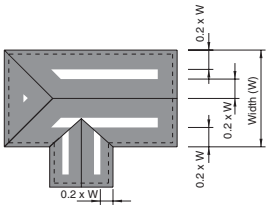
ALTERNATIVE SOLUTION TO NZS 3604:1999

NOTE:

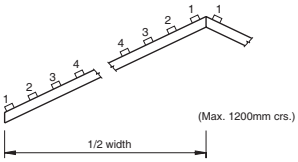
- ★ Maximum overall roof truss span 12m.
- ★ All purlin and batten sizes as per NZS 3604:1999, incorporating Amendments 1 and 2, May 2006, Table 10.9.
- ★ These fixings assume purlins or battens are fixed on top of truss or rafter.
- ★ This chart is used only when specifying the LUMBERLOK BLUE SCREW. The LUMBERLOK BLUE SCREW is different to the purlin screw quoted in Table 10.10 NZS 3604:1999.
- ★ The LUMBERLOK BLUE SCREW requires a minimum of 30mm penetration into the truss chord or rafter to provide the loads as specified.



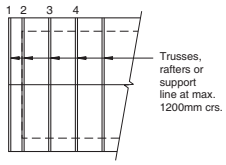
GABLE ROOF



HIP & VALLEY ROOF



PURLIN LAYOUT



LAYOUT ON GABLE END

SELECTION CHART

(minimum fixing requirements)

1. HEAVY ROOFS

All purlins and/or battens use fixing Type A only on roof width (W) up to 12m.

2. LIGHT ROOFS

2.1 BATTENS

- Max. span 1200mm
- Max. crs. 400mm
- Roof width (W) up to 12m

L and M wind loads use Type B fixing on all battens.

H and VH wind loads use Type C on all battens.

2.2 PURLINS - Max. span 900mm, max. crs. 900mm

L and M wind loads use Type C fixing on purlin No. 2 and Type B on all other purlins for all roof widths (W) up to 12m.

H and VH wind loads

1. On roof width (W) up to 8m – use Type D fixing on purlin No. 2 and Type C on all other purlins.

2. On roof width (W) up to 12m – use Type D fixing on purlins No. 2 and 3 and Type C on all other purlins.

2.3 PURLINS AND BATTENS ON GABLE END

- Max. span 900mm, max. crs. 900mm

L and M wind loads use Type B fixing on support line No. 1, Type C on support lines No. 2, 3 and 4 and all other support lines as per Section 2.1 or 2.2 above.

H and VH wind loads use Type C fixing on support line No. 1, Type D on support lines No. 2, 3 and 4 and all other support lines as per Section 2.1 or 2.2 above.

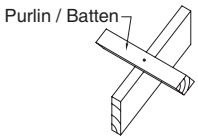
STANDARD FIXING OPTIONS

FIXING DEFINITIONS

NAIL = Either 90mm x 3.15 dia. power driven or 100mm x 3.75 dia. hand driven
SCREW = 80mm x 10 gauge LUMBERLOK BLUE SCREW
WIREDOG = Either left hand or right hand LUMBERLOK Wire Dog

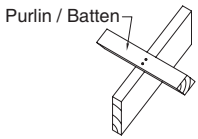
FIXING TYPE A
0.40kN

1 NAIL



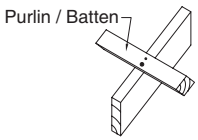
FIXING TYPE B
0.70kN

2 NAILS



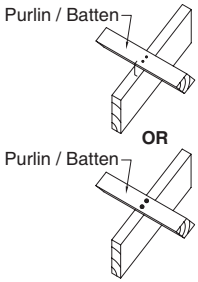
FIXING TYPE C
1.80kN

1 NAIL + 1 SCREW

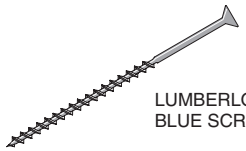


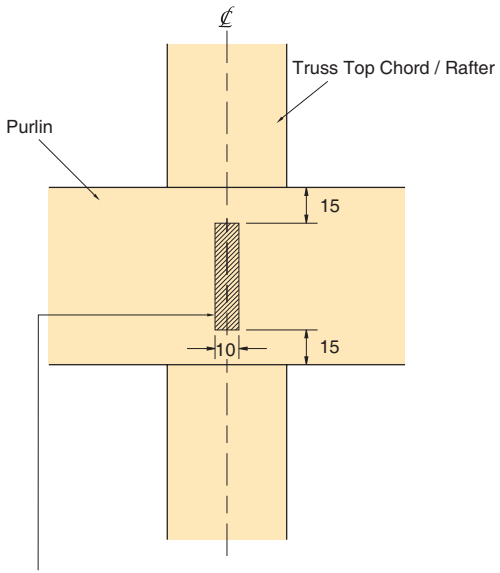
FIXING TYPE D
2.70kN

2 NAILS + 1 WIRE DOG
OR
2 SCREWS



BLUE SCREW
FIXING TOLERANCE



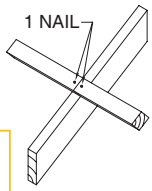


NOTE:
Locate fixings within the shaded area.
Care to be taken to avoid over tightening of screws.

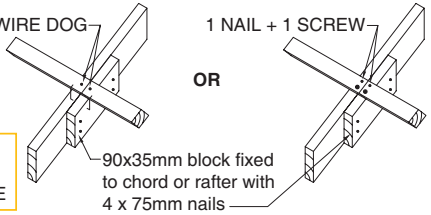
PURLIN / BATTEN SPLICE FIXING OPTIONS

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

FIXING TYPE A & B OVER PURLIN SPLICE



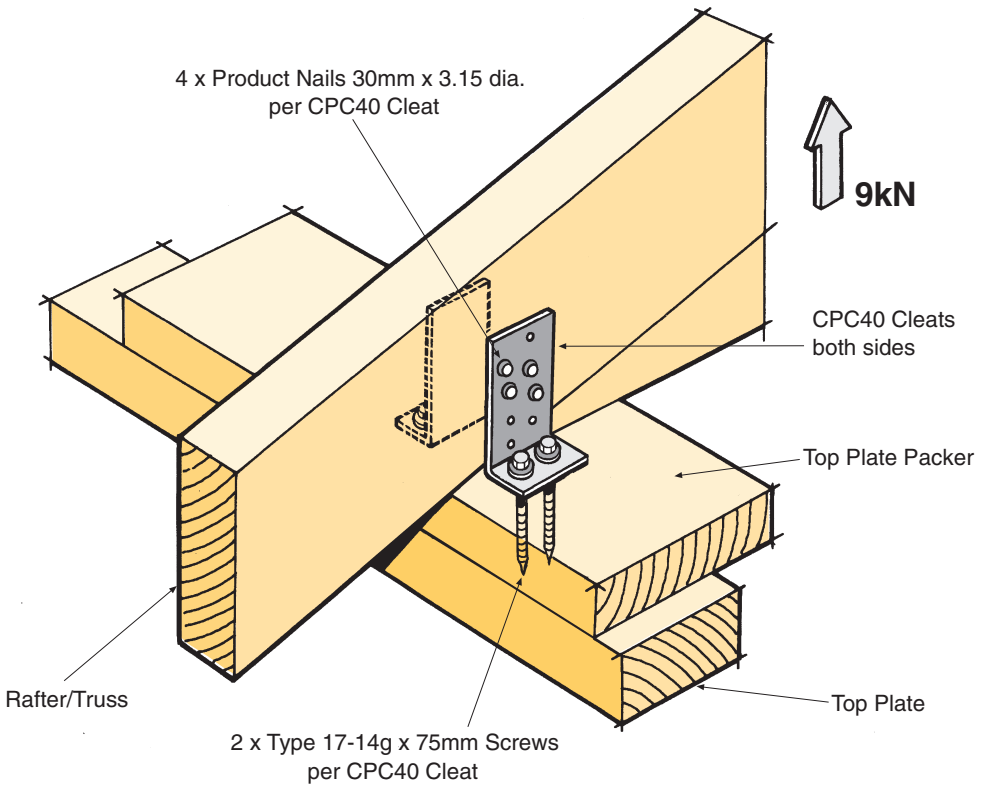
FIXING TYPE C & D OVER PURLIN SPLICE



LUMBERLOK®

9kN TRUSS TO TOP PLATE FIXING

★ Complies with Table 10.13 NZS 3604:1999
★ Top mounted fixing allows additional face fixing if required



Code: 9kNTTP
Material: CPC40 1.55 G300 Z275 Galvanised Steel
Pack Includes: 2 x CPC40 Cleats
8 x Product Nails 30mm x 3.15 dia. Galvanised
4 x Type 17-14g x 75mm Hex Head Galvanised Screws

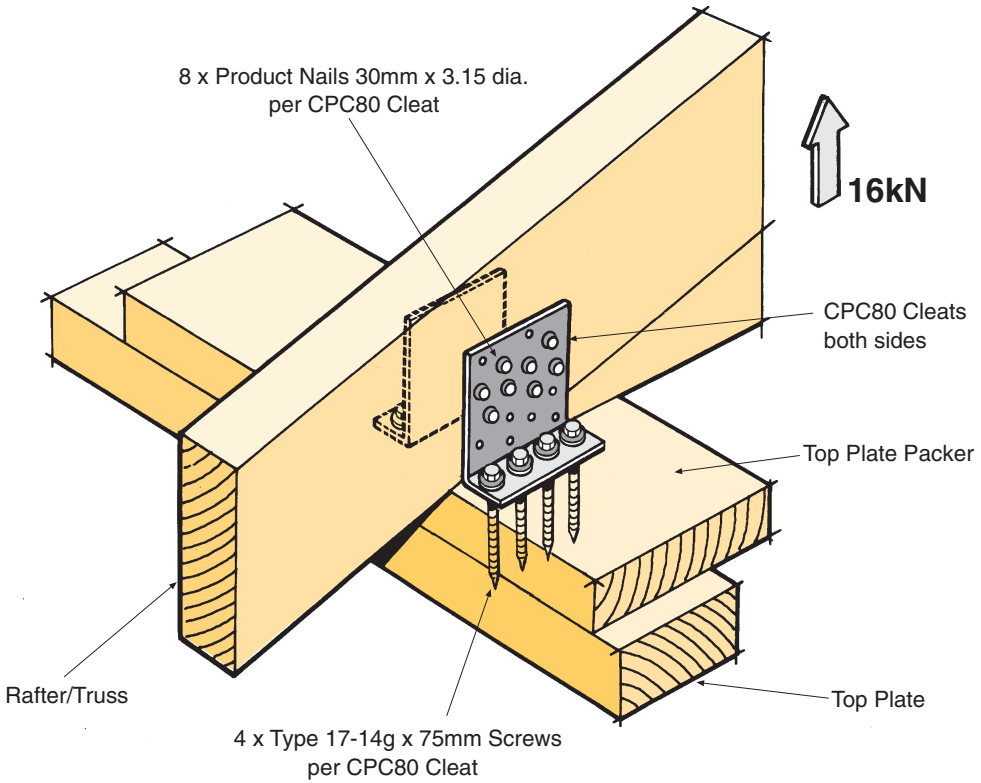
Available from leading Builders Supply Merchants throughout New Zealand

