STRUCTURAL FIXINGS
ON-SITE GUIDE FOR BUILDING CODE COMPLIANCE

2012 EDITION

Revised for NZS 3604:2011
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.

Characteristic Loadings Data for LUMBERLOK® Timber Connectors and BOWMAC® Structural Brackets are not covered in their entirety in this booklet. Refer to separate brochures for design values.

The applications in this site guide are to be configured in accordance with the instructions. Substitution of specified or recommended components with alternative brands may compromise performance.

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, Botany 2163  
Phone: 09-274 7109  
Fax: 09-274 7100

**CHRISTCHURCH**  
PO Box 8387, Riccarton 8440  
Phone: 03-348 8691  
Fax: 03-348 0314

A downloadable pdf version of this booklet is available on our website www.miteknz.co.nz.
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 3604:2011 Timber Framed Buildings.

LUMBERLOK products are distributed nationwide, and are available from leading Builders Supply Merchants and Hardware outlets throughout New Zealand.
ANGLE BRACE
0.85mm G300 Z275 Galvanised Steel

Angle Brace may be used as either compression or tension brace.
Nail holes are fully punched for ease of nailing.
Fix with 60mm x 3.15mm diameter nails.
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.
Refer to Characteristic Loadings Brochure for design values.

STRIP BRACE
0.55mm x 27mm G550 Z275 Galvanised Steel
0.91mm x 25mm G300 Z275 Galvanised Steel (Export Grade)

Strip Brace is supplied in 10m, 15m and 30m coils for use as bracing or in
short lengths as a jointing material.
Strip Brace provides an ideal bracing system for walls, or roof plane.
One crossed pair of strips may be used in each location where a diagonal
brace is required. Fix using 5 x LUMBERLOK Product Nails 30mm x 3.15mm
diameter at each end.
A heavier gauge Export Grade (item suffix EX) is also available in 10m and
30m coils. Tensioners are included with marked boxes of Strip Brace coils
or available separately if required.
Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304. (Stainless Steel tensioners not available)

*MULTI-BRACE
0.91mm x 53mm G300 Z275 Galvanised Steel

This product has been developed for commercial building situations as an alternative
to steel rod or timber as a bracing element. Coils are available in lengths of 10m,
15m and 30m, punched to allow easy fixing, using 11 x LUMBERLOK Product
Nails 30mm x 3.15mm diameter 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)

*SHEET BRACE STRAPS
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 3604:2011, a
6kN capacity can be obtained by one strap (6 nails per strap end) or 12kN per
two straps (6 nails per strap end). Fixed with LUMBERLOK Product Nails 30mm
x 3.15mm diameter.
Refer to brochure for application data.
Available in Stainless Steel 304.

* Detailed product sheet available
*JOIST HANGERS*

0.91mm G300 Z275 Galvanised Steel

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 LUMBERLOK Product Nails 30mm x 3.15mm diameter, or Type 17-12g x 35mm Hex Head Screws.

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

**TYLOK PLATES**

0.95mm G300 Z275 Galvanised Steel

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 Characteristic 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>
<td>34mm</td>
<td>60mm</td>
</tr>
<tr>
<td>4T5</td>
<td>34mm</td>
<td>120mm</td>
</tr>
<tr>
<td>6T5</td>
<td>34mm</td>
<td>180mm</td>
</tr>
<tr>
<td>8T5</td>
<td>34mm</td>
<td>240mm</td>
</tr>
<tr>
<td>10T5</td>
<td>34mm</td>
<td>300mm</td>
</tr>
<tr>
<td>12T5</td>
<td>34mm</td>
<td>360mm</td>
</tr>
<tr>
<td>14T5</td>
<td>34mm</td>
<td>420mm</td>
</tr>
<tr>
<td>16T5</td>
<td>34mm</td>
<td>480mm</td>
</tr>
<tr>
<td>Coil T5</td>
<td>34mm</td>
<td>15m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Width</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4T15</td>
<td>102mm</td>
<td>120mm</td>
</tr>
<tr>
<td>6T15</td>
<td>102mm</td>
<td>180mm</td>
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<tr>
<td>8T15</td>
<td>102mm</td>
<td>240mm</td>
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<tr>
<td>10T15</td>
<td>102mm</td>
<td>300mm</td>
</tr>
<tr>
<td>12T15</td>
<td>102mm</td>
<td>360mm</td>
</tr>
<tr>
<td>Coil T15</td>
<td>102mm</td>
<td>15m</td>
</tr>
</tbody>
</table>

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

**TYLOK ANGLES**

0.95mm G300 Z275 Galvanised Steel

Available internal (Int.) or external (Ext.) versions

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3A6</td>
<td>35mm x 35mm x 90mm</td>
</tr>
<tr>
<td>5A6</td>
<td>35mm x 35mm x 150mm</td>
</tr>
<tr>
<td>6A6</td>
<td>35mm x 35mm x 180mm</td>
</tr>
</tbody>
</table>

* Detailed product sheet available
WIRE DOGS (LH, RH or STAPLE)

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 Dogs 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.

*12kN & 6kN PILE FIXINGS

Both these products comply with NZS 3604:2011 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.

*9kN & 16kN TRUSS TO TOP PLATE FIXINGS

Used in pairs, the CPC40 cleats achieve 9kN and the CPC80 cleats for 16kN. The required pack comes supplied with the appropriate cleats, nails and Type 17-14g x 75mm Hex Head Screws to penetrate through the timber top plate packer and into the top plate. Compliant with NZS 3604:2011, these conveniently top mounted fixings allow additional face fixing if required.

GIRT PLATE

0.91mm G300 Z275 Galvanised Steel

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 LUMBERLOK Product Nails 30mm x 3.15mm diameter each face (16/cleat).

Available in Stainless Steel 304.
CEILING TIES CT160 & CT200 (LH or RH)
0.95mm NZCC-2D Hot Dip Galvanised Steel (CT160)
0.91 G300 Z275 Galvanised Steel (CT200)
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. Fix with LUMBERLOK Product Nails 30mm x 3.15mm diameter.
Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304.

CYCLONE TIES CT400 & CT600
0.91mm G300 Z275 Galvanised Steel
Overall length 400mm and 600mm – Designed specifically for fixing down rafters or purlins in high wind situations. These are produced in straight pre-twisted lengths which are then folded over timber members on-site, therefore accommodating various width purlins or rafters. Fix with LUMBERLOK Product Nails 30mm x 3.15mm diameter.
Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304.

*NAILON PLATES
0.91mm G300 Z275 Galvanised Steel
1.55mm G300 Z275 Galvanised Steel
3.0mm Black Steel NZCC - SD ungalvanised
LUMBERLOK Nailon is produced as a flat steel plate with prepunched holes to accommodate LUMBERLOK Product Nails 30mm x 3.15mm diameter. 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, in 40mm increments. (min. 80mm length)
Refer to Characteristic Loadings Brochure for design values.

<table>
<thead>
<tr>
<th>Plate thickness</th>
<th>1.0mm</th>
<th>2.0mm</th>
<th>3.0mm</th>
</tr>
</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.

DIAGONAL CLEAT N21 (LH or RH)
0.91mm G300 Z275 Galvanised Steel
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. Fixed with LUMBERLOK Product Nails 30mm x 3.15mm diameter.
Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304.

* Detailed product sheet available
*I-BEAM HANGERS*

1.15mm G300 Z275 Galvanised Steel

Developed to provide an effective method of fixing timber I-Beams in floor situations, the Face Fix option is suitable for connecting to supporting timber beams, whereas the Top Fix option can be used to fix to supporting steel beams with a timber top plate. Several sizes available to accommodate a wide range of I-Beams. Fixed with 35mm x 3.75mm diameter nails (supplied). Face Fix option also allows for fixing with Type 17-12g x 35mm Hex Head Screws.

*SPLIT HANGERS*

1.55mm G300 Z275 Galvanised Steel

Designed to provide a strong 90 degree connection for larger timber widths and/or double joist/trusses to supporting members. Always used as pairs, Split Hangers are available to depths of 140, 180 and 220mm and are fixed with Type 17-14g x 35mm Hex Head Screws or LUMBERLOK Product Nails 30mm x 3.15mm diameter (dependent on timber member types and load requirements).

*SCREW TIE*

1.2mm NZCC-SD Hot Dip Galvanised Steel

Meets NZS 3604:2011 and AS/NZS 2699.1:2000. This product is used to tie brick veneer to timber framework using a Type 17-12g x 35mm Hex Head 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.

*ORDINARY PILE FIXING*

Stainless Steel Wire Dogs and nails to comply with the fixing of ordinary piles to bearers as per NZS 3604:2011.

* Detailed product sheet available
1.55mm G300 Z275 Galvanised Steel

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. Fixed with LUMBERLOK Product Nails 30mm x 3.15mm diameter and appropriate M12 bolts (not supplied with product). 40x40x5mm washer supplied.

Refer to Characteristic Loadings Brochure for design values.

CONCRETE FIXING CLEATS CF1 & CF2X

1.55mm G300 Z275 Galvanised Steel

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. Fixed with LUMBERLOK Product Nails 30mm x 3.15mm diameter and appropriate M12 bolts (not supplied with product). 40x40x5mm washer supplied.

Refer to Characteristic Loadings Brochure for design values.

MULTIGRIP

0.91mm G300 Z275 Galvanised Steel

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 flanges. 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.

Nominal Rafter Width | 50 | 100
--- | --- | ---
Cleat | CPC40 or CPC40S | CPC80

CPC cleats provide an excellent purlin/rafter fixing in exposed situations, resisting any wind uplift. The cleats can also be used for exposed rafter to ridge beam connections. Fixed with Type 17-14g Hex Head Screws and LUMBERLOK Product Nails 30mm x 3.15mm diameter (not supplied with product).

Available in Stainless Steel 304.

* Detailed product sheet available
*6kN & 12kN STUD TO BOTTOM PLATE FIXINGS

Also referred to as ‘Stud Anchor’ due to being used for stud to top plate fixing, these are a great alternative to the Sheet Brace Straps as they sit within the wall frame. Also an ideal retro fit fixing after lining/cladding is installed. Packs are supplied with two LUMBERLOK CPC80 cleats and the appropriate nails and screws to provide 1 x 12kN or 2 x 6kN fixings.

STUD STRAP
1.0mm G300 Z275 Galvanised Steel

Designed to secure studs to top plate, this pre-bent strap product can be applied to one face only, saving time over alternative fixing methods. In addition, when fixing to the outside of timber stud wall frames, it provides a flat internal surface for plastering. The pre-formed teeth are designed to be applied by blows from a broad face hammer. The 195mm length of strap for fixing to the stud makes this product suitable for double 45mm top plates.

STUD TIE
1.0mm G300 Z275 Galvanised Steel

A fast effective way of securing top and bottom plates to studs. The pre-bent Stud Tie is wrapped over the wall plate and has pre-formed teeth which are hammered into both sides of the stud. Available in 300 & 400mm lengths, the longer option is suitable for double 90 x 45mm top plates.

*FRAMING STUD STIFFENER
1.55mm G300 Z275 Galvanised Steel

Replace the strength lost in 90 x 45mm framing studs as a result of holes being drilled through timber framing for plumbing or vacuum systems ducting. This solution to include holes up to 60mm diameter as per NZS 3604:2011. Fixed to side of stud with 3 rows of 4 x Type 17-14g x 35mm Hex Head Screws (supplied).

