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
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2. GENERAL

• Timber Strength Properties
# TIMBER STRENGTH PROPERTIES

**AS PER NZS 3603:1993 AMENDMENT 4**

## MSG Grades

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

* $f_s = 3.0$ MPa for Douglas Fir

## Verified Visual Grades

<table>
<thead>
<tr>
<th>VSG8</th>
<th>14.0</th>
<th>18.0</th>
<th>6.0</th>
<th>3.8*</th>
<th>8.0</th>
<th>5.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSG10</td>
<td>20.0</td>
<td>20.0</td>
<td>8.0</td>
<td>3.8*</td>
<td>10.0</td>
<td>6.7</td>
</tr>
</tbody>
</table>

## Unverified Visual Grades

<table>
<thead>
<tr>
<th>No 1 Framing (Unverified)</th>
<th>10.0</th>
<th>15.0</th>
<th>4.0</th>
<th>3.8*</th>
<th>6.0</th>
<th>4.0</th>
</tr>
</thead>
</table>

## Timber Sizes

<table>
<thead>
<tr>
<th>Call Size</th>
<th>Gauged Kiln Dried Size (in mm) (Actual Size)</th>
<th>Rough Sawn (in mm) (Actual Size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 x 50</td>
<td>90 x 45</td>
<td>100 x 50</td>
</tr>
<tr>
<td>150 x 50</td>
<td>140 x 45</td>
<td>150 x 50</td>
</tr>
<tr>
<td>200 x 50</td>
<td>190 x 45</td>
<td>200 x 50</td>
</tr>
<tr>
<td>250 x 50</td>
<td>240 x 45</td>
<td>250 x 50</td>
</tr>
<tr>
<td>300 x 50</td>
<td>290 x 45</td>
<td>300 x 50</td>
</tr>
<tr>
<td>100 x 100</td>
<td>90 x 90</td>
<td>100 x 100</td>
</tr>
<tr>
<td>150 x 100</td>
<td>140 x 90</td>
<td>150 x 100</td>
</tr>
<tr>
<td>200 x 100</td>
<td>190 x 90</td>
<td>200 x 100</td>
</tr>
<tr>
<td>250 x 100</td>
<td>240 x 90</td>
<td>250 x 100</td>
</tr>
<tr>
<td>300 x 100</td>
<td>290 x 90</td>
<td>300 x 100</td>
</tr>
</tbody>
</table>

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 5
- Durability Flow Chart 6
- Corrosion Zone Maps 8
# DURABILITY - PRODUCT SELECTION

## ALTERNATIVE SOLUTION FOR TABLE 4.1 NZS 3604:1999

<table>
<thead>
<tr>
<th>Zones</th>
<th>Environment</th>
<th>Product Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Zones</td>
<td>Closed (A)</td>
<td>GANG-NAIL and LUMBERLOK Standard Zinc Coated Product (^1)</td>
</tr>
<tr>
<td>Zones 1, 2, 3</td>
<td>Treated Timber Piles (Sub-floor) (B) Fixings BELOW 600mm from ground (C) Fixings ABOVE 600mm from ground</td>
<td>LUMBERLOK Stainless Steel 304 (^2) LUMBERLOK Hot Dip Galvanised (^1)</td>
</tr>
<tr>
<td>All Zones</td>
<td>Roof Spaces (D) Assumed Closed</td>
<td>GANG-NAIL and LUMBERLOK Standard Zinc Coated Product (^3)</td>
</tr>
<tr>
<td>Sea Spray Zones 1, 2, 3</td>
<td>Sheltered (E) (F, G) Vented MORE than 7000 mm²/m² (F, G) Vented LESS than 7000 mm²/m²</td>
<td>LUMBERLOK and BOWMAC Stainless Steel 304 (^2), LUMBERLOK Stainless Steel 304 (^3) and/or BOWMAC Hot Dip Galvanised (^2), LUMBERLOK and BOWMAC Hot Dip Galvanised (^1, 3)</td>
</tr>
<tr>
<td>Sea Spray Zones 1, 2, 3</td>
<td>Exposed (H) (I)</td>
<td>LUMBERLOK and BOWMAC Stainless Steel 304 (^2), LUMBERLOK Stainless Steel 304 (^3) and/or BOWMAC Hot Dip Galvanised (^2)</td>
</tr>
<tr>
<td>Zone 4</td>
<td>Geothermal Areas (J)</td>
<td>Refer to MiTek New Zealand Ltd.</td>
</tr>
</tbody>
</table>

## NOTES

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/m² 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.

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

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

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

ZONE
All Zones
Refer to NZS 3604 Fig 4.1

LOCATION
All locations within 50 metres of Geothermal hot spots

ENVIRONMENT
Closed

TREATMENT
Standard Zinc Coated Steel Product

All Brick Ties require specific engineering design

Sea Spray Zone

Closed

Standard Zinc Coated Steel Product

All Brick Ties in Sea Spray Zone to be Type 316 Stainless Steel

Sheltered and Exposed

Type 304 Stainless Steel

Outside Sea Spray Zone

Closed

Standard Zinc Coated Steel Product

Sheltered and Exposed

Post/footing and Beam/post connections, NZS 3604 Sect. 9

Hot Dip Galvanised Steel

Sheltered and Exposed

Fixings ABOVE 600mm from Ground level, for timber piles and poles

Hot Dip Galvanised Steel

Sheltered and Exposed

Fixings BELOW 600mm from Ground level, for timber piles and poles

Type 304 Stainless Steel

Sheltered and Exposed

All other structural fixings, specifically for Decking

Type 304 Stainless Steel

Product Key
- Standard Zinc Coated Steel Product
- Hot Dip Galvanised Steel Product
- Stainless Steel Product Type 304
SECTION 4 - DURABILITY

Note: The sea spray zone includes all offshore islands, the area within 500m of the coastline of New Zealand (see 4.2.3), and those areas shown in white.