LUMBERLOK®

LUMBERLOK®

16kN TRUSS TO TOP PLATE FIXING

★ Complies with Table 10.13 NZS 3604:1999
★ Top mounted fixing allows additional face fixing if required



Code: 16kNTTP
Material: CPC80 1.55 G300 Z275 Galvanised Steel
Pack Includes: 2 x CPC80 Cleats
16 x Product Nails 30mm x 3.15 dia. Galvanised
8 x Type 17-14g x 75mm Hex Head Galvanised Screws

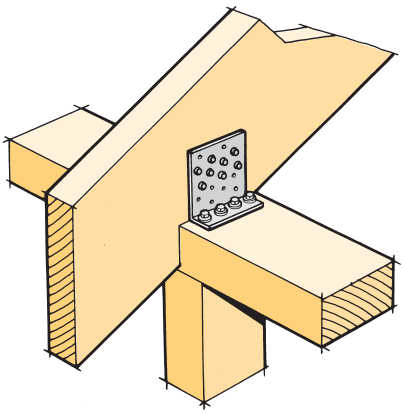
Available from leading Builders Supply Merchants throughout New Zealand

LUMBERLOK®

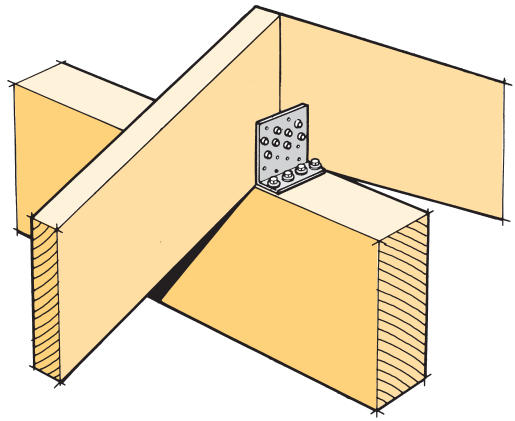
CONCEALED PURLIN CLEATS
FOR FIXING PURLINS TO EXPOSED RAFTERS

- ★ Quick and Easy to Apply
- ★ Resists High Wind Uplift

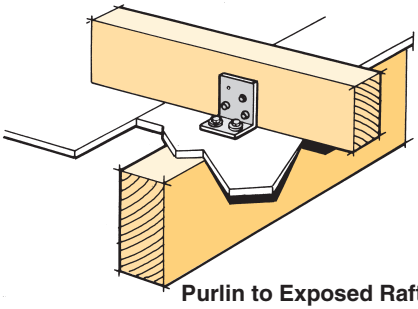
NOT TO BE USED IN EXTERIOR SITUATIONS



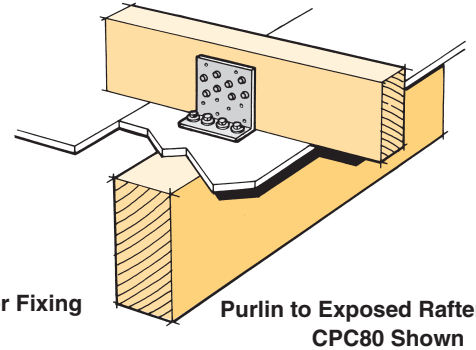
Exposed Rafter to Wall Fixing



Exposed Rafter to Ridge Beam Fixing

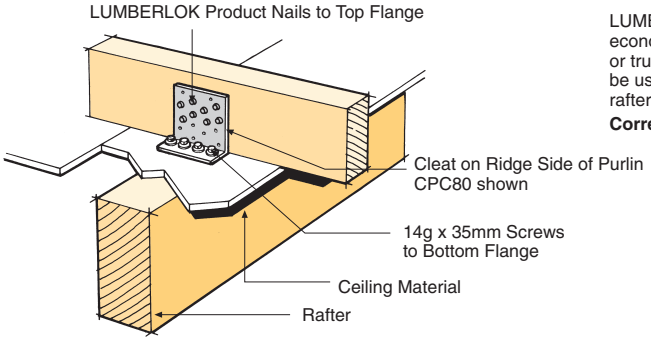


Purlin to Exposed Rafter Fixing
CPC40S Shown



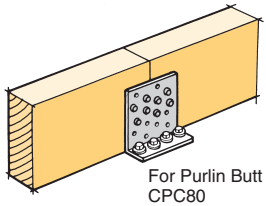
Purlin to Exposed Rafter Fixing
CPC80 Shown

Available from leading Builders Supply Merchants throughout New Zealand



LUMBERLOK Concealed Purlin Cleats provide an economical fixing for purlins to exposed rafters or trusses, to resist wind uplift. They can also be used in exposed to view situations, such as a rafter to ridge beam or top plate situation.

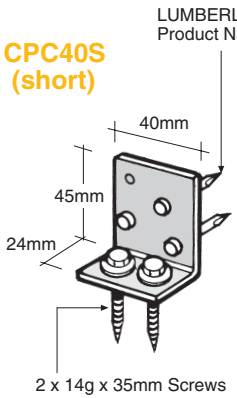
Correct nailing is most important. See below.



For Purlin Butt Joint, CPC80

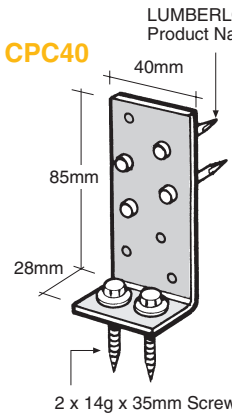
DIMENSIONS AND NAILING

CPC40S (short)



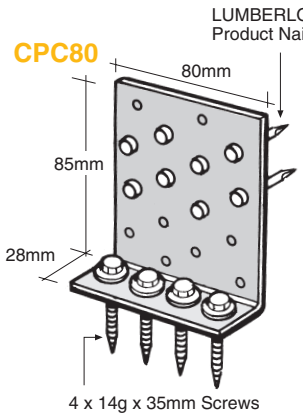
Rafter Width (nominal) 50mm

CPC40



50mm

CPC80



100mm

Uplift Direction	CPC40S	CPC40	CPC80
Characteristic Load	5 kN/pair	9 kN/pair	16 kN/pair

Nail as shown with LUMBERLOK Product Nails
- 30mm x 3.15 dia. Galvanised
- Type 17-14g x 35mm Hex Head Galvanised Screws

NAILS

To Top Flange: LUMBERLOK Product Nails 30mm x 3.15 dia.

Bottom Flange: Type 17-14g x 35mm Hex Head Galvanised Screws

STEEL

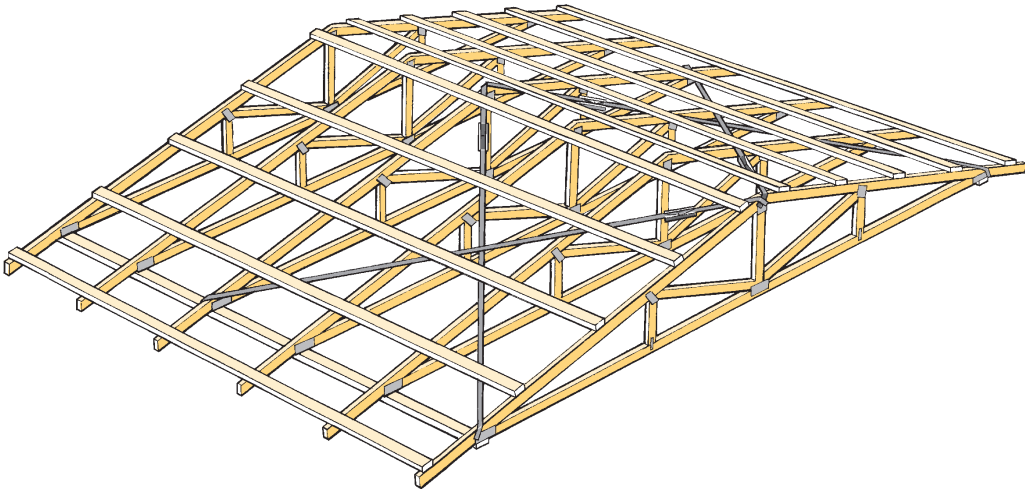
1.55 G300 Z275 Galvanised Steel
Nail Holes 3.8 diameter.
Screw Holes 7mm diameter.

SCREWS AND NAILS *NOT* INCLUDED WITH PRODUCT

LUMBERLOK®

ROOF BRACING SPECIFICATION

AS PER NZS 3604:1999



★ **Covers roof bracing requirements to resist horizontal loads as set out in NZS 3604:1999 Section 10.**

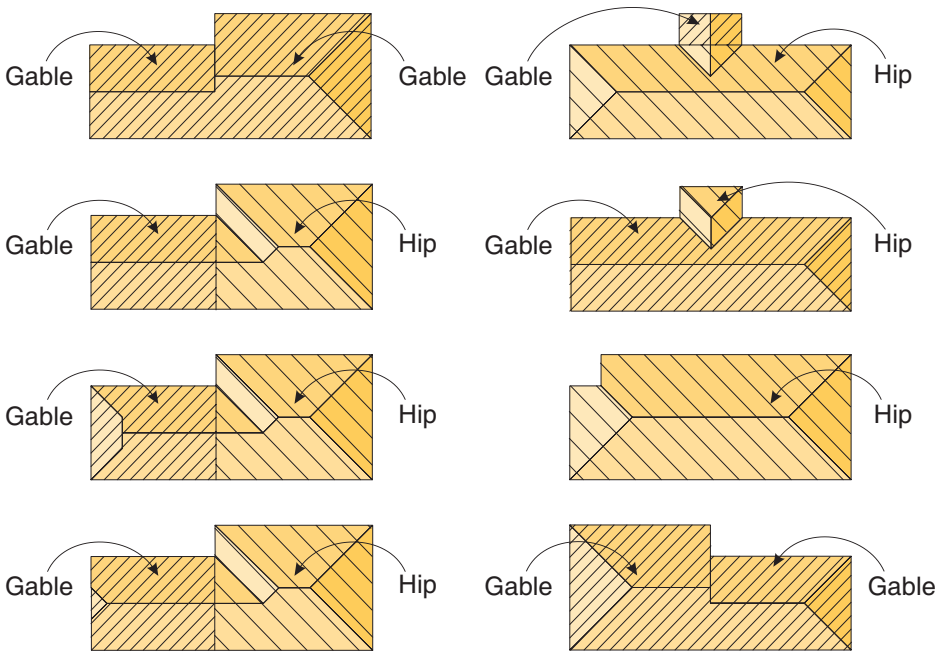
★ **A definitive guide to the description and installation of Roof and Ceiling Plane Braces as well as Roof Space Braces.**