*TOP PLATE STIFFENER
1.55mm G300 Z275 Galvanised Steel

Tested to re-strengthen timber top plates where holes have been drilled for the installation of internal vacuum system ducting. This is an alternative solution to NZS 3604:2011 and includes holes up to 60mm diameter. Fixed through the top plate and into the timber packer with 3 rows of 4 x Type 17-14g x 75mm Hex Head Screws (supplied).

* Detailed product sheet available
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 600mm 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 using LUMBERLOK Product Nails 30mm x 3.15mm diameter. Refer to brochure for application data. Available in Stainless Steel 304.

*BOTTOM PLATE FIXING ANCHOR
0.95mm G300 Z450 Galvanised Steel

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. LUMBERLOK Product Nails 30mm x 3.15mm diameter are then applied to secure the frames in position. Alternative to concrete bolts, or the drilling of bottom plates and lifting of frame over cast-in steel rods. Refer to brochure for application data. Available in Stainless Steel 304.

*HEADER BLOCK ANCHOR
1.15mm G250 Z275 Galvanised Steel

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 600mm 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 using LUMBERLOK Product Nails 30mm x 3.15mm diameter. Refer to brochure for application data. Available in Stainless Steel 304.

*12kN RETRO SUBFLOOR

An ideal fixing to be used when the outside face of the bearer is not accessible, such as with relocatable houses to piles. The specially developed Retro Plates are used for connecting pile to bearers to joists and are easily fixed in constricted situations with Type 17-12g x 35mm Hex Head Screws (supplied). Manufactured in both Hot Dip Galvanised and Stainless Steel options to suit the required corrosive environment.

* Detailed product sheet available
**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.

**PRODUCT NAILS**

30mm x 3.15mm diameter F.H. Available in 25kg, 5kg packs and 500g bags. To be used for most products requiring nailing. Also available in Stainless Steel 316.

**SPIRAL ROLLED NAILS**

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

**ANNULAR GROOVED NAILS**

30mm x 3.15mm diameter F.H., 45mm x 3.3mm diameter F.H., 90mm x 4.0mm diameter F.H. Available in Stainless Steel 316.

* Detailed product sheet available

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**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.

**KRACK MATE**

0.85mm G250 Z275 Galvanised Steel

A preformed metal crack inducer for all types of concrete surfaces. Eliminates concrete cutting, 36mm overall width, supplied in 3m lengths. Krack Mate is inserted into wet concrete after screeding stage, flush with surface level. Refer to brochure for application data.

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SCREWS
Type 17-12g x 35mm Hex Head Screws Galvanised, Electro. Galvanised and Stainless Steel.
Type 17-14g x 35mm Hex Head Screws Electro. Galvanised.
Type 17-14g x 75mm Hex Head Screws Electro. Galvanised.
Available in bags of 100.

BLUE SCREW
Specifically developed for use as a purlin and batten fixing. Complies with NZS 3604:2011. This unique 80mm x 10g screw is blue in colour making it easily identifiable.
Available in boxes of 250.
Available from leading Builders Supply Merchants throughout New Zealand
**MATERIAL**
Stainless Steel 304-2B (except Screw Ties and Nails - 316 Grade)

**STANDARDS**
Applicable timber standards are NZS 3603 and NZS 3604:2011 - Section 4 Durability

**DURABILITY**
Due to the variations in end use and in particular the environments in which these products could be used, we are unable to provide a specific durability statement.

In BRANZ opinion BDO 96/10 however, 304 Stainless Steel is not adversely affected by tanalith treatment and performs considerably better than Hot Dipped Galvanised steel.

In situations where the product could collect wind blown salt deposit not regularly rain washed away, the durability of 304 Stainless Steel material may be adversely affected.

It is not recommended that Stainless Steel fixings be painted over as this may cause a tea staining effect.

For these situations connectors must be visually inspected for signs of discolouration and a maintenance schedule adopted as required.

**AVAILABILITY**
Stainless Steel product can be purchased from Builders Supply Merchants or indented through the merchant from our Auckland and Christchurch warehouse.
WIRE DOGS (LH, RH or STAPLE)

Wire Dogs are manufactured as left handed, right handed, and staples, from 4.76mm diameter stainless steel wire. Each has a 95mm shank, and a 35mm leg.

Refer to Characteristic Loadings Brochure for design values.

*SHEET BRACE STRAPS

0.9mm x 25mm Stainless Steel 304-2B

Punched strap available in lengths of 200mm, 300mm, 400mm and 600mm. Fixed with LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter.

Refer to brochure for application data.

CEILING TIES SSCT160 & SSCT200 (LH or RH)

0.9mm Stainless Steel 304-2B

Overall length 160mm and 200mm. Fixed with LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter.

Refer to Characteristic Loadings Brochure for design values.

*NAILON PLATE

0.9mm x 110mm Stainless Steel 304-2B

LUMBERLOK Nailon is produced as a flat stainless steel plate with prepunched holes to accommodate LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter.

Available as a flat plate, cut to required length, in 40mm increments. (min. 80mm length)

Refer to Characteristic Loadings Brochure for design values.

* Detailed product sheet available
**JOIST HANGERS**

0.9mm Stainless Steel 304-2B

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.

All of the above Joist Hanger connections should be fixed using LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter, or Type 17-12g x 35mm Hex Head Stainless Steel Screws.

Refer to Characteristic Loadings Brochure for design values.

**MULTIGRIP**

0.9mm Stainless Steel 304-2B

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 flanges. Fix with LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter.

Refer to Characteristic Loadings Brochure for design values.

**BOTTOM PLATE FIXING ANCHOR**

0.9mm Stainless Steel 304-2B

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. LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter are then applied to secure the frames in position. Alternative to concrete bolts, or the drilling of bottom plates and lifting of frame over cast-in steel rods.

Refer to brochure for application data.

**HEADER BLOCK ANCHOR**

0.9mm Stainless Steel 304-2B

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 600mm 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 using LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter.

Refer to brochure for application data.

* Detailed product sheet available
2. GENERAL

**STRI P BRACE**
0.9mm x 25mm Stainless Steel 304-2B
Strip Brace is supplied in 10m and 30m coils for use as bracing or in short lengths as a jointing material.
Strip Brace provides an ideal bracing system for walls, or roof plane. One crossed pair of strips may be used in each location where a diagonal brace is required. Fix using 5 x LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter at each end.

Stainless Steel tensioners are not available so tension must be provided during installation phase.
Refer to Characteristic Loadings Brochure for design values.

**MULTI-BRACE**
0.9mm x 53mm Stainless Steel 304-2B
This product has been developed for commercial building situations as an alternative to steel rod or timber as a bracing element. Coils are available in lengths of 10m, 15m and 30m, punched to allow easy fixing, using 11 x LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter at each end.

Stainless Steel tensioners are not available so tension must be provided during installation phase.
Refer to Characteristic Loadings Brochure for design values.

**12kN & 6kN PILE FIXINGS**
Both these products comply with NZS 3604:2011 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. Manufactured in stainless steel to suit high corrosive environments. Packs are supplied inclusive of all necessary nails.

12kN Retro Subfloor Fixings and Ordinary Pile Fixings also available in Stainless Steel. Refer to brochure for application data.
CYCLONE TIES SSCT400 & SSCT600
0.9mm Stainless Steel 304-2B

Overall length 400mm and 600mm – Designed specifically for fixing down rafters or purlins in high wind situations. These are produced in straight pre-twisted lengths which are then folded over timber members on-site, therefore accommodating various width purlins or rafters. Fix with LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter.

Refer to Characteristic Loadings Brochure for design values.

*CONCEALED PURLIN CLEATS
SSCPC40, SSCPC80, SSCPC40S
0.9mm Stainless Steel 304-2B

CPC cleats provide an excellent purlin/rafter fixing in exposed situations, resisting any wind uplift. The cleats can also be used for exposed rafter to ridge beam connections. Fixed with Type 17-12g Hex Head Stainless Steel Screws and LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter (not supplied with product).

Refer to Characteristic Loadings Brochure for design values.

DIAGONAL CLEAT SSN21
(LH or RH)
0.9mm Stainless Steel 304-2B

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. Fixed with LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter.

Refer to Characteristic Loadings Brochure for design values.

GIRT PLATE
0.9mm Stainless Steel 304-2B

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 LUMBERLOK Stainless Steel Product Nails 30mm x 3.15mm diameter each face (16/cleat).

* Detailed product sheet available
**SCREW TIE**

Stainless Steel 316

Meets NZS 3604:2011 and AS/NZS 2699.1:2000. This product is used to tie brick veneer to timber framework using a Type 17-12g x 35mm Hex Head Stainless Steel 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.

**PRODUCT NAILS (ANNULAR GROOVED)**

Stainless Steel 316

LUMBERLOK Product Nails 30mm x 3.15mm diameter F.H. (500gm bags)
45mm x 3.3mm diameter F.H. (500gm bags)
90mm x 4.0mm diameter F.H. (1kg bags)

*Detailed product sheet available*

**SCREWS**

Type 17-12g x 35mm Hex Head Stainless Steel Screws. Available in bags of 100.
PRODUCT STATEMENT
FOR
LUMBERLOK® TIMBER CONNECTORS

This document is issued by MiTek New Zealand Limited 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 Limited 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 Product Statement is to be read in conjunction with the MiTek New Zealand Limited 'Alternative Solution for Table 4.1 NZS 3604:2011'.

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 is 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 3604:2011.

GALVANISING
All components are hot dip galvanised to AS/NZS 4680 to 600gm/m².

DESIGN LOADINGS
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 its intended use.

POST AND BEARER BRACKETS

*B138 (Bolts Included)
* Similar also available in stainless steel 304-2B
Refer to brochure

*B135 (Nails & Bolt 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
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.

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

ANGLE BRACKETS (No Gusset)

ANGLE BRACKETS (With Gusset)
**ANGLES**

*Equivalent angles for plate sizes 100 x 100 Refer to brochure*

**BOLT SIZES**

All bolt holes to accommodate M12 Bolts unless noted.

* Similar also available in stainless steel 304-2B
  *B176

**Z & L BEAM SUPPORTS**

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

**POLE BEAM BRACKET**

*B155 POLE BRACE BRACKET

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

*B145 POLE BRACE BRACKET

**POLE CONSTRUCTION DETAILS**

(BOLTS & WASHERS NOT INCLUDED)

Nail hole for temporary fixing to pole.

18.5kN/Bracket

Joint Characteristic 37kN
18.5kN per bracket.

Suggested Splice Detail where required

20mm Ø Stud Bolts
Square Washers 50 x 50 x 5
Not supplied

Joint Characteristic 74kN
18.5kN per bracket.

Square Washer 50 x 50 x 5
20mm Ø Stud Bolt
Not supplied

2/B128 Brackets per side.

180 Ø Pole or 100 sq. Brace.

45° Optimum

50 x 50 x 5 Washers
20mm Ø Stud Bolts
Not supplied

B128 Bracket each side

POLE BRACE BRACKET

50 x 50 x 5 Washers
20mm Ø Stud

50 x 50 x 5 Washers
20mm Ø Stud Bolt
Not supplied

Joint Characteristic 74kN
18.5kN per bracket.