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SECTION 4 - DURABILITY

Note: The sea spray zone includes all offshore islands, the area within 500m of the coastline of New Zealand (see 4.2.3), and those areas shown in white.

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Corrosion Zone map (continued)
6. FOUNDATION AND SUBFLOOR FRAMING

- Ordinary Pile Fixing 11
- 6kN Pile Fixing 12
- 12kN Pile Fixing 14
- 12kN Retro Subfloor Fixing 16
- 12kN Bearer Splice Over Pile 17
ORDINARY PILE FIXING

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

2 x 100mm Stainless Steel
Skew Nails into Pile

PRODUCT PACK CONTAINS
20 x Stainless Steel Wire Dogs
20 x 100mm x 4mm Stainless Steel Nails

Bearer

2 x Stainless Steel Wire Dogs
(1 per side)

Round Pile

Square Pile

If Square Piles are used, one Wire Dog needs to be bent as shown for face nailing into both Pile and Bearer

Available from leading Builders Supply Merchants throughout New Zealand
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

Available from leading Builders Supply Merchants throughout New Zealand
**6kN Joint Fixing Schedule**

**PILE TO BEARER**
- 2 x 90mm Galv. or St. Steel (H.C.)
  - Nails skew driven into Bearer.
- 4 x 90mm Skew Nails (1 per side) 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**
- 2 x 90mm 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
- 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

**CORROSION HAZARD USE TABLE**

<table>
<thead>
<tr>
<th>Medium Corrosion Pack (6kN MC)</th>
<th>High Corrosion Pack (6kN HC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Outside geothermal areas</td>
<td>- Sea Spray Zones</td>
</tr>
<tr>
<td>- Outside Sea Spray Zones</td>
<td>- All Fixings BELOW 600mm from Ground level</td>
</tr>
<tr>
<td>- If Joist to Bearer Fixings ABOVE 600mm from Ground level</td>
<td></td>
</tr>
</tbody>
</table>

**Pile to Bearer fixings**
- Stainless Steel (304).

**Joist to Bearer fixings**
- Hot Dip Galvanised.

- All items Stainless Steel (304).

**Refer front page for Product Finish Options**

**90mm Galvanised Nails not included.**
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

Available from leading Builders Supply Merchants throughout New Zealand
### 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)
- 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)

**NAILS**
- 2 x 90mm Galv. or Stainless Steel (H.C.)

### 12kN Bearer Splice

Clause 6.12.7.2
NZS 3604:1999

2 x 90mm Galv. or Stainless Steel (H.C.)
Nails skew driven into Bearer.

4 x CT160 Cleats per Joist
3 Nails per Joist and Bearer
2 x Nailon Plates
1mm x 160mm long per joint
8 Nails into Pile and Bearer
2 x 90mm Nails skew driven up into Bearer. 1 each side.

12kN Bearer Splice

Clause 6.12.7.2
NZS 3604:1999

- 2 x 90mm Galvanised Nails per end.  No Nails within 18mm of timber edge.
- 2 x 90mm Galv. or Stainless Steel (H.C.)
- 2 x 90mm Skew Nails per side.

### CORROSION HAZARD USE TABLE

<table>
<thead>
<tr>
<th>Standard Pack (12kN Std)</th>
<th>Medium Corrosion Pack (12kN MC)</th>
<th>High Corrosion Pack (12kN HC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Outside geothermal areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Outside Sea Spray Zones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- All Fixings ABOVE 600mm from Ground level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pile to Bearer fixings Stainless Steel (304).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Only Joist to Bearer Fixings ABOVE 600mm from Ground level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- All Fixings Stainless Steel (304).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 12kN Fixings

**Braced Pile**
- Parent Pile
- 12kN Fixing - Pile to Bearer
- 4 x CT160 Cleats per Joist
- 3 Nails per Joist and Bearer
- 2 x Nailon Plates

**Ordinary Pile**
- Parent Pile
- 12kN Fixing - Pile to Bearer
- 4 x CT160 Cleats per Joist
- 3 Nails per Joist and Bearer
- 2 x Nailon Plates

**Joist**
- 45 45
- Nailon Plate 1mm x 160mm long (ex 12kN Pack)
- 8 Nails per end.  No Nails within 18mm of timber edge.