Roof Bracing - Rules & Definitions

LUMBERLOK®

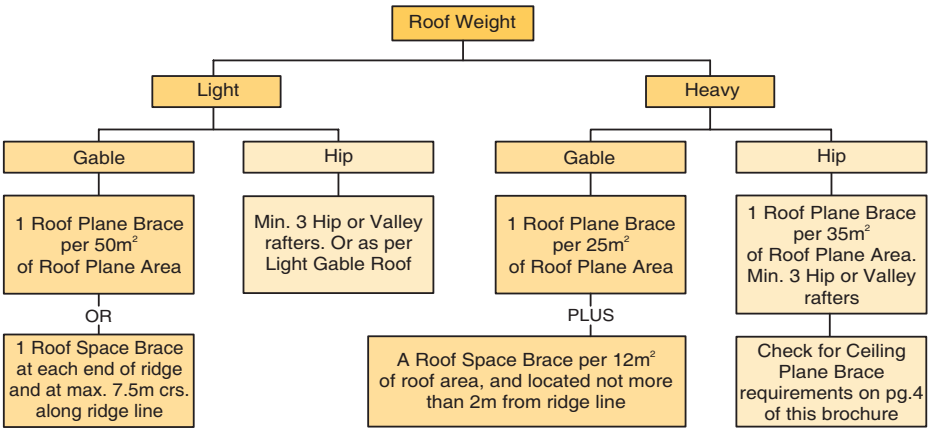
1. The bracing described in this brochure covers both framed roofs and fully trussed roofs.
2. Roof plane areas less than 6m^2 (e.g. dormers & porches) do not require bracing.
3. The definition of a hip roof is one having a sloping roof on part of all sides raking over the exterior walls (see examples below).
4. The definition of a gable roof is one having at least one vertical face above an exterior wall (see examples below).
5. Roof plane area is the actual area of the roof normal to the slope and can exclude the overhang section but not the verge overhangs.
6. A hip or valley rafter running clear from ridge to top plate can be classed as one roof plane brace.
7. A crossed row of LUMBERLOK Strip Brace (preferred for ease of installation) can be classed as one roof plane brace and shall be installed as detailed in this brochure.
8. A hip or valley rafter used as a roof plane brace can be considered to act in both directions of the respective roof planes that they cross.

Example Hip & Gable Roof Definitions

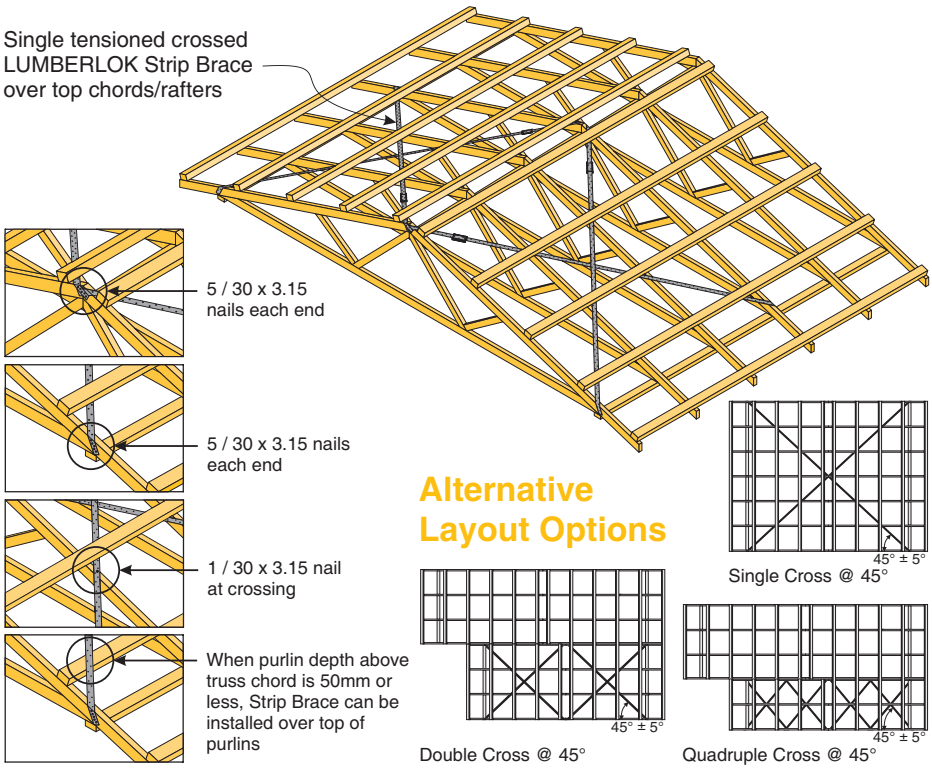


Roof Plane & Roof Space Brace Requirements Flow Chart

LUMBERLOK®



Roof Plane Brace & Installation



Alternative Layout Options

Single Cross @ 45°

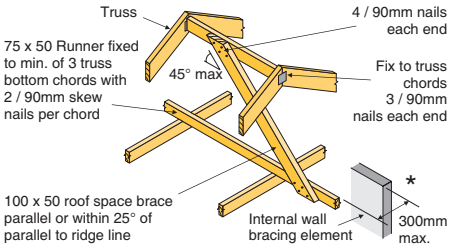
Double Cross @ 45°

Quadruple Cross @ 45°

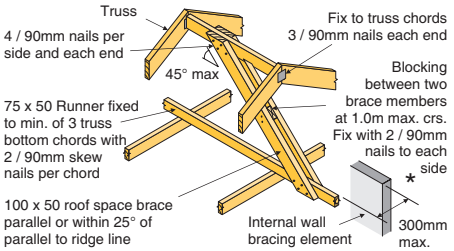
Roof Space Brace Installation

LUMBERLOK®

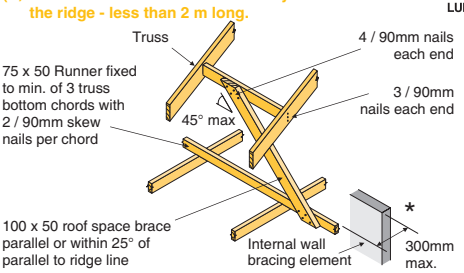
(A) ROOF SPACE BRACE - less than 2m long.



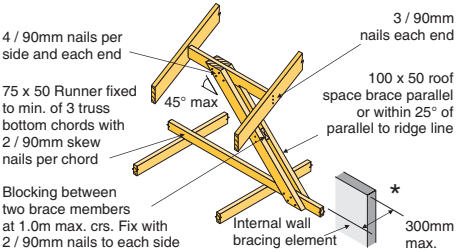
(B) ROOF SPACE BRACE - more than 2m long.



(C) ROOF SPACE BRACE - not directly under the ridge - less than 2 m long.



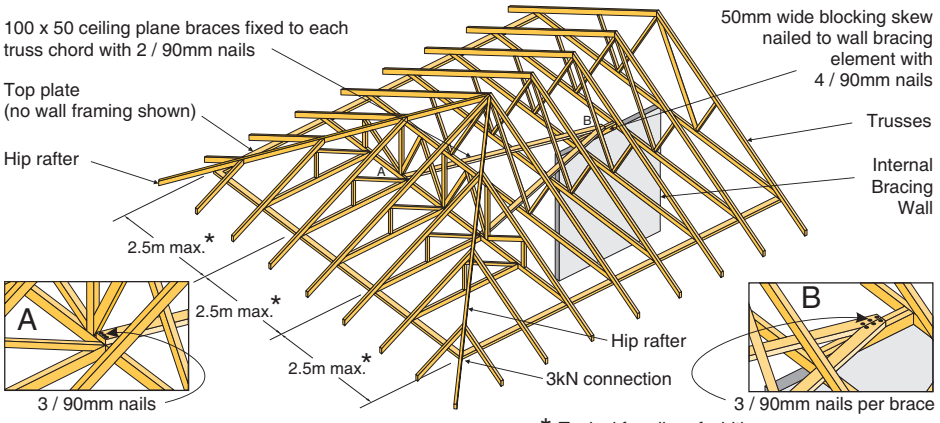
(D) ROOF SPACE BRACE - not directly under the ridge - more than 2 m long.



* Not required when a ceiling diaphragm complying with clause 13.5 of NZS 3604:1999 is used.

Ceiling Plane Brace Requirements

- Ceiling plane braces are required on HEAVY HIP roofs.
- Ceiling plane braces are fixed over top of ceiling joists or truss bottom chords, and are connected to wall bracing element parallel to them.
- Ceiling plane braces are not required where ceiling diaphragms complying with NZS 3604:1999, Clause 13.5 are used and the top plate is on the boundary of that diaphragm.
- Ceiling plane braces are not required on top plates where rafter trusses or jack trusses are installed at 1200mm crs.