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

*B178
2. GENERAL

- **B307 SCAFFOLD BRACKET**
- **B303 CORNER BRACKET**
- **FENCE STAY BRACKET**
- **BONZA BORER**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB100</td>
<td>100mm Dia.</td>
</tr>
<tr>
<td>BB150</td>
<td>150mm Dia.</td>
</tr>
<tr>
<td>BB200</td>
<td>200mm Dia.</td>
</tr>
<tr>
<td>BB250</td>
<td>250mm Dia.</td>
</tr>
</tbody>
</table>

L.H. Shown

BSB1 (FLAT)
BSB2 (ROUND AS SHOWN)
The BOWMAC Stainless Steel range provides a system of timber fixing brackets for use in highly corrosive or aesthetic environments. The Stainless Steel range supplements the extensive Hot Dip Galvanised range of BOWMAC Brackets.

BOWMAC Stainless Steel Brackets are available from leading Builders Supply Merchants throughout New Zealand.
PRODUCT RANGE
This catalogue details the Stainless Steel range of BOWMAC products. Refer to separate brochure for the Hot Dip Galvanised range of BOWMAC products.

STANDARDS
Applicable timber standards are NZS 3603 and NZS 3604:2011 – Section 4 Durability.

DESIGN LOADING
These can be derived from the allowable bolt loads in timber, using the relevant design code NZS 3603.

DURABILITY
Due to the variations in end use and in particular the environments in which these products could be used, we are unable to provide a specific durability statement.

In BRANZ opinion BDO 96/10 however, 304 Stainless Steel is not adversely affected by tanalith treatment and performs considerably better than Hot Dip Galvanised Steel.

In situations where the product could collect wind blown salt deposit not regularly rain washed away, the appearance of the product may be affected.

It is not recommended that Stainless Steel fixings be painted over as this may cause a tea staining effect.

CUSTOM PRODUCTS
BOWMAC also manufactures custom made products to suit specific requirements, using Hot Dip Galvanised Steel and 304 Stainless Steel. A lead time by discussion is required to allow for manufacture.

AVAILABILITY
Stainless Steel BOWMAC Brackets can be purchased from Builders Supply Merchants or indented through the merchant from our Auckland and Christchurch warehouse.

END USE
The purchaser is responsible for checking the suitability of any component for its intended use.

## STRAPS

<table>
<thead>
<tr>
<th>BS35</th>
<th>BS38</th>
<th>BS45</th>
<th>BS48</th>
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<tbody>
<tr>
<td><img src="image1" alt="Strap BS35 Diagram" /></td>
<td><img src="image2" alt="Strap BS38 Diagram" /></td>
<td><img src="image3" alt="Strap BS45 Diagram" /></td>
<td><img src="image4" alt="Strap BS48 Diagram" /></td>
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</tbody>
</table>

Holes for M12 Bolts

<table>
<thead>
<tr>
<th>BS75</th>
<th>BS78</th>
<th>BS79</th>
<th>BS85</th>
<th>BS88</th>
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<tbody>
<tr>
<td><img src="image5" alt="Strap BS75 Diagram" /></td>
<td><img src="image6" alt="Strap BS78 Diagram" /></td>
<td><img src="image7" alt="Strap BS79 Diagram" /></td>
<td><img src="image8" alt="Strap BS85 Diagram" /></td>
<td><img src="image9" alt="Strap BS88 Diagram" /></td>
</tr>
</tbody>
</table>

Holes for M12 Bolts
**POST AND BEARER BRACKETS**

**BS135**
- M12 Bolt and Nails Included

**BS138**
- 2 – M12 Bolts Included

**BS25**
- M12 Bolt and Nails Included

**POST AND BEARER BRACKETS**

**POLE BRACKET**

**BS28**
- 2 – M12 Bolts Included

**BS197**
- Holes for M12 Bolts

**BS128**
- Holes for M20 Bolts

**Bolts not included unless specified**

**ANGLE BRACKETS**

**BS50**
- All Holes for M12 Bolts

**BS51**
- All Holes for M12 Bolts

**BS55**
- All Holes for M12 Bolts

**BS163**
- All Holes for M12 Bolts
2. GENERAL

**ANGLES**

<table>
<thead>
<tr>
<th>BS175</th>
<th>BS176</th>
<th>BS177</th>
<th>BS108</th>
</tr>
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<tbody>
<tr>
<td><img src="angle1.png" alt="Image" /></td>
<td><img src="angle2.png" alt="Image" /></td>
<td><img src="angle3.png" alt="Image" /></td>
<td><img src="angle4.png" alt="Image" /></td>
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</tbody>
</table>

All Holes for M12 Bolts

**BEAM SUPPORTS**

<table>
<thead>
<tr>
<th>BS109</th>
<th>BS155</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="beam1.png" alt="Image" /></td>
<td><img src="beam2.png" alt="Image" /></td>
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</tbody>
</table>

All Holes for M12 Bolts

**POLE BRACE BRACKET**

<table>
<thead>
<tr>
<th>BS145</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="brace1.png" alt="Image" /></td>
</tr>
</tbody>
</table>

All Holes for M16 Bolts

- 1 – M16 x 30mm Assembly Bolt only supplied
- 2 – M16 x 30mm Assembly Bolt only supplied

**CHARACTERISTIC LOAD TENSION AND COMPRESSION**

- 42 kN
- 30 kN
PRODUCT STATEMENT
FOR
BOWMAC® STRUCTURAL BRACKETS

This document is issued by MiTek New Zealand Limited 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 Limited 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 Product Statement is to be read in conjunction with the MiTek New Zealand Limited ‘Alternative Solution for Table 4.1 NZS 3604:2011’.

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

5. GENERAL

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

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

A SIMPLE ON-SITE GUIDE FOR 3kN, 6kN & 12kN LOADS AS SPECIFIED IN NZS 3604:2011

<table>
<thead>
<tr>
<th>FIXING LOAD</th>
<th>CONNECTION TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3kN</strong></td>
<td></td>
</tr>
<tr>
<td>Top Plate Joint over Stud</td>
<td><img src="image1" alt="Top Plate Joint over Stud" /></td>
</tr>
<tr>
<td>Top Plate Joint</td>
<td><img src="image2" alt="Top Plate Joint" /></td>
</tr>
<tr>
<td>Hip Rafter &amp; Ridge Board Joint</td>
<td><img src="image3" alt="Hip Rafter &amp; Ridge Board Joint" /></td>
</tr>
<tr>
<td>Ceiling Joist to Runner</td>
<td><img src="image4" alt="Ceiling Joist to Runner" /></td>
</tr>
<tr>
<td><strong>6kN</strong></td>
<td></td>
</tr>
<tr>
<td>Joist to Beam</td>
<td><img src="image5" alt="Joist to Beam" /></td>
</tr>
<tr>
<td>Top Plate Joint over Stud</td>
<td><img src="image6" alt="Top Plate Joint over Stud" /></td>
</tr>
<tr>
<td>Top Plate Joint</td>
<td><img src="image7" alt="Top Plate Joint" /></td>
</tr>
<tr>
<td>Rafter</td>
<td><img src="image8" alt="Rafter" /></td>
</tr>
<tr>
<td><strong>12kN</strong></td>
<td></td>
</tr>
<tr>
<td>Brace to Bearer</td>
<td><img src="image9" alt="Brace to Bearer" /></td>
</tr>
<tr>
<td>Bearer Joint over Pile</td>
<td><img src="image10" alt="Bearer Joint over Pile" /></td>
</tr>
<tr>
<td>Bearer Joint over Pile</td>
<td><img src="image11" alt="Bearer Joint over Pile" /></td>
</tr>
</tbody>
</table>

- **Single Tylok 6T5**: Ref. Fig. 8.16 NZS 3604:2011
- **Pair of Tylok 6T10**: Ref. Fig. 10.2 NZS 3604:2011
- **LUMBERLOK Sheet Brace Strap**: Ref. Fig. 10.5 NZS 3604:2011
- **Single CT160 Ceiling Tie fully nailed with 30mm x 3.15 dia. nails**: Ref. Fig. 10.10 NZS 3604:2011
- **Single Tylok 6T5**: Ref. Fig. 8.16 NZS 3604:2011
- **Single Tylok 6T10**: Ref. Fig. 8.16 NZS 3604:2011
- **JH47 x 120 Joist Hanger with 12 x 30mm x 3.15 dia. nails (3 per flange)**: Ref. Fig. 7.7 NZS 3604:2011
- **Single Nailon Plate 1mm x 110 x 160mm with 12 x 30mm x 3.15 dia. nails each side of joint**: Ref. Fig. 6.7 NZS 3604:2011
- **Single Nailon Plate 1mm x 110 x 160mm with 12 x 30mm x 3.15 dia. nails each end & 4 x 100mm skew nails**: Ref. Fig. 6.19 NZS 3604:2011
- **Single Nailon Plate 1mm x 110 x 160mm with 12 x 30mm x 3.15 dia. nails each end & 4 x 100mm skew nails**: Ref. Fig. 6.19 NZS 3604:2011

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TIMBER CHARACTERISTIC STRENGTH
NZS 3603:1993 AMENDMENT 4

Structural Grades (as defined in NZS 3604:2011 Clause 1.3)
Timber properties are for dry in-service conditions m/c = 16%

<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>SG6</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>SG8</td>
<td>14.0</td>
<td>18.0</td>
<td>6.0</td>
<td>3.8*</td>
<td>8.0</td>
<td>5.4</td>
</tr>
<tr>
<td>SG10</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

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>
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<td>150 x 100</td>
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<tr>
<td>250 x 100</td>
<td>240 x 90</td>
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</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 Size then becomes the Call Size. The Actual Size is the size used in the design calculations.
BOWMAC Scaffold Brackets

FOR THE BUILDER

Available from leading Builders Supply Merchants throughout New Zealand

*BSee Reverse Side For IMPORTANT NOTES

BOWMAC Scaffold Brackets are designed for easy attachment to 90 x 45 studs and support scaffold planks to provide a very versatile, strong and safe scaffolding system.

The optional B309 safety rail bracket bolts on to all the scaffold brackets and accommodates two safety rails, providing a complete system.

SAFE LOADS
100kg - 90 x 45 SG8 studs

Nail brackets to studs
with 3 x 100mm x 4 dia. nails as shown

Detail ‘A’

B307 BRACKET LEFT OR RIGHT HAND
(R.H. SHOWN)

Detail ‘B’

Nail brackets to studs with 3 x 100mm x 4 dia. nails as shown

Pack behind stud (if required)

B303 CORNER BRACKET
*Important (Please Read)

IMPORTANT NOTES

- Maximum stud height for bracket use - 2.4m.
- Maximum load per bracket - 100kg (1 kN)
- Stud centres must not exceed 600mm for bracket use.
- Maximum bracket centres - 2.4m along wall.
- Timber planks to be fixed onto brackets by nailing up through holes provided into each plank.
- Horizontal bracing of scaffolding system can be achieved by nailing LUMBERLOK Strip Brace to underside of outer plank and return to intermediate timber stud (see below)

Planks

2.4 metres max.

LUMBERLOK Strip Brace
fixed to stud and plank

Fix planks to brackets as shown

Fix bracket to studs as shown using
3 x 100mm x 4 dia. nails

2.4m max.