**Bearers**
- 140mm min. Diameter Pile
- 2 x 90mm Skew Nails per side.

### 90mm Galvanised Nails not included.
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
12kN BEARER SPLICE OVER PILE
AS PER CLAUSE 6.12.7 NZS 3604:1999

Available from leading Builders Supply Merchants throughout New Zealand
7. FLOOR

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6kN FLOOR JOIST SPLICE OVER BEARER
AS PER CLAUSE 7.1.1.7(c) NZS 3604:1999

Fix each joist to bearer with
2 x 100mm x 3.75 dia. nails

Available from leading Builders Supply Merchants throughout New Zealand
JOIST HANGERS

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.

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.

DIMENSIONS

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.

IMPORTANT NOTE

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 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

Characteristic Load - Nails

<table>
<thead>
<tr>
<th>Joist Hanger Type</th>
<th>No. of Nails per Flange*</th>
<th>Down</th>
<th>Uplift</th>
</tr>
</thead>
<tbody>
<tr>
<td>47 x 90</td>
<td>3</td>
<td>9.0 kN</td>
<td>6.0 kN</td>
</tr>
<tr>
<td>47 x 120</td>
<td>5</td>
<td>15.0 kN</td>
<td>10.0 kN</td>
</tr>
<tr>
<td>47 x 190</td>
<td>9</td>
<td>27.0 kN</td>
<td>18.0 kN</td>
</tr>
<tr>
<td>95 x 165</td>
<td>8</td>
<td>24.0 kN</td>
<td>16.0 kN</td>
</tr>
<tr>
<td>70 x 180</td>
<td>8</td>
<td>24.0 kN</td>
<td>16.0 kN</td>
</tr>
</tbody>
</table>

* 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

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.

<table>
<thead>
<tr>
<th>Joist Size</th>
<th>Recommended Joist Hanger</th>
<th>Domestic Floors &amp; Balconies Min. No. of Nails Per Flange (4 Flanges Total)</th>
<th>Commercial Floors Min. No. of Nails Per Flange (4 Flanges Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 x 50</td>
<td>JH 47 x 90</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>150 x 50</td>
<td>JH 47 x 90</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>200 x 50</td>
<td>JH 47 x 120</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>250 x 50</td>
<td>JH 47 x 190</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>300 x 50</td>
<td>JH 47 x 190</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

SCREW FIXING RECOMMENDATION
Fix with Type 17-12g x 35mm Hex Head Screws

<table>
<thead>
<tr>
<th>Joist Size</th>
<th>Recommended Joist Hanger</th>
<th>Domestic Floors &amp; Balconies No. of Screws Per Flange (4 Flanges Total)</th>
<th>Commercial Floors No. of Screws &amp; Nails Per Flange (4 Flanges Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 x 50</td>
<td>JH 47 x 90</td>
<td>1</td>
<td>1 Screw + 1 Nail</td>
</tr>
<tr>
<td>150 x 50</td>
<td>JH 47 x 90</td>
<td>1</td>
<td>1 Screw + 1 Nail</td>
</tr>
<tr>
<td>200 x 50</td>
<td>JH 47 x 120</td>
<td>2</td>
<td>2 Screws + 2 Nails</td>
</tr>
<tr>
<td>250 x 50</td>
<td>JH 47 x 190</td>
<td>2</td>
<td>2 Screws + 2 Nails</td>
</tr>
<tr>
<td>300 x 50</td>
<td>JH 47 x 190</td>
<td>3</td>
<td>3 Screws + 2 Nails</td>
</tr>
</tbody>
</table>
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 ($\phi_s = 0.50$).
Establishing Thickening & Stud Requirements

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

<table>
<thead>
<tr>
<th>Truss List</th>
<th>Qty</th>
<th>Span (mm)</th>
<th>Joint</th>
<th>Bearing Reactions (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Trusses</td>
<td></td>
<td></td>
<td></td>
<td>Down</td>
</tr>
<tr>
<td>GT01</td>
<td>1</td>
<td>8000</td>
<td>J</td>
<td>[16.177]</td>
</tr>
</tbody>
</table>

Girder truss GT01

Maximum down value = -16.177kN

375 x 375 Square pad as per detail FP1

2 Studs required under truss

SINGLE STUD OPTION

Top plate arrangement as per NZS 3604:1999

Truss can be located anywhere on the top plate

MULTIPLE STUD OPTION

*Max 50mm tolerance for truss location

Top plate arrangement as per NZS 3604:1999

Multiple studs as indicated by design table on page 3
**Slab Thickening & Stud Requirement Table**

**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).

- **Slab Thickening Details**
  - **CONCRETE PAD OPTIONS** (for concentrated loads)
    - Stud wall as per NZS 3604:1999
    - Standard 100mm reinforced & unreinforced slab, as per NZS 3604:1999
  - **CONTINUOUS CONCRETE THICKENING OPTIONS** (for uniformly distributed loads)
    - Stud wall as per NZS 3604:1999
    - Standard 100mm reinforced or unreinforced slab, as per NZS 3604:1999