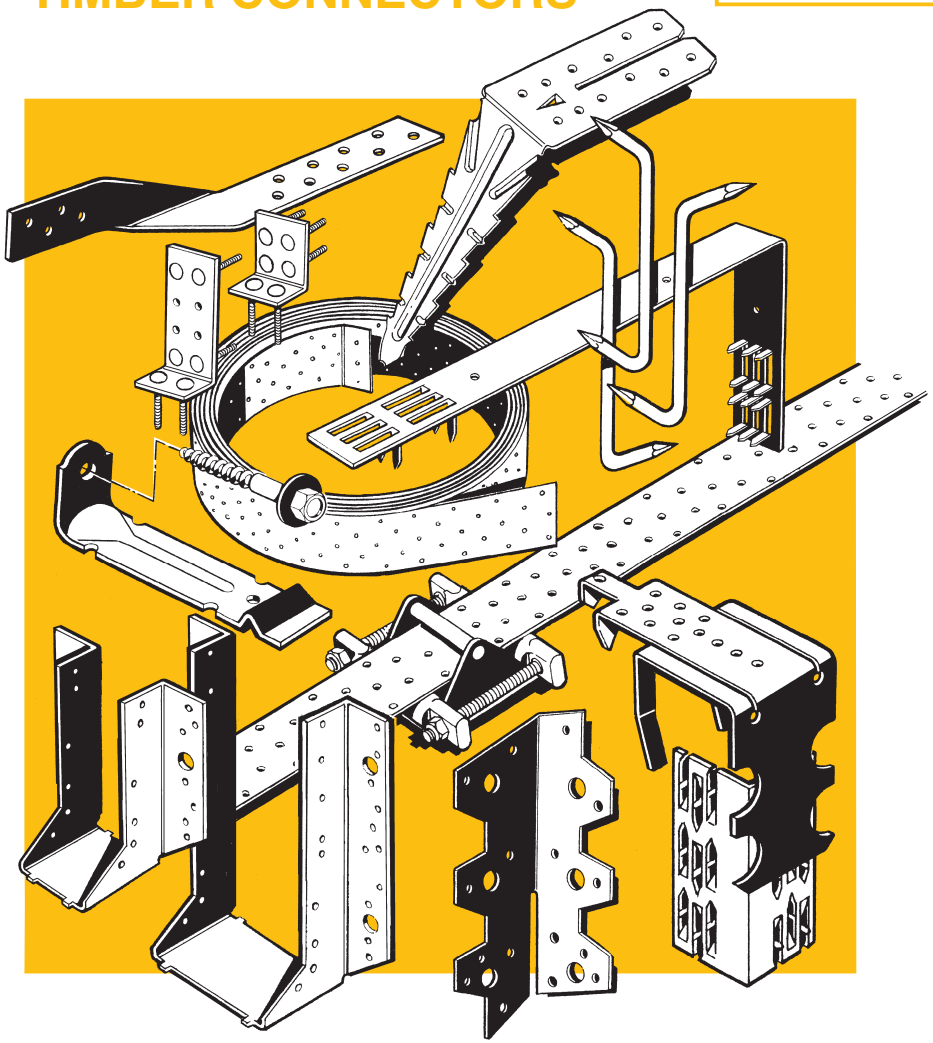
* Typical for all roof widths

20. INDUSTRY INFORMATION

LUMBERLOK®

TIMBER CONNECTORS

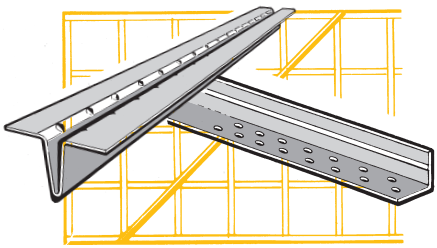
NOT TO BE USED IN EXTERIOR SITUATIONS
Stainless Steel alternatives are available where stated



Timber to Timber - Timber to Concrete - Timber to Steel

MiTek manufactures and markets the range of LUMBERLOK Timber Connectors for the building industry. Each product has been designed and developed to meet the needs and changes to building methods, and is tested to conform with the relevant NZ Standards. These include NZS 3603:1993 for timber design and NZS 3604:1999 Timber Framed Buildings. LUMBERLOK products are distributed nationwide, and are available from leading Builders Supply Merchants and Hardware outlets throughout New Zealand.

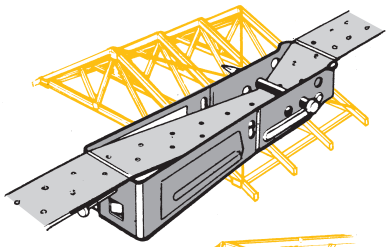
LUMBERLOK®



ANGLE BRACE & ‘T’ SECTION BRACE

Angle Brace may be used as either compression or tension brace. Nail holes are fully punched for ease of nailing. Minimum nail size 60mm x 3.15mm diameter. When used as a diagonal wall brace, it should be secured at each end with three nails, and two nails at each stud crossing.
Standard length is 3.6m, other sizes available on request (2.7m - 5.0m).
Angle brace can be used as an anti-sag mechanism for purlins or girts.
‘T’ Section Brace is an alternative to Angle Brace and requires a shallower cut into stud face. This profile usually eliminates the checking out of studs and is fixed as per Angle Brace.

Standard lengths available 3.0m - 4.5m.
Refer to Characteristic Loadings Brochure for design values.

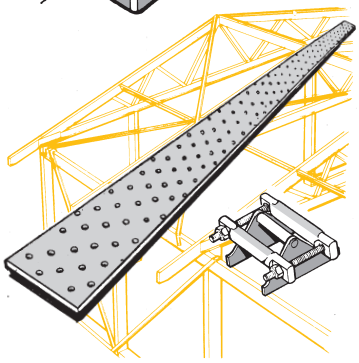


STRIP BRACE

0.6mm x 27mm G550 Z275
.91mm x 25mm G300 (Export only)

Strip Brace is supplied either in 30 or 10 metre coils for use as bracing or in short lengths as a jointing material.
Strip Brace provides an ideal bracing system for walls, or roof plane.
One crossed pair of strips may be used in each location where a diagonal brace is required. Fix using 5 x 30mm x 3.15mm diameter flat head nails at each end.
Tensioners are available separately if required.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304. (Stainless Steel tensioners not available)

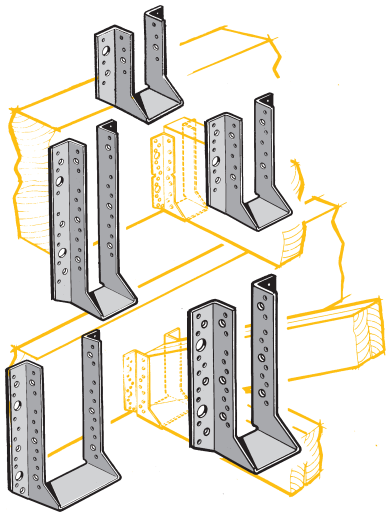


*MULTI-BRACE

.91mm x 53mm G300 Z275

This product has been developed for commercial building situations as an alternative to steel rod or timber as a bracing element. The 53mm wide x 1.0mm thick steel coils are available in lengths of 10m, 15m and 30m punched to allow the easy fixing, using 11 x 30mm x 3.15mm diameter flat head nails at each end.
Tensioners are available separately if required.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304. (Stainless Steel tensioners not available)



*JOIST HANGERS

.91mm G300 Z275

Joist hangers are designed for use where a strong, rigid joint is required between members meeting at 90˚, e.g. truss/joist to beam, or rafter to bearer connection.

i) **Joist Hanger 47 x 90**
Designed for use where gauged timber of 47mm width and up to 150mm deep.

ii) **Joist Hanger 47 x 120**
Multi-use bracket suitable for gauged 47mm thick timber up to 200mm deep.

iii) **Joist Hanger 47 x 190**
Used for gauged 47mm thick timber up to 300mm deep.

iv) **Joist Hanger 70 x 180**
A special size joist hanger designed for gauged 69mm wide timbers.

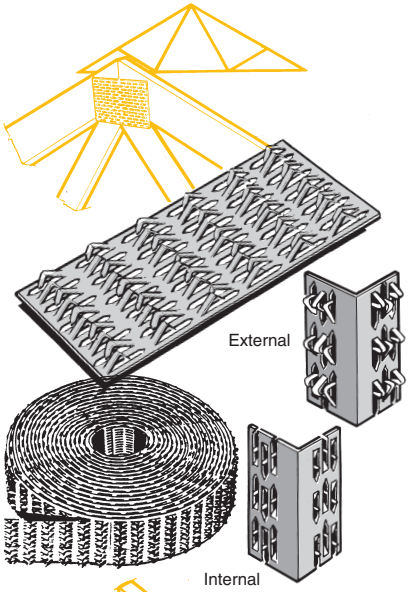
v) **Joist Hanger 95 x 165**
For use on gauged 94mm wide timber or double joists/trusses.

Note: Joist Hangers 52mm wide also available for rough sawn timber, and 37mm wide for 35mm kiln dried timber.

All of the above joist hanger connections should be fixed using 30mm x 3.15mm diameter LUMBERLOK Product Nails, or equivalent bracket nails. All joist hangers must be fully nailed to gain maximum strength.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304-2B.

*** Detailed product sheet available**



TYLOK PLATE

.95mm G300 Z275

Tylok plate is designed for on-site use and can readily be applied by hammer as well as hydraulic press. Tylok plates are suitable for a wide range of applications such as trusses, formwork, site splicing etc. Tylok plates are manufactured from galvanised steel in a range of sizes.

Refer to Loadings Brochure for design values. Plate code example – 6T10 = 6 rows of teeth long x 10 teeth wide.

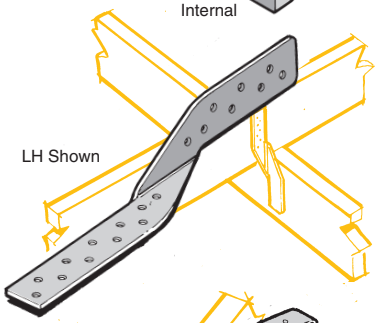
Code	Width	Length
2T5	34mm	60mm
4T5	34mm	120mm
6T5	34mm	180mm
8T5	34mm	240mm
10T5	34mm	300mm
12T5	34mm	360mm
14T5	34mm	420mm
16T5	34mm	480mm
Coil T5	34mm	15m

Code	Width	Length
2T10	68mm	60mm
4T10	68mm	120mm
6T10	68mm	180mm
8T10	68mm	240mm
10T10	68mm	300mm
12T10	68mm	360mm
14T10	68mm	420mm
16T10	68mm	480mm
Coil T10	68mm	15m

Code	Width	Length
4T15	102mm	120mm
6T15	102mm	180mm
8T15	102mm	240mm
10T15	102mm	300mm
12T15	102mm	360mm
Coil T15	102mm	15m

Code	Width	Length
6T20	136mm	180mm
8T20	136mm	240mm
10T20	136mm	300mm
12T20	136mm	360mm
14T20	136mm	420mm
Coil T20	136mm	15m

Tylok Plate is also available in coil form, in all four widths, as a convenient method of various applications by the builder on site. By using metal cutters, any length plate can be cut off the 15m coils as required.



TYLOK ANGLE

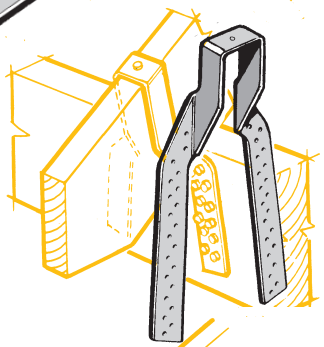
2A6 35mm x 35mm x 60mm
3A6 35mm x 35mm x 90mm
5A6 35mm x 35mm x 150mm
6A6 35mm x 35mm x 180mm

CEILING TIE CT160 & CT200 (LH or RH)

.91mm x 27mm G300 Z275

Overall length 160mm and 200mm – A very useful connector primarily for fixing ceiling joists to rafter or truss members. It also provides an excellent truss or rafter to top plate connection. Minimum nail size 30mm x 3.15mm diameter.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304-2B.