600 crs. max.
### DURABILITY - PRODUCT SELECTION

#### ALTERNATIVE SOLUTION FOR TABLE 4.1 NZS 3604:2011

<table>
<thead>
<tr>
<th>Zones</th>
<th>Fixings</th>
<th>Environment</th>
<th>Product Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Zones</td>
<td>Nail plates and timber connectors</td>
<td>Closed</td>
<td>GANG-NAIL and LUMBERLOK Standard Zinc Coated Product&lt;sup&gt;(1)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>All other structural fixings</td>
<td></td>
<td>BOWMAC Hot Dip Galvanised&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Zone D</td>
<td>Structural fixings</td>
<td>Sheltered and Exposed</td>
<td>LUMBERLOK Stainless Steel 304&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BOWMAC Stainless Steel 304&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Zones B and C</td>
<td>Timber pile fixings MORE than 600mm from ground</td>
<td>Sheltered Subfloors vented 7000 mm&lt;sup&gt;2&lt;/sup&gt;/m&lt;sup&gt;2&lt;/sup&gt; or less</td>
<td>LUMBERLOK Hot Dip Galvanised&lt;sup&gt;(4)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BOWMAC Hot Dip Galvanised&lt;sup&gt;(4)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exposed Subfloors vented 7000 mm&lt;sup&gt;2&lt;/sup&gt;/m&lt;sup&gt;2&lt;/sup&gt; or more</td>
<td>LUMBERLOK Stainless Steel 304&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BOWMAC Hot Dip Galvanised&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Timber pile fixings LESS than 600mm from ground</td>
<td>Sheltered and Exposed</td>
<td>LUMBERLOK Stainless Steel 304&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>All other structural fixings</td>
<td>Sheltered</td>
<td>LUMBERLOK Hot Dip Galvanised&lt;sup&gt;(4)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BOWMAC Hot Dip Galvanised&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exposed</td>
<td>LUMBERLOK Stainless Steel 304&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BOWMAC Hot Dip Galvanised&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1. All GANG-NAIL, LUMBERLOK and BOWMAC product complies with Table 4.2 NZS 3604:2011.
2. LUMBERLOK and BOWMAC Stainless Steel product is 304 grade. Regular washing and maintenance will positively affect long term appearance of these items.
3. BOWMAC Hot Dip Galvanised product is to AS/NZS 4680 to 600g/m<sup>2</sup>.
4. LUMBERLOK Hot Dip Galvanised product is to AS/NZS 4680 to 390g/m<sup>2</sup>.

**NOTES**

Items above refer to GANG-NAIL®, LUMBERLOK® and BOWMAC® product marketed for specific applications with a requirement to last 50 years as an alternative solution to Table 4.1 NZS 3604:2011.

The MiTek New Zealand Limited Durability Flow Chart for product selection is derived from this alternative solution to Table 4.1 NZS 3604:2011. Definitions of zones and environments are derived from NZS 3604:2011.

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.
Product statements January 2012 for LUMBERLOK and BOWMAC products.

Content from NZS 3604:2011 Table 4.1 adapted by MiTek New Zealand Limited with permission from Standards New Zealand under Copyright Licence 000907. Please see Standard for full details, available from www.standards.co.nz.
4. DURABILITY

CLOSED
Dry, internal location, not subject to airborne salts or rain wetting.

SHELTERED
Open to airborne salts, but not rain washed.

EXPOSED
Open to airborne salts and rain washed.
4. DURABILITY

DURABILITY FLOW CHART

ZONE

- Zones B and C
  Refer NZS 3604:2011
  Fig. 4.2

- Zones D
  Refer NZS 3604:2011
  Fig. 4.2

ENVIRONMENT

- Closed

TREATMENT

- GANG-NAIL / LUMBERLOK
  Standard Zinc Coated
  Steel Product

- LUMBERLOK / BOWMAC
  Type 304
  Stainless Steel Product

- BOWMAC
  Hot Dip Galvanised
  Steel Product

- LUMBERLOK
  Hot Dip Galvanised
  Steel Product

- LUMBERLOK
  Type 304
  Stainless Steel Product

- LUMBERLOK
  Type 304
  Stainless Steel Product

Product Key

- Standard Zinc Coated Steel Product
- Hot Dip Galvanised Steel Product
- Type 304 Stainless Steel Product

Sheltered and Exposed

Fixings ABOVE 600mm from ground level for piles and poles

Fixings BELOW 600mm from ground level for piles and poles

For structural timber fixings specifically external decks

Post base supports beam / post / strap refer NZS 3604 Sect. 9
NOTE: Zone D includes all offshore islands, the area within 500m of the coastline of New Zealand, and those areas shown in white. The map shall be read in conjunction with 4.2.2 NZS 3604:2011.
NOTE: Zone D includes all offshore islands, the area within 500m of the coastline of New Zealand, and those areas shown in white. The map shall be read in conjunction with 4.2.2 NZS 3604:2011.

Copyright Standards New Zealand 2011. Content from NZS 3604:2011 Section 4 has been reproduced by MiTek New Zealand Limited with permission from Standards New Zealand under Copyright Licence 000907. Please see Standard for full details, available from www.standards.co.nz.
ORDINARY PILE FIXING

- Complies with NZS 3604:2011
- All Fixings Stainless Steel
- For all Ordinary Piles (Refer Figure 6.3 NZS 3604:2011)

2 x 90mm Stainless Steel Skew Nails into Pile

2 x Stainless Steel Wire Dogs (1 per side)

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

Code: OPF
Pack Contains:
- 20 x Stainless Steel Wire Dog Staples
- 20 x Stainless Steel Nails 90mm x 4 dia.

Available from leading Builders Supply Merchants throughout New Zealand
6kN PILE FIXING
FOR CANTILEVER PILES

- 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 3604:2011
- 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**

CT160 CLEATS H.D.G. OR ST. STEEL
(4 PER PILE)
3 NAILS INTO BEARER AND JOIST

2 x 90mm H.D.G. OR ST. STEEL (H.C.)
NAILS SKEW DRIVEN

Nail Free Area
Typical

4 x 90mm STAINLESS STEEL
NAILS SKEW DRIVEN
2 UP INTO THE BEARER
2 DOWN INTO THE PILE

6kN PACK OPTIONS

<table>
<thead>
<tr>
<th>NOTE!!</th>
<th>PRODUCT FINISH OPTIONS</th>
</tr>
</thead>
</table>
| MEDIUM CORROSION PACK (6kN M.C.) | - Pile to Bearer Wire Dogs & Nails STAINLESS STEEL  
- Joist to Bearer Cleats & Nails HOT DIP GALVANISED |
| HIGH CORROSION PACK (6kN H.C.) | - Pile to Bearer Wire Dogs & Nails STAINLESS STEEL  
- Joist to Bearer Cleats & Nails STAINLESS STEEL |

See Over For Corrosion Table.
**6kN Joint Fixing Schedule**

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

**6kN Pile Set Contents**
Each set represents 1 x 6kN Pile Fixing (packed 10 sets per carton)
- 4 x Wire Dog Staples Stainless Steel
- 4 x CT160 Cleats
- 24 x 45mm x 3.55 dia. Spiral Nails
- 90mm St. Steel Nails to suit 4 - M.C. pack
- 8 - H.C. pack

Refer front page for Product Finish Options

**CORROSION HAZARD USE TABLE**

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Zones B &amp; C</td>
<td>- If Joist to Bearer Fixings ABOVE 600mm from Ground level</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High Corrosion Pack (6kN HC)</th>
<th>All items Stainless Steel (304).</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Zone D</td>
<td>- All Fixings BELOW 600mm from Ground level</td>
</tr>
</tbody>
</table>

**External Bracing Line**

- Bearer located centrally on Pile

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

**90mm H.D.G. Nails not included.**
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 3604:2011
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
Sample Subfloor Elevations

12kN Fixing - Pile to Bearer
- Joists to Bearer

12kN Joint Fixing Schedule

<table>
<thead>
<tr>
<th>PILE TO BEARER</th>
<th>JOIST TO BEARER</th>
<th>NAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Nailon Plate (2 per joint) 1mm x 160mm (Typical)</td>
<td>- CT160 Cleats (4 per Joist) 160mm long</td>
<td>- 80 x 45mm x 3.55 dia. Spiral Nails</td>
</tr>
<tr>
<td>- 8 Nails per Plate into Pile</td>
<td>- 3 Nails per Cleat into Joist</td>
<td>- 6 x 90mm x 4 dia. St. Steel Nails (H.C. Pack only)</td>
</tr>
<tr>
<td>- 8 Nails per Plate into Bearer</td>
<td>- 3 Nails per Cleat into Bearer</td>
<td>- 2 Skew Nails 90mm (1 per side)</td>
</tr>
<tr>
<td>- 2 Skew Nails 90mm (1 per face)</td>
<td>- CT160 Cleats (4 per Joist) 160mm long</td>
<td>- 80 x 45mm x 3.55 dia. Spiral Nails</td>
</tr>
</tbody>
</table>

12kN Fixings - Pile to Bearer

12kN Fixings - Joists to Bearer

12kN Pile Set Contents
- Each set represents 1 x 12kN Pile Fixing (packed 4 sets per carton)
- 2 x Nailon Plates 160mm long
- 8 x CT160 Cleats
- 80 x 45mm x 3.55 dia. Spiral Nails
- 90mm x 4 dia. St. Steel Angular Groove
- 6 - H.C. Pack

Refer front page for Product Finish Options

90mm H.D.G. 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.

Hot Dip Galvanised or Stainless Steel options available for required corrosive zone.

Code: 12KNRF
Material: 0.91mm G300 Z275 (Hot Dip Galvanised Steel)

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 Screws

Code: 12KNRFH
Material: 0.9mm Stainless Steel 304-2B
12kN BEARER SPLICE OVER PILE
AS PER CLAUSE 6.12.7 NZS 3604:2011

Available from leading Builders Supply Merchants throughout New Zealand

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

4 x 100mm x 3.75 dia. skew nails
OR 2 x 90mm x 4 dia. skew nails and 2 x Stainless Steel Wire Dogs fixed diagonally opposite (ex Ordinary Pile Fixing Pack)
On-site splicing of trusses

12kN Brace Pile Connection

Folded Nailon Cleats

Full strength joint splice

High tension load fixing

Available from leading Builders Supply Merchants throughout New Zealand

USE STAINLESS STEEL OPTION IN EXTERIOR SITUATIONS
Nailon is manufactured from steel coil and is available in 1mm, 2mm and 3mm nominal thicknesses of widths shown. LUMBERLOK Nailon is a very versatile steel plate with many applications in timber construction, providing a very strong jointing system. Nailon is easily applied by filling the pre-punched holes with LUMBERLOK Product Nails 30mm x 3.15mm dia.

Flat Nailon Plate can be used for splicing trusses and beams, or as a moment joint when a pair of plates are used. 3mm Nailon can also be welded to form special brackets supporting portal frames, trusses etc.

Nailon Plate Dimensions

Nailon is available in 0.9mm x 110mm Stainless Steel 304-2B.

Specification

1.0mm x 110mm mild steel 0.91mm G300 Z275 Galvanised Steel
2.0mm x 113mm mild steel 1.55mm G300 Z275 Galvanised Steel
3.0mm x 130mm or 240mm mild steel NZCC-SD ungalvanised
1.0mm and 2.0mm Nailon is zinc coated prior to punching. 3.0mm Nailon is generally supplied ungalvanised, however all Nailon is available hot dipped galvanised on request.