**Stud Requirements**

<table>
<thead>
<tr>
<th>TRUSS BEARING REACTION</th>
<th>SLAB THICKENING DETAIL</th>
<th>STUD REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CONCENTRATED LOAD</td>
<td>UNIFORM DIST LOAD</td>
</tr>
<tr>
<td>Bearing reaction up to &amp; including 10kN</td>
<td>STANDARD unreinforced or reinforced slab as per NZS 3604:1999</td>
<td>STUD Height: 2400, 2700, 3000, STUD Requirements: Refer to NZS 3604:1999</td>
</tr>
<tr>
<td>Bearing reaction up to &amp; including 20kN</td>
<td>TYPE FP1 375 x 375 PAD</td>
<td>STUD Height: 2400, STUD NO's UNDER TRUSS: 2, MIN. TIMBER SIZE: 90 x 35</td>
</tr>
<tr>
<td>Bearing reaction up to &amp; including 30kN</td>
<td>TYPE FP2 450 x 450 PAD</td>
<td>STUD Height: 2400, STUD NO's UNDER TRUSS: 3, MIN. TIMBER SIZE: 90 x 45</td>
</tr>
</tbody>
</table>

**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.
- For loads up to 10kN select studs from the 20kN table.
- For loads above 20kN Special Design is required.

---

**NOTE:**
- FP = Foundation Pad
- FS = Foundation Strip
Retro Fitted Load Bearing Option

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

- Studs as per table on page 3
- 6 / 90mm nails through studs into bottom lintel at each end
- 2 / 300 x 50 or 1 / 300 x 100 bottom lintel. Nail as standard pre-cut details

Uniformly Distributed Loads

- TRUSSES LOADING ON TO TOP PLATE UNIFORMLY (locations indicative only)
- Number of studs shown indicative only
- 6 / 90mm nails through studs into bottom lintel at each end
- 2 / 300 x 50 or 1 / 300 x 100 bottom lintel. Nail as standard pre-cut details
8. WALLS

- Stud to Top Plate Fixing Schedule 27
- Lintel Fixing Schedule 28
- FLEXIBRACE - Installation Guide 30
- 6kN Stud to Bottom Plate Fixing 32
- 12kN Stud to Bottom Plate Fixing 33
- GIB HandiBrac 34
- Sheet Brace Straps 38
- Header Block Anchor 39
- Bottom Plate Fixing Anchor 41
- Top Plate Jointing 43
- Top Plate Stiffener 44
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.
- Wall framing arrangements under girder trusses are not covered in this schedule.
- All timber selections are as per NZS 3604:1999.

Note: TYLOK options on timber species.

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
  - LUMBERLOK Stud Tie

- **FIXING TYPE C**
  - 2.7kN
  - 2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.
  - Plus
  - LUMBERLOK Stud Tie

- **FIXING TYPE D**
  - 6.0kN
  - 2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.
  - Plus
  - LUMBERLOK Stud Anchor

Fixed Selection Chart

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

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

Fixed Dimension Definition

- External wall Standard truss
- External wall Internally supported truss
- External wall Rafter roof
- Internal wall Internally supported truss
- Multiple internal walls

Fixed Selection Chart

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

<table>
<thead>
<tr>
<th>Loaded Dimension (m)</th>
<th>Light Roof</th>
<th>Heavy Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stud Centres</td>
<td>Wind Zone</td>
</tr>
<tr>
<td>400mm 600mm</td>
<td>L M H VH</td>
<td>L M H VH</td>
</tr>
<tr>
<td>2.25 1.5</td>
<td>A A B B A A B</td>
<td>A A B B A A B</td>
</tr>
<tr>
<td>3.0  2.0</td>
<td>A B B C A A B</td>
<td>A B B C A A B</td>
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<td>A B C C A A C</td>
<td>A B C C A A C</td>
</tr>
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<td>B B B B A A B</td>
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<td>B B C D A A B</td>
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<td>B C D D A A C</td>
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<td>B C D D A A C</td>
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<td>7.5  5.0</td>
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<td>9.0  6.0</td>
<td>B C D A B A B D</td>
<td>B C D A B A B D</td>
</tr>
</tbody>
</table>
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.
★ Wall framing arrangements under girder trusses are not covered in this schedule.
★ All timber selections are as per NZS 3604:1999.
★ Note: TYLOK options on timber species.

SELECTION CHART FOR LINTEL FIXING

<table>
<thead>
<tr>
<th>Lintel Span</th>
<th>Loaded Dimension (See Fig. 1.3 NZS 3604:1999)</th>
<th>Light Roof</th>
<th>Heavy Roof</th>
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<tbody>
<tr>
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<td>2.0</td>
<td>F</td>
<td>G</td>
</tr>
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<td>2.0</td>
<td>G</td>
<td>G</td>
</tr>
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<td>G</td>
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<td>H</td>
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<td>H</td>
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<td>H</td>
</tr>
<tr>
<td>6.0</td>
<td>2.0</td>
<td>G</td>
<td>H</td>
</tr>
</tbody>
</table>

NOTES:
Lintels supporting Girder trusses for ALL load cases use:
Fixing Type G where contributary area = 10m²
Fixing Type H where contributary area = 20m²
All cases outside this require specific design.
LINTEL FIXING OPTIONS

**TYPE E**

- 1.4kN

- 4 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel

- Lintel

- Tylok 2T4 one side

- 90mm x 3.15 dia. nails directly below lintel
- 90mm x 3.15 dia. nails
- Trimmer to understud at 250mm crs.

- Stud numbers indicative only. Refer Table 8.5 NZS 3604:1999

- For fixing of jack studs to lintel & top plate, refer to "Stud to Top Plate Fixing Schedule".