CYCLONE TIES CT400 & CT600

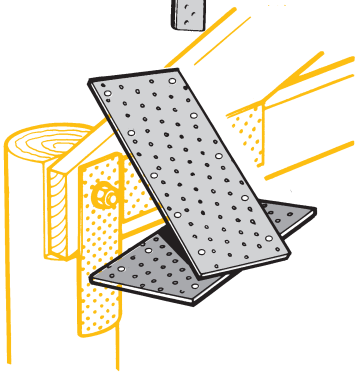
.91mm x 27mm G300 Z275

Overall length 400 and 600mm – Designed specifically for fixing down rafters or purlins in high wind situations. These are produced in straight lengths which are bent over timber members on site, therefore accommodating various width purlins or rafters.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304.

*NAILON PLATE

.91mm G300 Z275
1.55mm G300 Z275
3.0mm Black Steel NZCC - SD ungalvanised



LUMBERLOK Nailon is produced as a flat steel plate with prepunched holes to accommodate 3.15mm diameter nails. Plate sizes vary in thickness, width and length. Standard products are manufactured using Nailon, as well as a range of special products. Use of Nailon plate fixings is far quicker and more economic than alternate methods.

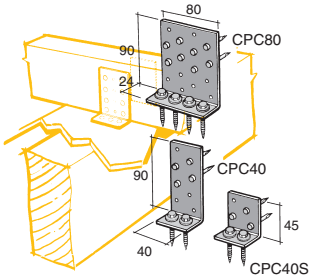
Nailon Plate - Available as a flat plate, cut to required length

Refer to Characteristic Loadings Brochure for design values.

Plate thickness	1.0mm	2.0mm	3.0mm
Width	110mm	113mm	130 or 240mm

Nailon provides a very strong site joint for truss splicing, rafter connections, etc. 3.0mm can also be welded to form timber to steel or concrete connections.
1.0mm Nailon Plate available in Stainless Steel 304-2B

*** Detailed product sheet available**



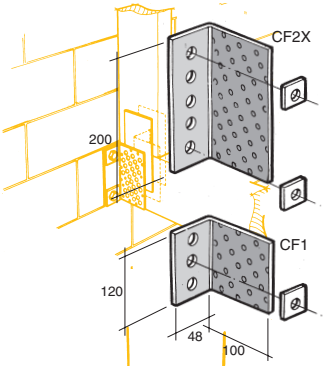
*CONCEALED PURLIN CLEAT CPC40, CPC80, CPC40S

1.55mm G300 Z275

Normal Rafter Width	50	100
Cleat	CPC40 or CPC40S	CPC80

CPC Cleats provide an excellent purlin/rafter fixing in exposed situations, resisting any wind uplift with anti withdrawal screws.
The cleats can also be used for exposed rafter to ridge beam connections.
Screws and nails are not supplied with product.

Refer to Characteristic Loadings Brochure for design values.

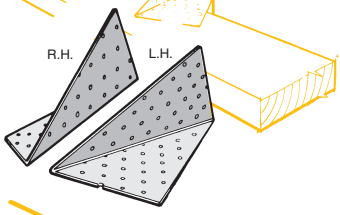


CONCRETE FIXING CLEAT CF1 & CF2X

1.55mm G300 Z275

Both cleats provide a quick and economical method of joining timber trusses, beams, columns to solid concrete or grouted concrete blockwork.
Both cleats can be used on one or two sides of timber members, depending on the loads required.

Refer to Characteristic Loadings Brochure for design values.

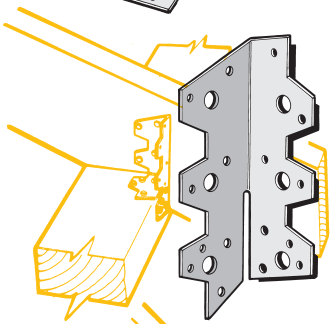


DIAGONAL CLEAT N21 (LH or RH)

.91mm G300 Z275

This diagonally folded Nailon plate 240mm long, provides a solution for fixing and aligning girts to timber poles.
Can also be used for fixing purlins to rafters in high wind uplift situations, or to provide a strong 90˚ butt joint for large timber sizes.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304-2B

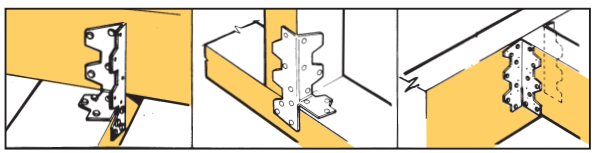


MULTIGRIP

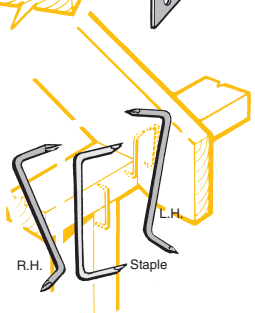
.91mm G300 Z275

LUMBERLOK Multigrips are a multipurpose product that can be bent into any of five combinations. One product provides for all alternatives with the bending slot enabling easy on-site bending.

Size 125mm high x 38mm flange. Fix with LUMBERLOK Product Nails 30mm x 3.15mm diameter.
Correct nailing shown below.
Refer to Characteristic Loadings Brochure for design values.



Available in Stainless Steel 304-2B.

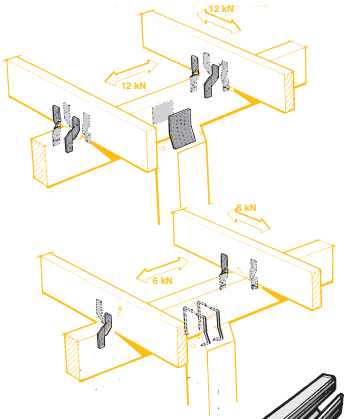


WIRE DOGS

Wire Dogs are manufactured as left handed, right handed, and staples, from 4.9mm diameter galvanised wire.
Each has a 95mm shank, and a 35mm leg.
Wire Dog/Staples have been proven by test to be the strongest and most economical timber fastener of its type on the New Zealand market.
Typical use in a wind uplift situation, such as truss or rafter to top plate, and top plate to stud connection.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304-2B.

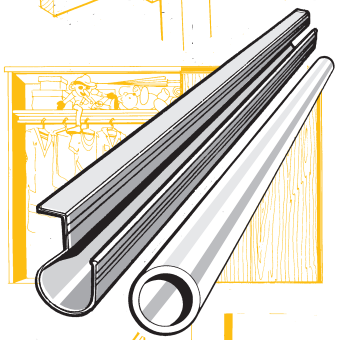
* Detailed product sheet available



*12kN & 6kN PILE FIXING

Both these products comply with NZS 3604:1999 as a fixing method for timber piles to bearers to joists. The 12kN product pack is suitable for both Anchor and Brace pile situations whilst the 6kN pack is used with cantilever piles.
Each product is manufactured in a hot dip galvanised or stainless steel option to suit the corrosive environment intended to be used on, and all packs are supplied inclusive of all necessary nails.

Refer to brochure for application data.

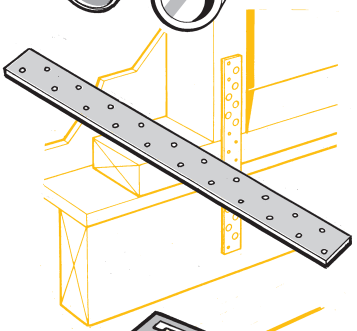


CLOSET RAIL

This attractive product provides an alternative to bar or timber rails in wardrobe situations. Manufactured from extruded aluminium, the closet rail enhances wardrobe appearances and also provides additional support strength to the closet shelf. The product is available in lengths of 1.8m, 2.4m and 3.6m, either standard mill finish or powder coated white.

CLOSET TUBE

This economical and attractive product is ideal as an alternative to galvanised pipe in wardrobe situations. Closet Tube is available in lengths of 1.8m or 2.4m, and powder coated finished in white. Strong sockets are also available to support the Closet Tube ends.

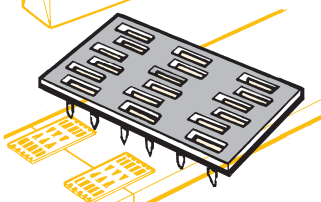


*SHEET BRACE STRAP

.91mm x 25mm G300 Z275 Galvanised Steel

Punched strap available in lengths of 200mm, 300mm, 400mm and 600mm, to provide a hold down for use with sheet bracing. As per NZS 3604:1999, a 6kN capacity can be obtained by one strap (6 nails per strap end) or 12kN per two straps (6 nails per strap end).

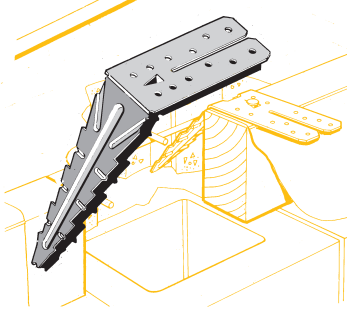
Refer to brochure for application data.
Available in Stainless Steel 304-2B.



STRAP NAIL

Is specifically designed for on-site use and many general applications where a strong, rigid load carrying joint is required. Strap Nails eliminate skew-nailing, scarf cutting and checking in.
The Strap Nail has many applications in the furniture and packaging industries, plus having many uses for the home-handyman.

Refer to Characteristic Loading Brochure for design values.

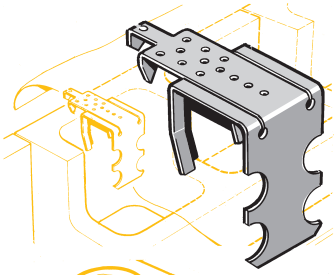


*BOTTOM PLATE FIXING ANCHOR

Ingenious product designed to fix timber wall frames down onto concrete slab floors. Bottom Plate Anchors are temporarily fixed to the perimeter boxing at 900mm centres max. prior to the concrete pour, and folded around the bottom plate when the frames are located. Nails are then applied to secure the frames in position.
Alternative to concrete bolts, or the drilling of bottom plates and lifting of frame over steel rods previously located in floor slab.

Refer to brochure for application data.
Available in Stainless Steel 304.

* **Detailed product sheet available**

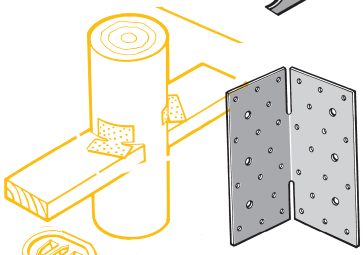


*HEADER BLOCK ANCHOR

LUMBERLOK®

This product has been developed to complement the Bottom Plate Anchor, where concrete header blocks are used to form the concrete slab perimeter. The product is clipped onto the block edge at 900mm centres max. and left until the slab is poured and frames ready to stand up.
The tongue is then lifted up off the surface and folded around the bottom plate for nailing.