Nailon is available in 0.9mm x 110mm Stainless Steel 304-2B.

Nails

1.0mm and 2.0mm Nailon, 20 nails per 100mm plate length.
3.0mm Nailon 130mm wide, 27 nails per 100mm plate length.
3.0mm Nailon 240mm wide, 50 nails per 100mm plate length.

Stainless Steel nails are also available.

Loadings

<table>
<thead>
<tr>
<th>Nail Load</th>
<th>Characteristic Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>30mm x 3.15 dia.</td>
<td>1.0 kN/Nail</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plate Load</th>
<th>Characteristic Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1mm Plate Tension</td>
<td>244 N/mm per plate</td>
</tr>
<tr>
<td>1mm Plate Shear</td>
<td>157 N/mm per plate</td>
</tr>
<tr>
<td>2mm Plate Tension</td>
<td>415 N/mm per plate</td>
</tr>
<tr>
<td>2mm Plate Shear</td>
<td>270 N/mm per plate</td>
</tr>
<tr>
<td>3mm Plate Tension</td>
<td>425 N/mm per plate</td>
</tr>
<tr>
<td>3mm Plate Shear</td>
<td>283 N/mm per plate</td>
</tr>
</tbody>
</table>

Availability

As many Nailon requirements are not stock items, a lead time is sometimes required when ordering. Flat Nailon Plate can be cut to any length, in multiples of 40mm, or in coil form. All folded and special Nailon products are made to order. Order your Nailon requirements through your local LUMBERLOK merchant. Orders directed to us will be charged via your local merchant.

Order to Specify

1. LUMBERLOK Nailon Plate - thickness, width and length in 40mm increments. (min. 80mm length)
2. Special requirements, preferably accompanied by a sketch.
3. Quantity.
4. Nail quantity required.
6kN FLOOR JOIST SPLICE OVER BEARER
AS PER CLAUSE 7.1.1.7(c) NZS 3604:2011

2 x Tylok 6T5
OR 2 x Strap Nails
(1 each side of joist)

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 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.

### 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 Stainless Steel 304-2B.

### Loadings

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

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

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

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

**Joist Hanger to suit 75mm thick (nominal) timber**

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

**Joist Hanger to suit 100mm thick (nominal) timber**

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

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

### IMPORTANT NOTE

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

<table>
<thead>
<tr>
<th>Joist Hanger Type</th>
<th>No. of Nails per Flange*</th>
<th>Down Uplift</th>
<th>No. of Screws per Flange*</th>
<th>Down Uplift</th>
</tr>
</thead>
<tbody>
<tr>
<td>JH 47 x 90</td>
<td>3</td>
<td>9.0 kN</td>
<td>6.0 kN</td>
<td>7.0 kN</td>
</tr>
<tr>
<td>JH 47 x 120</td>
<td>5</td>
<td>15.0 kN</td>
<td>10.0 kN</td>
<td>14.0 kN</td>
</tr>
<tr>
<td>JH 47 x 190</td>
<td>9</td>
<td>27.0 kN</td>
<td>18.0 kN</td>
<td>21.0 kN</td>
</tr>
<tr>
<td>JH 95 x 165</td>
<td>8</td>
<td>24.0 kN</td>
<td>16.0 kN</td>
<td>21.0 kN</td>
</tr>
<tr>
<td>JH 70 x 180</td>
<td>8</td>
<td>24.0 kN</td>
<td>16.0 kN</td>
<td>21.0 kN</td>
</tr>
</tbody>
</table>

Nail with LUMBERLOK Product Nails 30mm x 3.15 dia. Fix with Type 17-12g x 35mm Hex Head Screws

* 4 Flanges per hanger

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

**Material:** 0.91mm G300 Z275 Galvanised Steel or 0.9mm 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 1.8 kN Point Load & 0.4 kPa Dead Load)

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

★ Floor Joist centres up to 600mm.
★ These charts cover SG6, SG8 & SG10 timber grades.
★ The same selection of 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>
The I-Beam Hanger Face Fix has been developed to provide an effective method of fixing timber I-Beams to supporting timber beams in floor situations.

1. Fix I-Beam Hanger with 35mm x 3.75 dia. galvanised nails to face of supporting beam through small holes (4mm dia.). Alternatively use Type 17-12g x 35mm screws in the larger holes (6mm dia.). Refer to table for quantity of nails/screws required.

2. Fix bottom I-Beam flange using 2 x 35mm x 3.75 dia. galvanised nails. Select one dimple each side of the I-Beam which will allow a 35mm long nail to be driven fully home at a 45° angle.

### Loadings

<table>
<thead>
<tr>
<th>Hanger Type</th>
<th>No. of Nails per flange</th>
<th>Nails</th>
<th>No. of Screws per flange</th>
<th>Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBHF24055</td>
<td>5</td>
<td>12.0 kN</td>
<td>3</td>
<td>18.0 kN</td>
</tr>
<tr>
<td>IBHF24065</td>
<td>5</td>
<td>12.0 kN</td>
<td>3</td>
<td>18.0 kN</td>
</tr>
<tr>
<td>IBHF24090</td>
<td>5</td>
<td>12.0 kN</td>
<td>3</td>
<td>18.0 kN</td>
</tr>
<tr>
<td>IBHF30065</td>
<td>6</td>
<td>14.4 kN</td>
<td>4</td>
<td>24.0 kN*</td>
</tr>
<tr>
<td>IBHF30090</td>
<td>6</td>
<td>14.4 kN</td>
<td>4</td>
<td>24.0 kN*</td>
</tr>
<tr>
<td>IBHF36065</td>
<td>7</td>
<td>16.8 kN</td>
<td>5</td>
<td>24.0 kN*</td>
</tr>
<tr>
<td>IBHF36090</td>
<td>7</td>
<td>16.8 kN</td>
<td>5</td>
<td>24.0 kN*</td>
</tr>
<tr>
<td>IBHF40090</td>
<td>8</td>
<td>19.2 kN</td>
<td>6</td>
<td>24.0 kN*</td>
</tr>
</tbody>
</table>

Nails - 35mm x 3.75 dia. or Screws - Type 17-12g x 35mm Hex Head
Additional 2 nails are required for fixing to bottom flange.

*Maximum hanger load.

Characteristic Strengths have been derived from tests in accordance with NZS 3603:1993

Characteristic nail load = 1.2 kN/nail
Characteristic screw load = 3.0 kN/screw

**Definition:** Example IBHF30065

- IBHF = Face Fix
- 300 = Height (A)
- 65 = Width (B)

**Material:** 1.15 G300 Z275 Galvanised Steel

(Top Fixing of I-Beams on reverse side)
The I-Beam Hanger Top Fix has been developed to provide an effective method of fixing timber I-Beams to supporting steel beams in floor situations.

1. Fix I-Beam Hanger to top of timber plate with 6 x 35mm x 3.75 dia. galvanised nails.

2. Fix bottom I-Beam flange using 2 x 35mm x 3.75 dia. galvanised nails. Select one dimple each side of the I-Beam which will allow a 35mm long nail to be driven fully home at a 45° angle.

### Loadings

<table>
<thead>
<tr>
<th>Hanger Type</th>
<th>No. of Nails</th>
<th>Characteristic Loads (Down)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBHT24055</td>
<td>6</td>
<td>13.8 kN</td>
</tr>
<tr>
<td>IBHT24065</td>
<td>6</td>
<td>13.8 kN</td>
</tr>
<tr>
<td>IBHT24090</td>
<td>6</td>
<td>13.8 kN</td>
</tr>
<tr>
<td>IBHT30065</td>
<td>6</td>
<td>13.8 kN</td>
</tr>
<tr>
<td>IBHT30090</td>
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</tr>
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</tr>
<tr>
<td>IBHT40090</td>
<td>6</td>
<td>13.8 kN</td>
</tr>
</tbody>
</table>

Nails - 35mm x 3.75 dia.

Additional 2 nails are required for fixing to bottom flange.

**Definition:** Example IBHT30065

IBHT = Top Fix
300 = Height (A)
65 = Width (B)

**Material:** 1.15 G300 Z275 Galvanised Steel

Characteristic Strengths have been derived from tests in accordance with NZS 3603:1993 (Face Fixing of I-Beams on reverse side)
SPLIT HANGERS

For larger timber widths or double member connections
Available in heights of 140, 180 and 220mm
Always used in pairs

*Split Hangers are available in heights of:
  - SPH140 - 140mm
  - SPH180 - 180mm
  - SPH220 - 220mm

Characteristics and Loadings

<table>
<thead>
<tr>
<th>Hanger Type</th>
<th>No. of Nails per Flange</th>
<th>Down (kN)</th>
<th>Uplift (kN)</th>
<th>No. of Screws per Flange</th>
<th>Down (kN)</th>
<th>Uplift (kN)</th>
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<td>SPH220</td>
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<td>24.0</td>
<td>5</td>
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<td>30.0</td>
</tr>
</tbody>
</table>

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

Material: 1.55 G300 Z275 Galvanised Steel

Available from leading Builders Supply Merchants throughout New Zealand
**Complies with NZBC Acceptable Solution B1/AS2**

**Fixings comply with 50 year durability Section 4 NZS 3604:2011**

**Assumed deck loadings of max. 2.0 kPa**

**Tested to AS/NZS 1170:2002 Horizontal load 0.75 kN/m at top rail**

1000mm max. above decking

5 x M12 Bolts with square washers

2/ 140 x 45mm Joists min.

BOWMAC B48 Hot Dip Galvanised Bracket installed as shown. (Use BS48 Stainless Steel version within Zone D)

Max. 6mm slot to accommodate B48 Bracket
★ Covers floor thickening and supporting stud requirements.
★ Covers floor slabs on buildings complying with NZS 3604:2011.
★ All concrete slabs to be constructed as per NZS 3604:2011.
★ Thickening requirements apply to reinforced floor slabs.
★ Provides solutions for stud requirements where point loads exceed 10 kN.
★ All slabs assumed to be supported on soils that have Ultimate Bearing Capacity of 300 kPa ($\phi = 0.50$).
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 give concentrated loads and a run of two or more trusses with the same loads will give a UDL.

2. Establish the maximum load value via the MiTek 20/20® Truss Design Software by using the Truss Bearings Exceeding 10 kN 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 10 kN, FP1 and FS1 for up to 20 kN, or FP2 and FS2 for up to 30 kN.

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 10 kN (uplift), refer to MiTek for Special Design.

MiTek 20/20® Example Selection

TRUSS BEARINGS EXCEEDING 10 kN REPORT

<table>
<thead>
<tr>
<th>Critical Trusses</th>
<th>Qty</th>
<th>Span (mm)</th>
<th>Joint</th>
<th>Bearing Reactions (kN)</th>
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</thead>
<tbody>
<tr>
<td>GT01</td>
<td>1</td>
<td>8000</td>
<td>J</td>
<td>16.177 Down, 7.292 Uplift</td>
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</table>

Girder truss GT01
Maximum down value = -16.177 kN
375 x 375 Square pad as per detail FP1
2 Studs required under truss

SINGLE STUD OPTION

Top plate arrangement as per NZS 3604:2011
Truss can be located anywhere on the top plate

MULTIPLE STUD OPTION

Max. 50mm tolerance for truss location
Top plate arrangement as per NZS 3604:2011
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).