**TYPE F**

- 4.0kN

- 6 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel

- Lintel

- Tylok 2T4 one side

- 90mm x 3.15 dia. nails directly below lintel
- 90mm x 3.15 dia. nails
- Trimmer to understud at 250mm crs.

- Stud numbers indicative only. Refer Table 8.5 NZS 3604:1999

- For fixing of jack studs to lintel & top plate, refer to "Stud to Top Plate Fixing Schedule".

**TYPE G**

- 7.5kN

- 6 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel (typical)

- Lintel

- Tylok 2T4 one side

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails at 250 crs. trimmer to understud (typical)

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**TYPE H**

- 13.5kN

- 8 x 90mm x 3.15 dia. nails
- 400mm Sheet Brace
- Strap to both sides

- Lintel

- Tylok 10T10 to both sides

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails into bottom plate

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**LINTEL FIXING OPTIONS**

**TYPE G**

- 7.5kN

- 6 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel (typical)

- Lintel

- Tylok 2T4 one side

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails at 250 crs. trimmer to understud (typical)

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**LINTEL FIXING OPTIONS**

**TYPE H**

- 13.5kN

- 8 x 90mm x 3.15 dia. nails
- 400mm Sheet Brace
- Strap to both sides

- Lintel

- Tylok 10T10 to both sides

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails into bottom plate

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**LINTEL FIXING OPTIONS**

**TYPE E**

- 1.4kN

- 4 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel

- Lintel

- Tylok 2T4 one side

- 90mm x 3.15 dia. nails directly below lintel
- 90mm x 3.15 dia. nails
- Trimmer to understud at 250mm crs.

- Stud numbers indicative only. Refer Table 8.5 NZS 3604:1999

- For fixing of jack studs to lintel & top plate, refer to "Stud to Top Plate Fixing Schedule".

**LINTEL FIXING OPTIONS**

**TYPE F**

- 4.0kN

- 6 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel

- Lintel

- Tylok 2T4 one side

- 90mm x 3.15 dia. nails directly below lintel
- 90mm x 3.15 dia. nails
- Trimmer to understud at 250mm crs.

- Stud numbers indicative only. Refer Table 8.5 NZS 3604:1999

- For fixing of jack studs to lintel & top plate, refer to "Stud to Top Plate Fixing Schedule".

**LINTEL FIXING OPTIONS**

**TYPE G**

- 7.5kN

- 6 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel (typical)

- Lintel

- Tylok 2T4 one side

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails at 250 crs. trimmer to understud (typical)

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**LINTEL FIXING OPTIONS**

**TYPE H**

- 13.5kN

- 8 x 90mm x 3.15 dia. nails
- 400mm Sheet Brace
- Strap to both sides

- Lintel

- Tylok 10T10 to both sides

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails into bottom plate

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**LINTEL FIXING OPTIONS**

**TYPE E**

- 1.4kN

- 4 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel

- Lintel

- Tylok 2T4 one side

- 90mm x 3.15 dia. nails directly below lintel
- 90mm x 3.15 dia. nails
- Trimmer to understud at 250mm crs.

- Stud numbers indicative only. Refer Table 8.5 NZS 3604:1999

- For fixing of jack studs to lintel & top plate, refer to "Stud to Top Plate Fixing Schedule".

**LINTEL FIXING OPTIONS**

**TYPE F**

- 4.0kN

- 6 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel

- Lintel

- Tylok 2T4 one side

- 90mm x 3.15 dia. nails directly below lintel
- 90mm x 3.15 dia. nails
- Trimmer to understud at 250mm crs.

- Stud numbers indicative only. Refer Table 8.5 NZS 3604:1999

- For fixing of jack studs to lintel & top plate, refer to "Stud to Top Plate Fixing Schedule".

**LINTEL FIXING OPTIONS**

**TYPE G**

- 7.5kN

- 6 x 90mm x 3.15 dia. nails
- 2 x 90mm x 3.15 dia. nails directly below lintel (typical)

- Lintel

- Tylok 2T4 one side

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails at 250 crs. trimmer to understud (typical)

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**LINTEL FIXING OPTIONS**

**TYPE H**

- 13.5kN

- 8 x 90mm x 3.15 dia. nails
- 400mm Sheet Brace
- Strap to both sides

- Lintel

- Tylok 10T10 to both sides

- 6 x 30mm x 3.15 dia. nails to each stud

- 90mm x 3.15 dia. nails into bottom plate

- M12 proprietary concrete fixing bolt with 50x50x3mm square washer or M12 x 150mm coach screw with 50x50x3mm square washer into timber joist/bearer

**LINTEL FIXING OPTIONS**
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

Position Struts equally both ends

Fix centrally on stud face with 1 x Type 17-14g x 35mm Screw

Wrap Sheet Brace Strap under bottom plate. Fix with LUMBERLOK Product Nails 30mm x 3.15 dia. 6 nails on each side of stud and 3 nails on each side of bottom plate.

100mm max.

Bottom Plate Fixing (not included as part of pack)

- M12 x 150mm concrete fixing bolt with 50x50x3mm washer into concrete floor.
- Alternatively, M12 x 150mm galvanised coach screw with 50x50x3mm washer into timber joists.