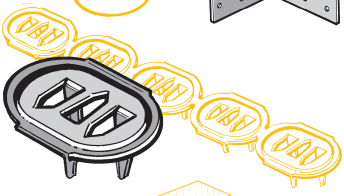
Refer to brochure for application data.
Available in Stainless Steel 304.



GIRTPLATE

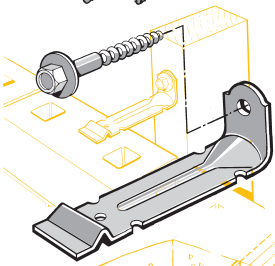
Specifically designed for girt to pole fixing, as per Farm Building Designs. 120mm long Nailon Plate, slit and pre-folded to 90 deg. Fixed with min. 8 x 30mm x 3.15mm diameter LUMBERLOK Product Nails each face (16/cleat).

Available in Stainless Steel 304-2B.



LITTLE GRIPPER

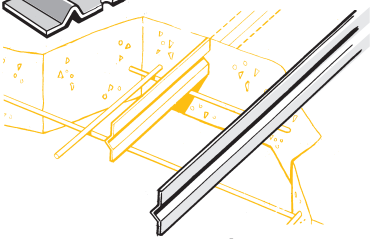
Availabe in strips of 5, this hammer on-snap off connector is suitable for economical quick fastening of building paper, shade cloth, plastic sheeting etc.



*SCREW TIE

Meets NZS 3604:1999 and AS/NZS 2699.1:2000. This product is used to tie brick veneer to timber framework using a 35mm long type 17 galvanised screw.
The actual 'Tie' is available in 85mm and 105mm lengths to suit various cavity sizes and brick widths.
Suitable for all timber including dry stress graded 90mm x 35mm studs.

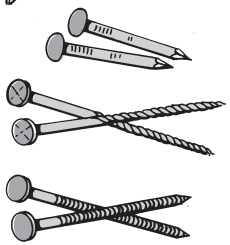
Refer to brochure for application data.
Available in Stainless Steel 316.



*KRACK MATE

A Preformed Metal Crack Inducer for all types of Concrete Surfaces. Eliminates Concrete Cutting.

Refer to brochure for application data.



PRODUCT NAILS

30mm x 3.15 diameter flat head.
Available in 25kg, 5kg packs and 500g bags. To be used for most products requiring nailing. Also available in Stainless Steel.

SPIRAL ROLLED NAILS

90mm x 3.55 diameter FH, 45mm x 3.55 diameter FH.
Available in 1kg packs.

ANNULAR GROOVED NAILS

45mm x 3.3 diameter FH, 90mm x 4.0 diameter FH.
Stainless Steel in 1kg packs.

MiTek New Zealand Ltd.

Correspondence from: **AUCKLAND**
40 Neales Road, East Tamaki 2013
PO Box 58-014, Greenmount 2141
Phone: 09-274 7109
Fax: 09-274 7100

CHRISTCHURCH
14 Pilkington Way, Wigram 8042
PO Box 8387, Riccarton 8440
Phone: 03-348 8691
Fax: 03-348 0314

www.miteknz.co.nz

HOME OF **GANG-NAIL®** BUILDING SYSTEMS

February 2001

PRODUCER STATEMENT

FOR

LUMBERLOK® TIMBER CONNECTORS

This document is issued by MiTek New Zealand Ltd. for the purpose of informing users of **LUMBERLOK** Connectors as to the appropriate conditions under which they are to be used and their durability, as required by the New Zealand Building Code, Clause B2, Durability.

1. PRODUCT DESCRIPTION

The **LUMBERLOK** Connector is a metal plate connector manufactured from pre-galvanised steel (Z275) coil or wire. A selection of **LUMBERLOK** products are also available in stainless steel Grade 304-2B.

2. PRODUCT USE

LUMBERLOK Connectors are designed and manufactured for use in connecting timber to timber, timber to steel, and timber to concrete, and as braces and supports for various types of timber construction.

LUMBERLOK Connectors should be used only for the purpose for which each of them is designed and manufactured and in accordance with technical information supplied. In the case of doubt as to use, MiTek New Zealand Ltd. should be contacted for guidance.

3. HANDLING, STORAGE, AND INSTALLATION

Pending use, **LUMBERLOK** Connectors should be stored in a weatherproof environment, protected from weather and moisture, remain in original packaging and be handled in such a manner as to avoid damage to the galvanised surface.

Structures incorporating **LUMBERLOK** Connectors should also be handled and installed in such a manner as to avoid stress or damage to the connector.

4. DURABILITY

This Producer Statement is to be read in conjunction with the MiTek New Zealand Ltd. 'Alternative Solution for Table 4.1 NZS 3604:1999'.

When used, handled, stored and installed in accordance with the above conditions **LUMBERLOK** Connectors meet the NZBC 1992 clause requirement for 50 years life expectancy.

5. GENERAL

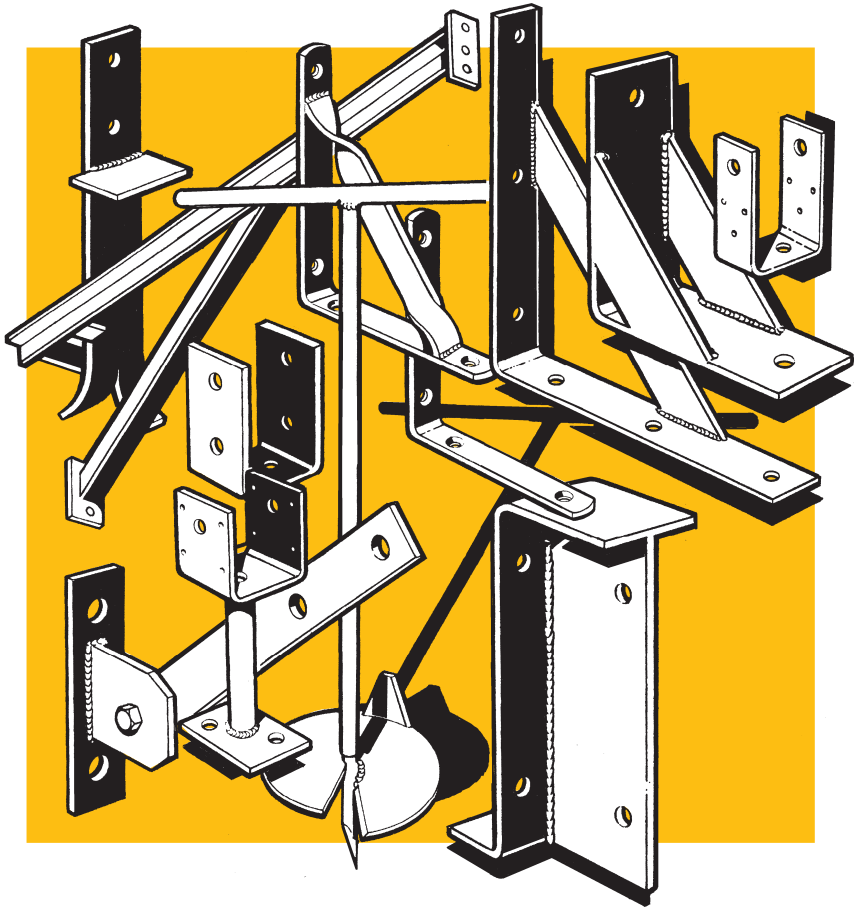
This statement is limited to the use of **LUMBERLOK** Connectors in New Zealand. No statement, representation or warranty is made or given in relation to any other country.

LUMBERLOK makes and gives no statement, representation, or warranty except as expressly set out in this statement and all conditions, statements, representations, or warranties implied by law or trade custom are excluded.

BOWMAC®

STRUCTURAL BRACKETS CATALOGUE

SUPERIOR QUALITY, HOT DIP GALVANISED, HEAVY DUTY BRACKETS FOR FIXING TIMBER TO TIMBER, TIMBER TO CONCRETE, TIMBER TO STEEL



The BOWMAC product range is designed to cut building costs. The extensive range of brackets suits all types of timber construction, and provides the designer and builder with a versatile, economic and very extensive joining system.

BOWMAC Brackets are available from leading builders supply merchants throughout New Zealand.

DESCRIPTION

The BOWMAC product range of fixing brackets, supports and braces are specifically designed for use in all types of timber construction. All products utilise high grade steel and rigorous quality control ensures a quality product.

STANDARDS

Applicable timber standards are NZS 3603 and NZS 3604.

GALVANISING

All components are hot dip galvanised after manufacture to achieve an average of 900gm/m^2.

DESIGN LOADING

These can be derived from the allowable bolt loads in timber, using the relevant design code. Recommended loadings for pole to brace cleats B128, B145 & B155 only are shown here. Refer to separate brochure for loadings data.

STANDARD PRODUCT RANGE

This catalogue details the standard range of BOWMAC products. Refer to separate brochure for Stainless Steel 304 - 2B product.

SPECIAL PRODUCTS

BOWMAC also manufactures custom made products to suit specific requirements. A lead time by discussion is required to allow for manufacture.

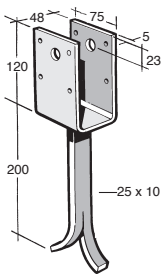
AVAILABILITY

The BOWMAC product range is available from leading builders supply merchants throughout New Zealand.

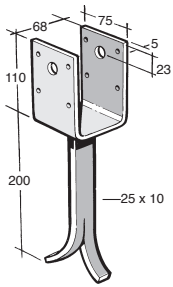
END USE

The purchaser is responsible for checking the suitability of any component for it's intended use.