<table>
<thead>
<tr>
<th>TRUSS BEARING REACTION</th>
<th>SLAB THICKENING DETAIL</th>
<th>STUD REQUIREMENTS</th>
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<tbody>
<tr>
<td></td>
<td>CONCENTRATED LOAD</td>
<td>UNIFORM DIST. LOAD</td>
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<td>Bearing reaction up to &amp; including 10 kN</td>
<td>STANDARD reinforced slab floor as per NZS 3604:2011</td>
<td>2400</td>
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<td></td>
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<td>3000</td>
</tr>
<tr>
<td>Bearing reaction up to &amp; including 20 kN</td>
<td>TYPE FP1</td>
<td>TYPE FS1</td>
</tr>
<tr>
<td></td>
<td>375 x 375 PAD</td>
<td>300 STRIP THICKENING</td>
</tr>
<tr>
<td></td>
<td>2400</td>
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<tr>
<td></td>
<td>2700</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>3</td>
</tr>
<tr>
<td>Bearing reaction up to &amp; including 30 kN</td>
<td>TYPE FP2</td>
<td>TYPE FS2</td>
</tr>
<tr>
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<td>450 x 450 PAD</td>
<td>450 STRIP THICKENING</td>
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<tr>
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<td>2700</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>4</td>
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</table>

STUD REQUIREMENTS

<table>
<thead>
<tr>
<th>STUD HEIGHT</th>
<th>NO. OF STUD UNDER TRUSS</th>
<th>MIN. TIMBER SIZE</th>
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<tr>
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<td>90 x 45</td>
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</table>

CONTINUOUS CONCRETE THICKENING OPTIONS
(for uniformly distributed loads)

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<tr>
<th>STUD HEIGHT</th>
<th>NO. OF STUD UNDER TRUSS</th>
<th>MIN. TIMBER SIZE</th>
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</thead>
<tbody>
<tr>
<td>2400</td>
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<td>3</td>
<td>90 x 45</td>
</tr>
<tr>
<td>3000</td>
<td>4</td>
<td>90 x 45</td>
</tr>
</tbody>
</table>

CONCRETE PAD OPTIONS
(for concentrated loads)

- Standard 100mm reinforced slab floor as per NZS 3604:2011
- Standard 100mm reinforced slab floor as per NZS 3604:2011

Timber properties based on NZS 3603:1993 Amendment No.4 March 2005. Minimum grade specified is SG8 unless otherwise noted.
For SG6 use the studs for the next highest category.
- For loads up to 10 kN select studs from the 20 kN table.
- For loads up to 20 kN select studs from the 30 kN table.
- For loads above 20 kN Special Design is required.

* Note: The stud requirement for 20 kN & 30 kN bearing reactions can be applied to external walls as well.
Retro Fitted Load Bearing Option

Note:
- Covers slab details where no thickening has been built into the foundation.
- For loads exceeding 10 kN install bottom lintel (300 x 100) between two adjacent studs as detailed below. For loads 30 kN 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

- TRUSS BEARING LOAD
- Studs as per table on page 3
- LUMBERLOK CPC80 each side
- 6 x 90mm nails through studs into bottom lintel at each end
- 2 / 300 x 50 or 1 / 300 x 100 SG8 bottom lintel. Nail as standard pre-cut details

Uniformly Distributed Loads

- TRUSSES LOADING ON TO TOP PLATE UNIFORMLY (locations indicative only)
- Internal load bearing wall
- Number of studs shown indicative only
- LUMBERLOK CPC80 each stud
- 6 x 90mm nails through studs into bottom lintel at each end
- 2 / 300 x 50 or 1 / 300 x 100 SG8 bottom lintel. Nail as standard pre-cut details
BOTTOM PLATE FIXING ANCHOR

★ Eliminates the drilling of bottom plates
★ Makes the fixing of timber framework easier and quicker
★ Saves hand trowelling around cast-in anchor bolts or rods
★ Use at 900mm centres max.
★ Complies with Clause 7.5.12.2 NZS 3604:2011

1. Bottom Plate Fixing Anchors shall be fixed at 900mm centres max. to the boxing for concrete floor slabs, over a continuous vapour barrier.
   Each Fixing Anchor is nailed prior to concrete pour, and shall be left undisturbed until concrete has hardened ready for timber frames to be installed. (Fig. 1).
2. When timber framing is in place, the Fixing Anchors are folded up and over the bottom plate. (Fig. 2).
3. Two LUMBERLOK Product Nails 30mm x 3.15 dia. shall 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.

4. A 75mm x 4 dia. concrete 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 used as a Bracing Wall hold-down, a Fixing Anchor must be positioned within 150mm from the end of that wall. Bracing wall must not exceed 70 BU/m.

Available from leading Builders Supply Merchants throughout New Zealand
7kN
Out of Plane
Horizontal

Characteristic Load

8kN
Vertical

7kN
In the Plane
Horizontal

BRICK VENEER

Code: BPA
Material: 0.95mm G300 Z450 Galvanised Steel

Material: 0.9mm Stainless Steel 304-2B
Packaged: 50 per carton

CAVITY CLADDING

Design Loads
Concrete compressive strength 20 MPa min.
HEADER BLOCK ANCHOR

★ For use with concrete header block foundations
★ Eliminates the drilling of bottom plates
★ No need to use Anchor Bolts
★ Use at 600mm crs. max.
★ Complies with Clause 7.5.12.2 NZS 3604:2011

1. Header Block Anchors shall be fixed at 600mm centres max. 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 concrete pour and shall be left undisturbed until the concrete has hardened sufficiently to locate and position the timber frames.

2. Prior to placing timber frames, 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
3. 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).

4. A 75mm x 4 dia. concrete nail must be fixed adjacent to each Header Block Anchor, through the bottom plate into the concrete, at not less than 70mm from the concrete edge. When used as a Bracing Wall hold-down, a Header Block Anchor must be positioned within 150mm from the end of that wall. Bracing wall must not exceed 70 BU/m.

5. 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 the product is fixed around the inside face of the bottom plate.

**Code:** HBA  
**Material:** 1.15mm G250 Z275 Galvanised Steel  
**Code:** SSHBA  
**Material:** 0.9mm Stainless Steel 304-2B  
**Packaged:** 48 per carton  
**Design Loads**  
Concrete compressive strength 17 MPa min.
KRACK MATE

- Finish concrete floors the same day
- No need to saw cut concrete surface saving time and additional expense
- Provides a continuous surface appearance
- Available in convenient 3m lengths
- Provides controlled concrete cracking

KRACK MATE

A preformed metal crack inducer for all types of concrete surfaces is inserted into wet concrete after screeding stage, flush with surface level.

Available from leading Builders Supply Merchants throughout New Zealand
Krack Mate

Available in 3.0m lengths which can be bent and snapped to the required length on site, to suit the width of concrete being laid. Alternatively KRACK MATE lengths can be lapped against each other for continuous crack induced locations over greater areas.

Installation

Once the concrete has been screeded and is still relatively wet, KRACK MATE can be installed at predetermined locations by placing the product vertically into the concrete surface. With a series of gentle push/pull movements, the product will slowly immerse itself into the concrete just below, or at surface level.

Advantages

- Designed for on-ground slabs and can be butted up to any given edge ie. columns, pilasters and kerbing.
- Allows the concrete to crack along the KRACK MATE whilst it cures.
- Profile makes KRACK MATE almost impossible to dislodge therefore surface can be floated as normal to obtain a flat continuous surface.
- KRACK MATE provides a positive alternative to existing methods and saw cut options.
- KRACK MATE insures no cutting of mesh enabling the continuity of mesh and and rebar to be utilised to their maximum strength.

Material

0.85mm G250 Z275 Galvanised Steel
36mm o/a width
Supplied in 3.0m lengths
★ For plumbing or vacuum systems ducting through walls
★ Reinforces 90 x 45mm timber studs back to FULL STRENGTH!
★ Solution to include holes up to 60mm diameter
★ Refer Clause 8.5.1.6 NZS 3604:2011
Note:
Use Stud Stiffener as template for drilling 60mm hole.

Fix to side of stud with 3 rows of 4 x Type 17-14g x 35mm Hex Head Screws (supplied).

Centre of hole must be a minimum of 100mm from nog location.

Maximum stud length 2400mm overall

Maximum hole size 60mm dia.

Code: FSS
Material: 1.55mm G300 Z275 Galvanised Steel
Packed: 8 x Framing Stud Stiffeners per Carton
100 x Type 17-14g x 35mm Hex Head Galvanised Screws
**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 3604:2011 for nailing schedule to resist horizontal loads.
- These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- All fixings assume bottom plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- Wall framing arrangements under girder trusses are not covered in this schedule.
- All timber selections are as per NZS 3604:2011.

**DEFINITIONS**

- **Lintel span dimension point**
- **Top plate**
- **Lintel clearance**
- **Trimmer studs (Number of studs indicative only)**
- **Jack stud**
- **Lintel depth**
- **Lintel drop**
- **Sill or Header trimmer**
- **Lintel Supporting Girder Trusses:**

### Roof Supporting Girder Trusses:

<table>
<thead>
<tr>
<th>Roof Tributary Area</th>
<th>Light Roof</th>
<th>Heavy Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wind Zone</td>
<td>Wind Zone</td>
</tr>
<tr>
<td></td>
<td>L, M, H</td>
<td>L, M, H</td>
</tr>
<tr>
<td>8.6 m²</td>
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<tr>
<td>34.3 m²</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notes:**

1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
2) Assumed girder truss is at mid-span or middle third span of lintel
3) Use similar fixings for both ends of lintel
4) All other cases require specific engineering design

### Selection Chart for Lintel Fixing

<table>
<thead>
<tr>
<th>Lintel Span</th>
<th>Loaded Dimension (See Fig. 1.3 NZS 3604:2011)</th>
<th>Light Roof</th>
<th>Heavy Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L, M, H, VH, EH</td>
<td>L, M, H, VH, EH</td>
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<td>G</td>
<td>H</td>
</tr>
<tr>
<td>5.0</td>
<td>G</td>
<td>H</td>
<td>-</td>
</tr>
<tr>
<td>6.0</td>
<td>G</td>
<td>H</td>
<td>-</td>
</tr>
<tr>
<td>4.5</td>
<td>2.0</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>3.0</td>
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<td>5.0</td>
<td>G</td>
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<td>-</td>
</tr>
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<td>6.0</td>
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<td>H</td>
<td>-</td>
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<td>5.0</td>
<td>G</td>
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</tr>
<tr>
<td>6.0</td>
<td>G</td>
<td>H</td>
<td>-</td>
</tr>
</tbody>
</table>

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**LINTEL FIXING OPTIONS**

### TYPE E
**1.4 kN**

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

### TYPE F
**4.0 kN**

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

### TYPE G
**7.5 kN**

- 6 x 90mm x 3.15 dia. nails
- 400mm Sheet Brace Strap to one side
- 2 x 90mm x 3.15 dia. nails directly below lintel (typical)

### TYPE H
**13.5 kN**

- 8 x 90mm x 3.15 dia. nails
- 400mm Sheet Brace Strap to both sides
- 90mm x 3.15 dia. nails @ 250mm crs. both sides (typical)

**Or**

- 6 x 90mm x 3.15 dia. nails each end
- 90mm x 3.15 dia. nails directly below lintel at 250mm crs.