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
 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

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
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

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
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

**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

**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

**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® 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.
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

- 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
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

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

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.
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).

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.

**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.

**Fig. 3**
- Stud
- Block
- 75mm x 4mm dia. Nail
- 900mm centres max.
- 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**
- 7kN In the Plane Horizontal
- 9kN Vertical
- 7kN Out of Plane Horizontal
- Characteristic Load
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.
**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.

**Characteristic Load**

- 8kN Vertical
- 7kN Out of plane Horizontal
- 7kN In the plane Horizontal
TOP PLATE JOINTING
AS PER CLAUSE 8.7.3 NZS 3604:1999

Top Plates at Right Angles

<table>
<thead>
<tr>
<th>Connection capacity</th>
<th>LUMBERLOK Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 kN</td>
<td>Tylok 6T10 OR 2 x Strap Nails</td>
</tr>
<tr>
<td>12 kN</td>
<td>2 x Sheet Brace Straps fixed with 6 x LUMBERLOK Product Nails 30mm x 3.15 dia. per end per strap (24 nails total)</td>
</tr>
</tbody>
</table>

Top Plates in Line

<table>
<thead>
<tr>
<th>Connection capacity</th>
<th>LUMBERLOK Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 kN</td>
<td>Tylok 6T5 OR Strap Nail</td>
</tr>
<tr>
<td>6 kN</td>
<td>Tylok 6T10 OR 2 x Strap Nails</td>
</tr>
</tbody>
</table>

Available from leading Builders Supply Merchants throughout New Zealand
★ For internal vacuum systems ducting
★ Reinforces the top plate back to FULL STRENGTH!
★ Alternative solution to Figure 8.20 NZS 3604:1999
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.

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

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

- Producer Statement - PS1 - Design 47
- Design Information 48
- Post & Bearer Brackets 49
- Angle Brackets Without Gusset 51
- Angle Brackets With Gusset 53
- Heavy Duty Short Angle Brackets 54
- Strap, T & L Brackets 55
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)
BUILDING WITH BOWMAC®

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 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
These drawings are the property of MiTek New Zealand Ltd and must not be copied or reproduced without permission.
**POST & BEARER BRACKETS**

**BRACKET RANGE**

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

**Typical Use**

1. **Saddle**
   - Bolts Only
   - Min. edge distance for bracket stem: 50mm
   - Bolt holes accommodate M12 Bolt unless noted.

2. **Rag Strap**
   - Min. edge distance for bracket stem: 50mm
   - Nail holes to accommodate 40mm x 3.15 dia. Flat Head square twisted shank nails. Hot dip galvanised.

3. **Pipe Insert**
   - Hole size, allow 1mm clearance max.
   - Min. edge distance for bracket stem: 50mm

**On-Site fitted dimensions**

- 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)

**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.

---

**BOWMAC® STRUCTURAL BRACKETS DESIGN DETAILS**
### Building with Bowmac®

**Post & Bearer Brackets**

**Foundation Details**
- For minimum volume of concrete required for each bracket refer to chart below.
- Minimum concrete strength 17 MPa

**Example Areas**
- Contributory area on connection ‘C1’ = \((S \times B) / 4 + (O / H) \times B / 2 + (O / H) \times S / 2 + (2 \times O / H)\)
- Contributory area on connection ‘C2’ = \((S / 2 + O / H) \times B\)

**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

**Load Table**

<table>
<thead>
<tr>
<th>Roof Weight</th>
<th>Wind</th>
<th>Snow</th>
<th>Max. Roof Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light*</td>
<td>L</td>
<td>0.5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>0.5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>0.7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>VH</td>
<td>1.0</td>
<td>4</td>
</tr>
<tr>
<td>Heavy*</td>
<td>L</td>
<td>0.5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>0.5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>0.7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>VH</td>
<td>1.0</td>
<td>5</td>
</tr>
</tbody>
</table>

**Max. Concrete Footing Volume Table**

<table>
<thead>
<tr>
<th>Roof Weight</th>
<th>Wind</th>
<th>Roof Area Supported (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light*</td>
<td>L</td>
<td>0.03 0.07 0.10 0.15 0.15 0.20 0.25 0.30 0.35 0.50 0.60 0.70 0.80 0.95</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>0.05 0.10 0.15 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.95</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.95</td>
</tr>
<tr>
<td></td>
<td>VH</td>
<td>0.13 0.26 0.40 0.50 0.60 0.70 0.80 0.95</td>
</tr>
<tr>
<td>Heavy*</td>
<td>L &amp; M</td>
<td>No securment required for uplift. Minimum footing of 0.1m² for bracket fixing.</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.48</td>
</tr>
<tr>
<td></td>
<td>VH</td>
<td>0.07 0.13 0.20 0.26 0.32 0.40 0.48</td>
</tr>
</tbody>
</table>

* Refer to NZS 3604:1999 for specific roof weights. (Allowance of roof lining up to 20kg/m² has been made).
Concrete volumes for roof area beyond 14m² can be increased on a pro-rata basis.
**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**