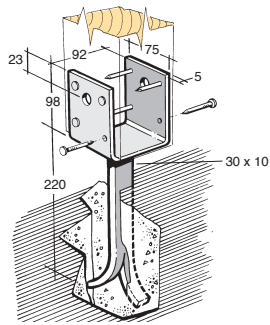
POST AND BEARER BRACKETS



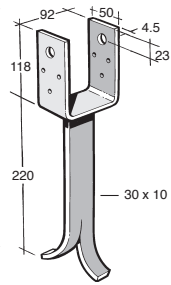
B132
(Nails Included Only)



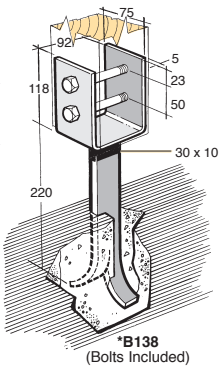
B133
(Nails Included Only)



B134
(Nails Included Only)

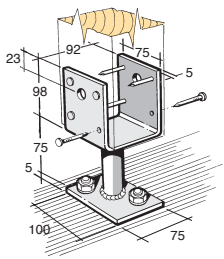


***B135**
(Nails & Bolt Included)

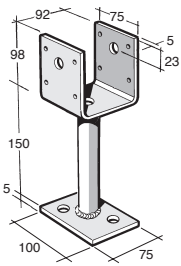


***B138**
(Bolts Included)

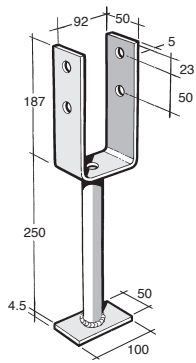
* Similar also available in stainless steel 304-2B Refer to brochure



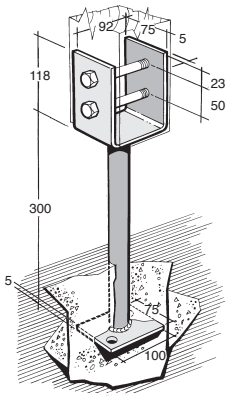
B12
(Nails Included Only)



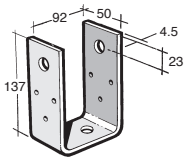
B14
(Nails Included Only)



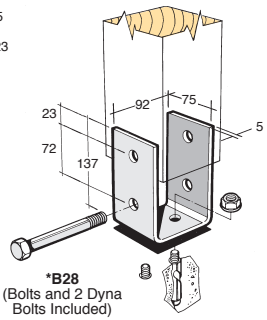
B16 (High Wind)
(Bolts Not Included)



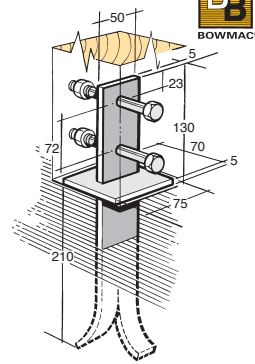
B18
(Bolts Included)



***B25**
(Nail, Bolt and 2 Dyna Bolts Included)



***B28**
(Bolts and 2 Dyna Bolts Included)



B195

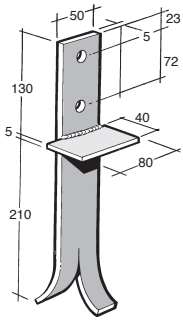
BOLT & NAIL SIZES

FIXING NOTE

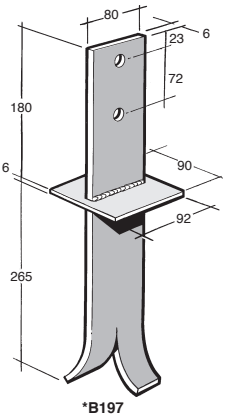
All bolt holes accommodate M12 Bolts unless noted.
Nail holes to accommodate 40mm x 3.15Ø F. Head square twisted shank nails.
Hot dip galvanised.

BOLTS NOT INCLUDED UNLESS NOTED

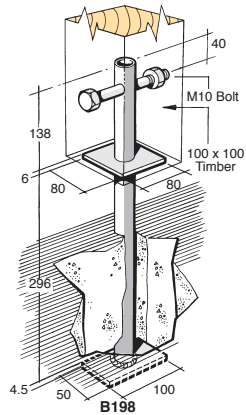
* Similar also available in stainless steel 304-2B Refer to brochure



B196

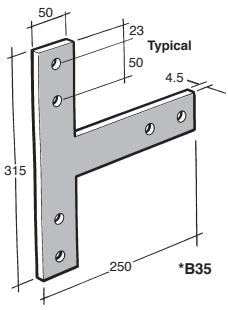


***B197**

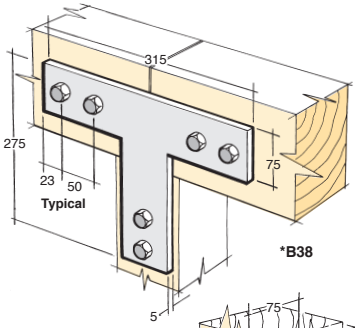


B198

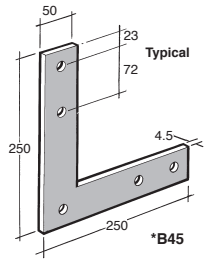
STRAPS



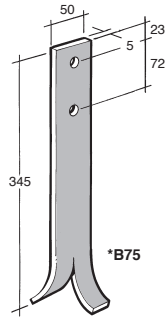
***B35**



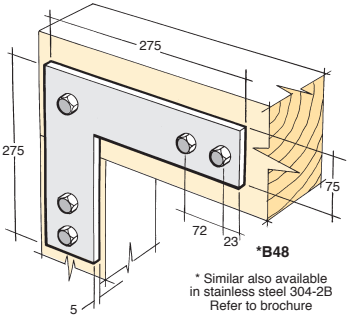
***B38**



***B45**

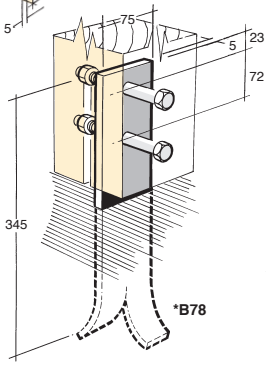


***B75**

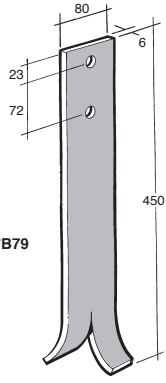


***B48**

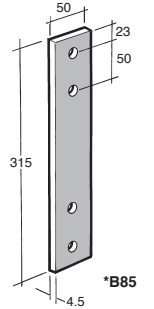
* Similar also available in stainless steel 304-2B Refer to brochure



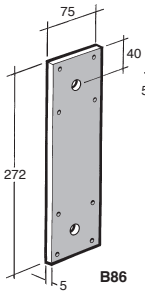
***B78**

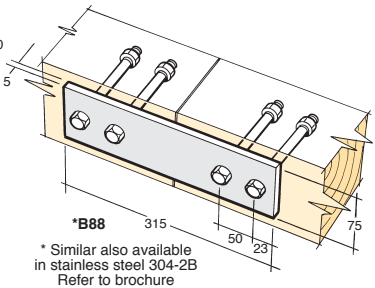


***B79**

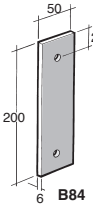


***B85**





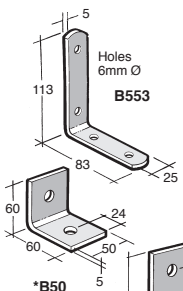
* Similar also available in stainless steel 304-2B Refer to brochure

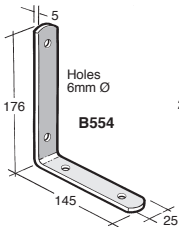


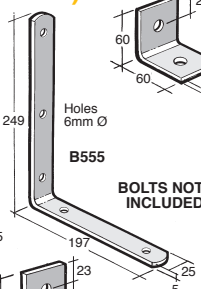
BOLT & NAIL SIZES

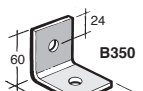
All bolt holes to accommodate M12 Bolts unless noted.
Nail holes to accommodate 40mm x 3.15Ø F. Head square twisted shank nails.
Hot dip galvanised.

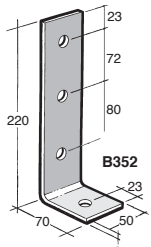
ANGLE BRACKETS (No Gusset)

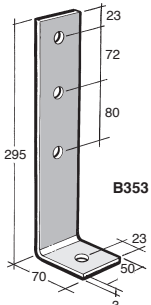


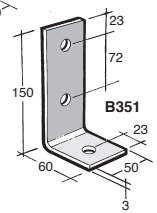


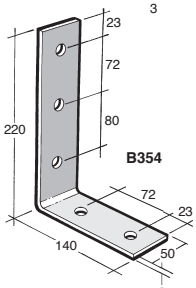


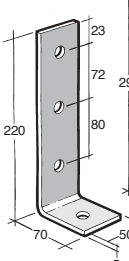


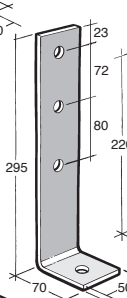


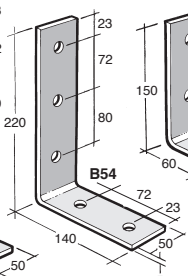


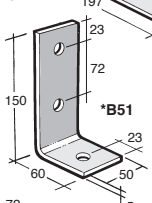


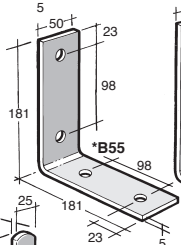


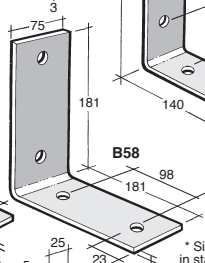






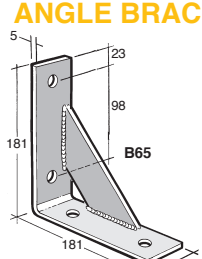


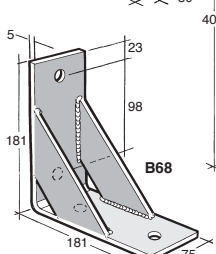


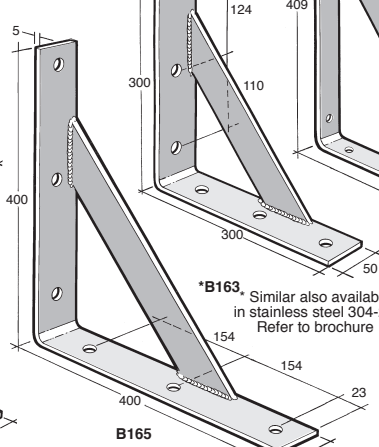


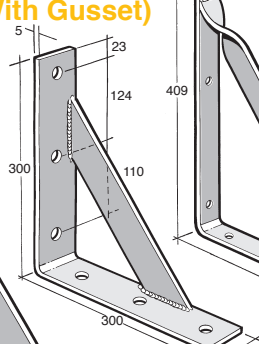
* Similar also available in stainless steel 304-2B Refer to brochure

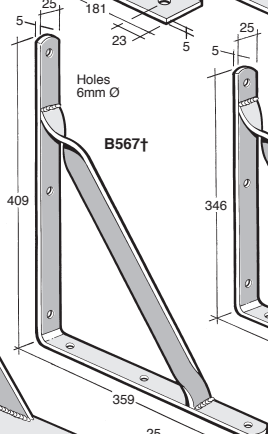
ANGLE BRACKETS (With Gusset)