**Or**

- 2 x Tylok 2T4 to one side

**Or**

- 2 x Tylok for Radiata Pine

**Or**

- 2 x Strap Nail for Douglas Fir

**Or**

- 2 x 6kN Stud Anchor (CPC80)

**Or**

- 400mm Sheet Brace Strap wrap around bottom plate and up the other side

**Or**

- 2 x 400mm Sheet Brace Strap to one side

**Or**

- 2 x Tylok 2T4 both sides

**Or**

- Proprietary screw bolt

**Or**

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

**8. WALLS**
6kN STUD TO BOTTOM PLATE FIXING

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

For Concrete Floor Slabs

Stud

8 x Product Nails
30mm x 3.15 dia.

4 x Type 17-14g x 35mm Screws

Bottom Plate

M12 Bolt

CPC80 Cleat

100mm max.

30mm

Inside Wall Face

Code: SBP
Material: CPC80 1.55mm 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

For Concrete Floor Slabs

Material: CPC80 1.55mm 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
Panel hold-down bracket for use in specified GIB Ezy Brace® 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
- 2 x BOWMAC screw bolts included within specific GIB HandiBrac® pack

GIB® Bracing Elements

The GIB HandiBrac® is a proprietary product that has been tested and is suitable for use with specified GIB Ezy Brace® systems.

Fixing to Timber Framed Floors

BOWMAC screw bolt or a 150mm by 12mm diameter galvanised coach screw (with a characteristic uplift strength of 12kN).

Fixing to Concrete Slabs

BOWMAC screw bolt or an alternative proprietary fixing with a characteristic uplift strength of 15kN
Panel Hold-down Details

**Concrete Floor - Internal Wall**
The bottom plate at both ends of the bracing element is fixed using a fastener with a proprietary fixing with a minimum characteristic uplift strength of 15 kN. If included in pack see overleaf instruction to install BOWMAC screw bolt.

Locate the GIB HandiBrac® bracket centrally on the stud

**Concrete Floor - External Wall**
The bottom plate at both ends of the bracing element is fixed using a fastener with a proprietary fixing with a minimum characteristic uplift strength of 15 kN. If included in pack see overleaf instruction to install BOWMAC screw bolt.

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 BOWMAC screw bolt (if supplied) or a 150mm by 12mm diameter galvanised coach screw (with a characteristic uplift strength of 12kN). For BOWMAC screw bolt installations see overleaf.

Locate the GIB HandiBrac® bracket centrally on the stud

**Timber Floor - External Wall**
Bottom Plate is fixed using a BOWMAC screw bolt (if supplied) or a 150mm by 12mm diameter galvanised coach screw (with a characteristic uplift strength of 12kN). For BOWMAC screw bolt installations see overleaf.

Locate the GIB HandiBrac® bracket such that the coach screw/BOWMAC screw bolt is centred over the joist or bearer below
Installation of BOWMAC screw bolt (if included in pack)

Suitable for use in timber or masonry base material and achieves the minimum uplift strength

- Use a 10 mm diameter masonry bit for a solid concrete substrate and an 8 mm diameter drill bit for fixing to a timber sub-floor.
- Drill a hole into the base material to depth 8 mm deeper than the required embedment and clean out the hole of dust and debris prior to installation of the BOWMAC screw bolt.
- Insert the bolt through the GIB HandiBrac® plate and bracket and into the hole.
- Begin tightening the bolt by applying forward pressure when engaging the first thread.
- Additional forward pressure may be required for installation in high strength, dense base materials.
- Continue tightening the anchor until the head is firmly seated against the GIB HandiBrac® plate.
- In extremely dense material, use of an impact wrench is recommended.
- Be sure the bolt is at the required embedment depth.
- Don’t exceed the maximum clamping torque of 80Nm.
- The installation is now complete.

Installation Tips:
- Use quality hexagonal socket with a ratchet spanner
- Where substrate allows, a torque controlled wrench can be used
- During installation debris or dust created by the thread cutting action may cause some resistance to be experienced. This is easily overcome by unscrewing the BOWMAC screw bolt for one turn, or more and then continue to fix to the full embedment.

GIB HandiBrac® is manufactured and distributed by:
MiTek New Zealand Ltd
Auckland Office:
40 Neales Rd, East Tamaki, Manukau 2013, New Zealand
P O Box 58-014, Botany, Auckland 2163, New Zealand
Ph: 64-9-274 7109, Fax: 64-9-274 7100
Christchurch Office:
14 Pilkington Way, Wigram, Christchurch 8042, New Zealand
P O Box 8387, Riccarton, New Zealand
Ph: 64-3-348 8691, Fax: 64-3-348 0314
Internet Site: www.miteknz.co.nz

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

The name GIB®, GIB HandiBrac® and the shield device are registered trademarks of Fletcher Building Holdings Limited.

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**LUMBERLOK®**

**SHEET BRACE STRAPS**

- Complies with Section 8 NZS 3604:2011
- 6 kN and 12 kN fixings
- 200, 300, 400 and 600mm lengths
- Quick and easy to apply

**Timber Floor**

- **External Wall**
  - 300mm Sheet Brace Strap
  - 6 Nails to Stud
  - 3/6 Nails to Joist
  - 3/6 Nails to Bottom Plate

- **Internal Wall**
  - 300mm Sheet Brace Strap
  - 6 Nails to Stud
  - 3 Nails to Bottom Plate
  - 6 Nails to Nog

- **Concrete Floor**
  - 2/300mm Sheet Brace Straps
  - 6 Nails to Stud
  - 3/3 Nails to Bottom Plate
  - 6 Nails to Nog

LUMBERLOK Sheet Brace Straps are available in 200, 300, 400 and 600mm lengths. In addition to a bracing wall hold down, this product can be used for a multitude of 6 kN fixing situations, as detailed in NZS 3604:2011. 0.91mm x 25mm G300 Z275 Galvanised Steel. Nail using LUMBERLOK Product Nails 30mm x 3.15 diameter. 

Also available in 0.9mm x 25mm Stainless Steel 304-2B.

**Available from leading Builders Supply Merchants throughout New Zealand**
TOP PLATE JOINTING
AS PER CLAUSE 8.7.3 NZS 3604:2011

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
Alternative solution to NZS 3604:2011

For internal vacuum systems ducting
Reinforces the top plate back to FULL STRENGTH!
Alternative solution to Figure 8.20 NZS 3604:2011
Fix up into top plate and into packer with 3 rows of 4 x Type 17-14g x 75mm Hex Head Screws (supplied). It may be advisable to drill pilot hole for each screw to assist installation.

Max. hole size 60mm dia.

100mm minimum
102mm maximum

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

Code: TPS
Material: 1.55mm G300 Z275 Galvanised Steel
Packed: 8 x Top Plate Stiffeners per Carton
100 x Type 17-14g x 75mm Hex Head Galvanised Screws
NOTE:
★ All fixings are designed to resist vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
★ These assumptions are the correct choice of rafter/truss to top plate connections have been made.
★ Gable end wall top plate/stud connections where the adjacent rafter/truss is located within 1200mm of gable end wall with a maximum verge overhang of 750mm, requires fixing type A as shown below.
★ 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 3604:2011.

LOADED DIMENSION DEFINITION

FIXING OPTIONS

FIXING TYPE A
0.7 kN
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.

FIXING TYPE B
4.7 kN
CHOOSE ANY OF THE 3 OPTIONS BELOW

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

RECOMMENDED FOR INTERNAL WAll OPTIONS TO AVOID LINING ISSUES

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

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

Wind Zones L, M, VH, EH, as per NZS 3604:2011

Note:
To calculate the number of B type fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.
NOTE:
Fix the Stud Saver to the adjacent stud with 30mm x 2.5 dia. clouts at 300mm crs. and 1/30mm x 2.5 dia. clout to each dwang/nog and plate.

- Eliminates studs and blocks at wall intersections and corners.
- Easy location of internal walls.
- Repositioning of internal walls can be done without modifying the frame.
- Can be fitted easily and quickly on site before lining.
- Wall board linings are attached by use of standard self-tapping screws.
- Wall bracing performance can be achieved when fixed according to the standard plaster board fixing details. (BRANZ test report dated 5 May 1999)
- Reduces plaster board cracking in corners.
- Supplied in lengths to suit 2400 & 2700mm wall heights.
STUD SAVER
FOR SOFFIT & EXTERIOR CLADDING SUPPORT

Material: 0.75mm x 67mm G250 Z275 Galvanised Steel
Medium duty (EM) classification
Tested by BRANZ in accordance with AS/NZS 2699.1:2000
BRANZ test report No. ST0725 November 2007
Suitable for both ‘dry bedding’ and encapsulated mortar
Hot Dip Galvanised ties for Zones B & C, and Stainless Steel Grade 316 ties for Zone D meet NZS 3604:2011 Sect. 4 Durability
Available in 85mm and 105mm sizes

Available from leading Builders Supply Merchants throughout New Zealand
All brick work must be constructed in accordance with NZS 4210:2001 Masonry Construction: Materials and Workmanship. Screw Ties must be applied accordingly and are not to be hammered into timber framing.

- Water shedding shoulder prevents transfer of the moisture from tie to building.
- Nail hole for Oamaru Stone.
- Angled neck encourages increased tie embedment in mortar.

Material: 1.2mm NZCC-SD Hot Dip Galvanised Steel
Screws: Type 17-12g x 35mm Hex Head Hot Dip Galvanised Screws
Packaging: 250 ties per box including screws

Also available in Stainless Steel Grade 316 for Zone D.
Producer Statement - PS1 - Design

ISSUED BY: MiTek New Zealand Limited

TO BE SUPPLIED TO: Building Consent Authorities in New Zealand


AT: Various Locations in New Zealand

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

On behalf of MiTek New Zealand Limited

Date: January 2012

In Ling Ng
Technical Services Manager
BE (Hons), CPEng, IntPE
MIPENZ (ID: 146585)
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.
- Dead load includes weight of trusses, purlins, associated framing and roofing material.
- Wind zones as defined by NZS 3604:2011.
- Earthquake zones 1, 2, 3 or 4 as per NZS 3604:2011.
- Snow loads - ALL designs up to 1.0 kPa Snow load unless otherwise noted.
- Soil conditions - ALL foundations to be into natural good ground with a minimum ultimate bearing capacity of 300 kPa.
- Refer to MiTek New Zealand Limited for any design modifications required for increase in snow loads or wind loads above those stated on the drawings.

DESIGN REFERENCES
NZS 3603:1993
AS/NZS 1170:2002
NZS 3604:2011

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 Limited BOWMAC® products and the performance of the buildings is reliant on the correct choice of product.