- 12mm Coach screws
- Poured concrete 17 MPa
- 12mm Dynabolt (Shank size 10mm)
**EXAMPLE AREAS**
- Contributory area on connection 'C1' = \( (S \times B)/4 + (O/H \times B)/2 + (O/H \times S)/2 + (2 \times O/H) \)
- Contributory area on connection 'C2' = \( (S/2 + O/H) \times B \)

**LOAD TABLE**

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<thead>
<tr>
<th>Roof Weight</th>
<th>Wind</th>
<th>Max. Roof Area (m²)</th>
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</thead>
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<td></td>
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</tr>
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<td></td>
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<td></td>
<td>VH</td>
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<table>
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<tr>
<th>Roof Weight</th>
<th>Wind</th>
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</thead>
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<td>Light</td>
<td>L</td>
<td>0.03 0.07 0.10 0.15 0.15 0.20 0.25 0.30 0.35</td>
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<tr>
<td></td>
<td>M</td>
<td>0.05 0.10 0.15 0.20 0.25 0.30 0.35</td>
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<tr>
<td></td>
<td>H</td>
<td>0.10 0.20 0.30 0.40 0.50 0.60 0.70</td>
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<td>0.13 0.26 0.40 0.50 0.65 0.80 0.95</td>
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<table>
<thead>
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<th>Roof Weight</th>
<th>Wind</th>
<th>Max. Roof Area Supported (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy*</td>
<td>L &amp; M</td>
<td>0.05 0.10 0.15 0.20 0.25 0.30 0.35</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>0.07 0.13 0.20 0.26 0.32 0.40 0.48</td>
</tr>
</tbody>
</table>

* Refer to NZS 3604:1999 for specific roof weights. (Allowance of roof lining up to 20kg/m² has been made).

Concrete volumes for roof area beyond 14m² can be increased on a pro-rata basis.
**BRACKET RANGE**
- B163 and B165

**TYPICAL USE**

- Bracket designed to carry live load of 3.0 kPa.

**FIXING NOTE**
- All bolt holes accommodate M12 Bolt unless noted.

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

**BRACKET SPACING TABLE**

<table>
<thead>
<tr>
<th>Bracket</th>
<th>Max. Spacing 'S'</th>
</tr>
</thead>
<tbody>
<tr>
<td>B163</td>
<td>2.0m</td>
</tr>
<tr>
<td>B165</td>
<td>2.0m</td>
</tr>
</tbody>
</table>

**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**

**LAYOUT & LOAD DIMENSIONS**

<table>
<thead>
<tr>
<th>Roof Weight</th>
<th>Wind</th>
<th>Snow</th>
<th>Bracket Type 1</th>
<th>Bracket Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>L</td>
<td>0.5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>0.5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>H</td>
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<td>6</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>VH</td>
<td>1.0</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Heavy</td>
<td>L</td>
<td>0.5</td>
<td>5</td>
<td>6</td>
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<tr>
<td></td>
<td>M</td>
<td>0.5</td>
<td>5</td>
<td>6</td>
</tr>
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<td>0.7</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>VH</td>
<td>1.0</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**LOAD TABLE**

**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**

**LAYOUT & LOAD DIMENSIONS**

<table>
<thead>
<tr>
<th>Roof Weight</th>
<th>Wind</th>
<th>Snow</th>
<th>Bracket Type 1</th>
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<td>Light</td>
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<td>0.7</td>
<td>6</td>
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</tr>
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<td></td>
<td>VH</td>
<td>1.0</td>
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<td>6</td>
</tr>
<tr>
<td>Heavy</td>
<td>L</td>
<td>0.5</td>
<td>5</td>
<td>6</td>
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<tr>
<td></td>
<td>M</td>
<td>0.5</td>
<td>5</td>
<td>6</td>
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<td></td>
<td>H</td>
<td>0.7</td>
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<td></td>
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<td>1.0</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**BOWMAC® STRUCTURAL BRACKETS**

**DESIGN DETAILS**

**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**
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

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.

LOAD TABLE

<table>
<thead>
<tr>
<th>Roof Weight</th>
<th>Wind</th>
<th>Snow</th>
<th>Max. Roof Area All Brackets (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>L</td>
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<td>7</td>
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<tr>
<td></td>
<td>M</td>
<td>0.5</td>
<td>7</td>
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<tr>
<td></td>
<td>H</td>
<td>0.7</td>
<td>6</td>
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<td></td>
<td>VH</td>
<td>1.0</td>
<td>4</td>
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<td>Heavy</td>
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<td>0.5</td>
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</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>H</td>
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<tr>
<td></td>
<td>VH</td>
<td>1.0</td>
<td>4</td>
</tr>
</tbody>
</table>
10. ROOF FRAMING

- Truss Installation Manual
- Hip Board Strut
- Purlin & Batten Fixing Chart
- 9kN Truss to Top Plate Fixing
- 16kN Truss to Top Plate Fixing
- Concealed Purlin Cleat
- Roof Bracing Specification
INSTALLATION

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 60° 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).
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

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

Figure 2
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).

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.

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

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.

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.
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™

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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.