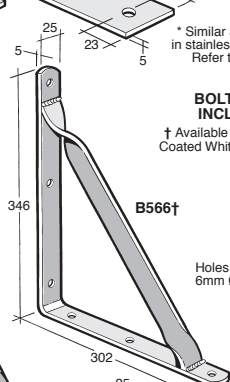






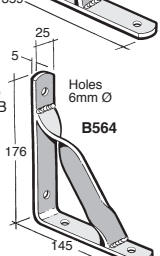


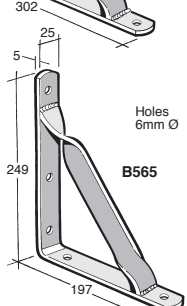




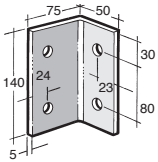
BOLTS NOT INCLUDED

† Available in Powder Coated White or Brown

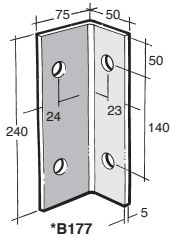




ANGLES

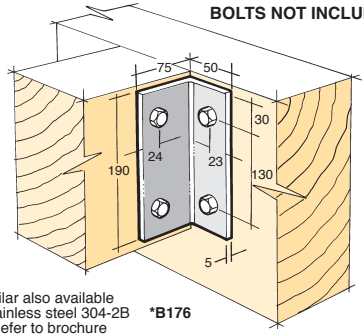


*B175



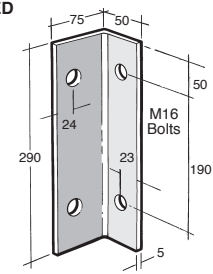
*B177

BOLTS NOT INCLUDED



*Similar also available in stainless steel 304-2B Refer to brochure

*B176



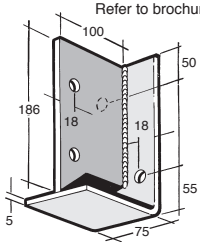
B178

BOLT SIZES

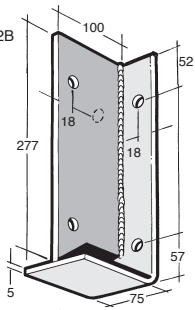
All bolt holes to accommodate M12 Bolts unless noted.

Z & L BEAM SUPPORTS

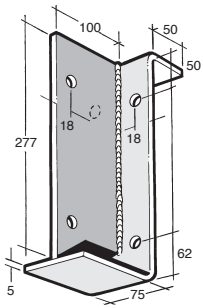
*Similar also available in stainless steel 304-2B Refer to brochure



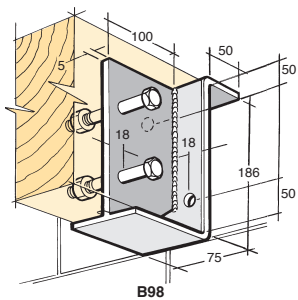
*B108



*B109



B99

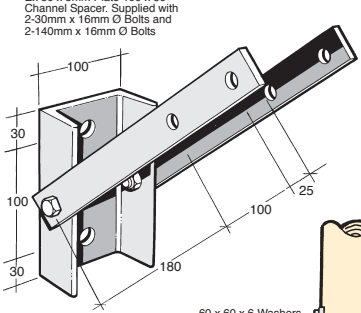


B98

BOLTS NOT INCLUDED

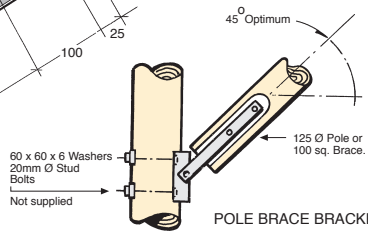
*B155 POLE BRACE BRACKET

Ex 50 x 5mm Plate 100 x 50 Channel Spacer. Supplied with 2-30mm x 16mm Ø Bolts and 2-140mm x 16mm Ø Bolts



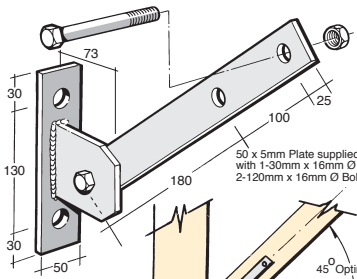
42kN CHARACTERISTIC LOAD TENSION AND COMPRESSION

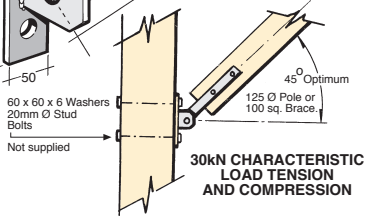
*Similar also available in stainless steel 304-2B Refer to brochure



POLE BRACE BRACKET

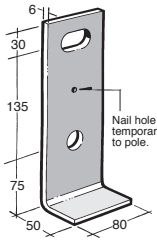
*B145 POLE BRACE BRACKET

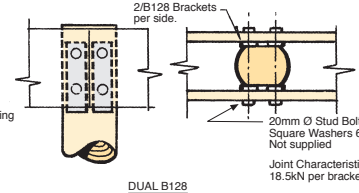




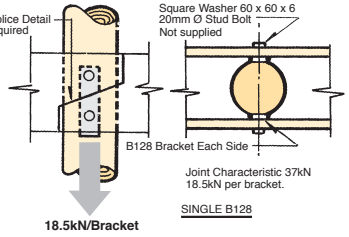
30kN CHARACTERISTIC LOAD TENSION AND COMPRESSION

B128 POLE BEAM BRACKET





DUAL B128

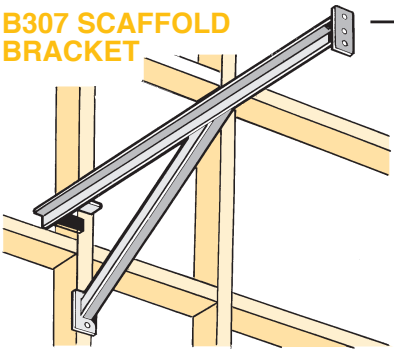


SINGLE B128

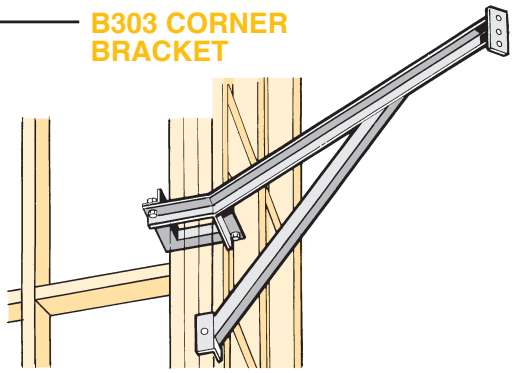
POLE CONSTRUCTION DETAILS
(BOLTS & WASHERS NOT INCLUDED)

BOWMAC®

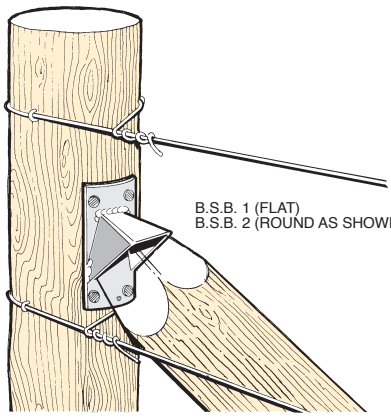
B307 SCAFFOLD BRACKET



B303 CORNER BRACKET

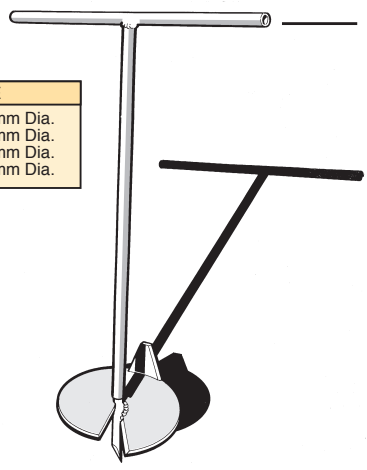


FENCE STAY BRACKET



BONZER BORER

MODEL	SIZE
BB100	100mm Dia.
BB150	150mm Dia.
BB200	200mm Dia.
BB250	250mm Dia.



MiTek New Zealand Ltd.

Correspondence from: **AUCKLAND**
40 Neales Road, East Tamaki 2013
PO Box 58-014, Greenmount 2141
Phone: 09-274 7109
Fax: 09-274 7100

CHRISTCHURCH
14 Pilkington Way, Wigram 8042
PO Box 8387, Riccarton 8440
Phone: 03-348 8691
Fax: 03-348 0314

www.miteknz.co.nz

HOME OF **GANG-NAIL®** BUILDING SYSTEMS

February 2001

PRODUCER STATEMENT

FOR

BOWMAC® STRUCTURAL BRACKETS

This document is issued by MiTek New Zealand Ltd. for the purpose of informing users of **BOWMAC** Structural Brackets as to the appropriate conditions under which they are to be used and their durability, as required by the New Zealand Building Code, Clause B2, Durability.

1. PRODUCT DESCRIPTION

BOWMAC Structural Brackets are fixing brackets, supports, and braces manufactured from steel hot dip galvanised after manufacture. A selection of **BOWMAC** Structural Brackets is also available in stainless steel, Grade 304-2B.

2. PRODUCT USE

BOWMAC Structural Brackets are designed and manufactured for use in connecting timber to timber, timber to concrete, and timber to steel, and to provide structural support to timber constructions.

BOWMAC Structural Brackets should be used only for the purpose for which each of them is designed and manufactured and in accordance with technical information supplied. In the case of doubt as to use, MiTek New Zealand Ltd. should be contacted for guidance.

3. HANDLING, STORAGE AND INSTALLATION

Pending use, **BOWMAC** Structural Brackets should be stored in a weatherproof environment, protected from weather and moisture, remain in original packaging and be handled in such a manner as to avoid damage to the galvanised surface.

Structures incorporating **BOWMAC** Structural Brackets should also be handled and installed in such a manner as to avoid stress or damage to the galvanised surface.

4. DURABILITY

This Producer Statement is to be read in conjunction with the MiTek New Zealand Ltd. 'Alternative Solution for Table 4.1 NZS 3604:1999'.

When used, handled, stored and installed in accordance with the above conditions **BOWMAC** Structural Brackets meet the NZBC 1992 clause requirement for 50 years life expectancy.

5. GENERAL

This statement is limited to the use of **BOWMAC** Structural Brackets in New Zealand. No statement, representation or warranty is made or given in relation to any other country.

BOWMAC makes and gives no statement, representation, or warranty except as expressly set out in this statement and all conditions, statements, representations, or warranties implied by law or trade custom are excluded.

MiTek New Zealand Ltd.

AUCKLAND
PO Box 58-014, Greenmount
Phone (09) 274 7109
Fax (09) 274 7100

CHRISTCHURCH
PO Box 8387, Riccarton
Phone (03) 348 8691
Fax (03) 348 0314

www.miteknz.co.nz

HOME OF **GANG-NAIL®** BUILDING SYSTEMS