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 WIREDOG

OR

2 SCREWS

---

**PURLIN / BATTEN SPLICE FIXING OPTIONS**

**NOTE:**

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

---

**BLUE SCREW**

**FIXING TOLERANCE**

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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
16kN TRUSS TO TOP PLATE FIXING

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

8 x Product Nails 30mm x 3.15 dia.
per CPC80 Cleat

16kN

CPC80 Cleats both sides

Top Plate Packer

Rafter/Truss

Top Plate

4 x Type 17-14g x 75mm Screws
per CPC80 Cleat

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
CONCEALED PURLIN CLEATS
FOR FIXING PURLINS TO EXPOSED RAFTERS

★ Quick and Easy to Apply
★ Resists High Wind Uplift

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

NOT TO BE USED IN EXTERIOR SITUATIONS
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.

---

**DIMENSIONS AND NAILING**

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<tr>
<th>CPC40S (short)</th>
<th>CPC40</th>
<th>CPC80</th>
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<tr>
<td>Rafter Width (nominal)</td>
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<tr>
<td>LUMBERLOK Product Nails</td>
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<td>85mm</td>
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<tr>
<td>2 x 14g x 35mm Screws</td>
<td>2 x 14g x 35mm Screws</td>
<td>4 x 14g x 35mm Screws</td>
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**Uplift Direction**

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<th>CPC40S</th>
<th>CPC40</th>
<th>CPC80</th>
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<tbody>
<tr>
<td>5 kN/pair</td>
<td>9 kN/pair</td>
<td>16 kN/pair</td>
<td></td>
</tr>
</tbody>
</table>

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**
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

1. The bracing described in this brochure covers both framed roofs and fully trussed roofs.

2. Roof plane areas less than 6m² (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

Roof Weight

Light
- Gable
  - 1 Roof Plane Brace
    per 50m² of Roof Plane Area
  - OR
    - 1 Roof Space Brace
      at each end of ridge
      and at max. 7.5m crs.
      along ridge line
- Hip
  - Min. 3 Hip or Valley rafters. Or as per
    Light Gable Roof

Heavy
- Gable
  - 1 Roof Plane Brace
    per 25m² of Roof Plane Area
  - PLUS
    - A Roof Space Brace per 12m²
      of roof area, and located not more
      than 2m from ridge line
- Hip
  - 1 Roof Plane Brace
    per 35m² of Roof Plane Area. Min. 3 Hip or Valley rafters
  - Check for Ceiling Plane Brace requirements on pg.4 of this brochure

Roof Plane Brace & Installation

Single tensioned crossed
LUMBERLOK Strip Brace
over top chords/rafters

5 / 30 x 3.15
nails each end

5 / 30 x 3.15 nails
each end

1 / 30 x 3.15 nail
at crossing

When purlin depth above truss chord is 50mm or less, Strip Brace can be installed over top of purlins

Alternative Layout Options

Single Cross @ 45°

Double Cross @ 45°

Quadruple Cross @ 45°
Roof Space Brace Installation

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

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.

100 x 50 ceiling plane braces fixed to each truss chord with 2 / 90mm nails

Top plate
(no wall framing shown)

Hip rafter

3 / 90mm nails

* 2.5m max.

B

3 / 90mm nails per brace

* Typical for all roof widths

(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.
20. INDUSTRY INFORMATION

- LUMBERLOK® Timber Connectors 75
- LUMBERLOK® Producer Statement 81
- BOWMAC® Structural Brackets Catalogue 82
- BOWMAC® Producer Statement 88
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.
ANGEL 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.

*MULTI-BRACE

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

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

.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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Width</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>2T5</td>
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<td>60mm</td>
</tr>
<tr>
<td>4T5</td>
<td>34mm</td>
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<tr>
<td>14T10</td>
<td>68mm</td>
<td>420mm</td>
</tr>
<tr>
<td>16T10</td>
<td>68mm</td>
<td>480mm</td>
</tr>
</tbody>
</table>

Tylko Plate 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
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

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

<table>
<thead>
<tr>
<th>Plate thickness</th>
<th>1.0mm</th>
<th>2.0mm</th>
<th>3.0mm</th>
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</thead>
<tbody>
<tr>
<td>Width</td>
<td>110mm</td>
<td>113mm</td>
<td>130 or 240mm</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Normal Rafter Width</th>
<th>50</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleat</td>
<td>CPC40 or CPC40S</td>
<td>CPC80</td>
</tr>
</tbody>
</table>

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.
**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**

0.91mm 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**

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**

Available 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.
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.
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/m².

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)
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

STRAPS

* Similar also available in stainless steel 304-2B Refer to brochure
**ANGLE BRACKETS (No Gusset)**

- [B86]
- [B88]

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

**ANGLE BRACKETS (With Gusset)**

- [B165]

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

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**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.

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

**BOLTS NOT INCLUDED**

† Available in Powder Coated White or Brown

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**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.

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

**BOLTS NOT INCLUDED**

† Available in Powder Coated White or Brown

---

**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.

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

*B175  B177  B178*

**BOLT SIZES**

All bolt holes to accommodate M12 Bolts unless noted.

*B176  B178*

**Z & L BEAM SUPPORTS**

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

*B110  B119  B199*

**B155 POLE BRACE BRACKET**  **B145 POLE BRACE BRACKET**

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

**B128 POLE BEAM BRACKET**

**POLE CONSTRUCTION DETAILS**

*BOLTS & WASHERS NOT INCLUDED*
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

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