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**POST & BEARER BRACKETS**

**BRACKET RANGE**
- B12, B14, B16, B18, B25, B28, B75, B78, B79, B132, B133, B134, B135, B138, B195, B196, B197 and B198*
  (*holes for M10 Bolt)

**典型用途**

1. **Saddle**
   - 螺栓仅
   - 25mm
   - 150mm min. embedment
   - 150mm min. embedment
   - 50mm
   - 50mm
   - Min. edge distance for bracket stem

2. **Rag Strap**
   - 25mm
   - 150mm min. embedment
   - 75mm min.
   - 50mm
   - 50mm
   - Min. edge distance for bracket stem

3. **Pipe Insert**
   - M10 bolt
   - 25mm
   - 150mm min. embedment
   - Hole size for pipe, allow 1mm clearance max.
   - 50mm
   - 50mm
   - Min. edge distance for bracket stem

**浇筑混凝土**
- 17.5 MPa

**安装说明**
- 所有螺栓孔除非特别注明，均容纳M12螺栓。
- 钉孔可容纳40mm x 3.15mm宽头方形镀锌螺钉。热镀镀锌。

**ON-SITE FITTED DIMENSIONS**
EXAMPLE AREAS
- Tributary roof area on connection ‘C1’ = (S/2 + O/H) x (B/2 + O/H)
- Tributary roof area on connection ‘C2’ = (S/2 + O/H) x B

LAYOUT & LOAD DIMENSIONS

BRACKET TYPE
- **Type 1**: B14, B134 and B198
- **Type 2**: B12, B18, B25, B28, B132, B133, B135, B138, B195 and B196
- **Type 3**: B16, B75, B78, B79 and B197

* Refer to NZS 3604:2011 for specific roof weights.

Concrete volumes for roof area beyond 12m² can be increased on a pro-rata basis.

LOAD TABLE

MAX. CONCRETE FOOTING VOLUME TABLE

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

Minimum concrete strength 17 MPa

Minimum concrete strength 17 MPa

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

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

12mm Coach screws (110mm min. penetration)

FIXING NOTE

- All bolt holes accommodate M12 Bolt unless noted.

TYPICAL USE

Beam

Bracket

90x90mm Post

12mm Dynabolt (Shank size 10mm)

Poured concrete 17 MPa
**Example Areas**

- Tributary roof area on connection ‘C1’ = \((S/2 + O/H)x(B/2 + O/H)\)
- Tributary roof area on connection ‘C2’ = \((S/2 + O/H)xB\)

**LAYOUT & LOAD DIMENSIONS**

<table>
<thead>
<tr>
<th>Roof type</th>
<th>Wind zone</th>
<th>Max. Roof Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>Extra high</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>12</td>
</tr>
<tr>
<td>Heavy</td>
<td>Extra high</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Medium/Low</td>
<td>12</td>
</tr>
</tbody>
</table>

* Refer to NZS 3604:2011 for specific roof weights.

Concrete volumes for roof area beyond 12 m² can be increased on a pro-rata basis.

**Load Table**

<table>
<thead>
<tr>
<th>Roof type</th>
<th>Wind zone</th>
<th>Volume of footing concrete (m³) for area of roof supported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extra high</td>
<td>1 m²</td>
</tr>
<tr>
<td>Light</td>
<td>0.09</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>0.07</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>0.05</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Heavy</td>
<td>Extra high</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>0.03</td>
</tr>
</tbody>
</table>

* No securement for uplift required

**Max. Concrete Footing Volume Table**

**Building with Bowmac®**

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[91]
BRACKET RANGE

- B163 and B165

FIXING NOTE

- All bolt holes accommodate M12 Bolt unless noted.

TYPICAL USE

Bracket Spacing
Dimension 'S'

SEATING LOAD

- Bracket designed to carry live load of 3.0 kPa.

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
- B175, B176, B177 and B178* (*holes for M16 Bolt)

TYPICAL USE

LAYOUT & LOAD DIMENSIONS

<table>
<thead>
<tr>
<th>Roof type</th>
<th>Wind zone</th>
<th>Max. Roof Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1.0 kPa Snow</td>
</tr>
<tr>
<td>Light</td>
<td>Extra high</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>High</td>
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<tr>
<td></td>
<td>Medium</td>
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<td></td>
<td>Low</td>
<td>7</td>
</tr>
<tr>
<td>Heavy</td>
<td>Extra high</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Medium/Low</td>
<td>5</td>
</tr>
</tbody>
</table>

Max. design Snow Load S = 1.0 kPa

LOAD TABLE
STRAP, T & L BRACKETS

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

**TYPICAL USE**

- B35, B38
  - 90x90mm Post
  - Beam joint over Post
  - 50mm min. 70mm max.

- B45, B48
  - 90x90mm Post

- B85, B88
  - 90x90mm Post

**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.

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

- Tributary roof area on connection ‘C1’ = \((S/2 + O/H)(B/2 + O/H)\)
- Tributary roof area on connection ‘C2’ = \((S/2 + O/H)\times B\)

DESIGN NOTE:

- The loads shown in the table are vertical in direction and principally upwards, i.e. wind loads.
- Design assumes brackets are on both sides of joints.

LOAD TABLE

<table>
<thead>
<tr>
<th>Roof type</th>
<th>Wind zone</th>
<th>Max. Roof Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light*</td>
<td>Extra high</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>12</td>
</tr>
<tr>
<td>Heavy*</td>
<td>Extra high</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Medium/Low</td>
<td>12</td>
</tr>
</tbody>
</table>
Suitable for single tread sizes up to 300mm wide or 2 x 140mm wide

Quick and easy to install

No need to rebate tread to stringer

Hot Dip Galvanised - for external use

---

**Code:** B65200F  
**Material:** ex 3mm thick plate 65 x 200mm (folded) Hot Dipped Galvanised
Suitable for 2 x 140mm stair treads wide

Enables two steps to perform as one

Stiffens and strengthens individual stair treads

Hot Dip Galvanised - for external use

Symetrically place on underside of treads as shown and screw fix with 8 screws total.
Screws: Type 17-12g x 35mm Galvanised. (SC3512DG)

Code: B65200
Material: ex 3mm thick plate 65 x 200mm Hot Dipped Galvanised
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 Timber Framed Buildings or the MiTek® 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 MiTek® 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**

- Truncated Girder
- Ridge Line
- Standard Truss
- Jack Truss

**Semi Gable**

- Truncated Girder
- Ridge Line
- Standard Truss
- Jack Truss

**Gable**

- Gable End Truss
- Ridge Line
- Verge Trimming
- Standard Truss

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

**T Shaped**

- Gable End Truss
- Standard Truss
- Ridge Line
- Girder Truss
- Valley Truss
- Verge Trimming

**L Shape**

- Standard Truss
- Truncated Girder
- Ridge Line
- Girder Truss
- Valley Truss
- Verge Trimming

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

The load bearing frames should be checked for:

1. Lintel sizes suitable for truss loading. Consult NZS 3604, the GANGLAM Beam Manual, the MiTek® 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

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.

Figure 5

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 Extra High
Snow (Sg): Up to 1.0 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 3604:2011
• MiTek New Zealand Limited design software
MiTek 20/20®
NOTE:

★ All purlin and batten sizes are as per NZS 3604:2011.
★ All fixings assume that the purlin and battens are installed on their flat over the top of the rafter or truss.
★ The minimum fixing requirements apply to all purlin locations within the roof area.
★ The LUMBERLOK BLUE SCREW where specified requires a minimum of 30mm penetration into rafter or truss i.e. it is suitable for rough sawn timber up to 50mm thick at 18% moisture content.

**SELECTION CHART FIXING OPTIONS**

(minimum fixing requirements)

<table>
<thead>
<tr>
<th>ROOF WEIGHT</th>
<th>MAX. PURLIN SPAN (mm)</th>
<th>MAX. PURLIN CRS. (mm)</th>
<th>WIND ZONE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>HEAVY ROOF Tile Battens</td>
<td>900</td>
<td>370</td>
<td>A</td>
</tr>
<tr>
<td>LIGHT ROOF Tile Battens</td>
<td>900</td>
<td>370</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>370</td>
<td>A</td>
</tr>
<tr>
<td>LIGHT ROOF Purlins</td>
<td>900</td>
<td>900</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>900</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>1200</td>
<td>C</td>
</tr>
</tbody>
</table>

Wind Zone:

As per NZS 3604:2011

L = Low Wind
M = Medium Wind
H = High Wind
VH = Very High Wind
EH = Extra High Wind
**STANDARD FIXING OPTIONS**

**FIXING TYPE A**
0.55kN
1 NAIL
Note: Two nails maybe preferred to prevent batten rolling over with high roof pitches.

**FIXING TYPE B**
0.8kN
2 NAILS

**FIXING TYPE C**
2.4kN
1 BLUE SCREW

**FIXING TYPE D**
3.45kN
2 BLUE SCREWS
OR
2 SKEW NAILS plus 2 WIRE DOGS (for purlin on edge)

**FIXING TYPE E**
5.5kN
2 NAILS plus 1 CT200
OR
1 PAIR of CPC40

**FIXING DEFINITIONS**

**NAIL** = Either 90mm x 3.15 dia. power-driven nail or 100mm x 3.75 dia. hand-driven nail

**BLUE SCREW** = 80mm x 10 gauge LUMBERLOK BLUE SCREW

**WIRE DOG** = LUMBERLOK WIRE DOG either LH or RH

**CT200** = LUMBERLOK Ceiling Tie CT200 bend over purlin, 4 x LUMBERLOK Product Nails 30mm x 3.15 dia. each end

**CPC40** = LUMBERLOK CPC40 with 2 x Type 17-14g x 35mm Hex Head Screws per flange

**FIXING TOLERANCES**

**LUMBERLOK BLUE SCREW**

**PURLIN / BATTEN SPLICE**

**FIXING OPTIONS**

**FIXING TYPE A & B OVER PURLIN SPLICE**

1 nail in each

**NOTES:**
Skew nail when fixing to 35mm rafter or truss

**FIXING TYPE C, D or E OVER PURLIN SPLICE**

90 x 35mm block fixed to chord or rafter with 4 x 75mm nails

• **TYPE C**
1 SCREW to each purlin

• **TYPE D & E**
1 NAIL plus 1 SCREW to each purlin

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

1 BLUE SCREW

11 15

15
9kN TRUSS TO TOP PLATE FIXING

★ Complies with Table 10.15 NZS 3604:2011
★ Top mounted fixing allows additional face fixing if required

4 x Product Nails 30mm x 3.15 dia.
per CPC40 Cleat

2 x Type 17-14g x 75mm Screws
per CPC40 Cleat

Code: 9KNTTP
Material: CPC40 1.55mm 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 10.15 NZS 3604:2011
★ Top mounted fixing allows additional face fixing if required

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

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

CPC80 Cleats both sides

Top Plate Packer

Top Plate

Rafter/Truss

16kN

Code: 16KNTTP
Material: CPC80 1.55mm 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

Available from leading Builders Supply Merchants throughout New Zealand

USE STAINLESS STEEL OPTION 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**

<table>
<thead>
<tr>
<th></th>
<th>CPC40S (short)</th>
<th>CPC40</th>
<th>CPC80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rafter Width (nominal)</td>
<td>50mm</td>
<td>50mm</td>
<td>100mm</td>
</tr>
<tr>
<td>3 x LUMBERLOK Product Nails</td>
<td>40mm</td>
<td>40mm</td>
<td>80mm</td>
</tr>
<tr>
<td>2 x Screws</td>
<td>28mm</td>
<td>28mm</td>
<td>28mm</td>
</tr>
<tr>
<td>14g x 75mm Screws to Bottom Flange</td>
<td>25mm</td>
<td>25mm</td>
<td>25mm</td>
</tr>
</tbody>
</table>

**Uplift Direction**

<table>
<thead>
<tr>
<th>Characteristic Load</th>
<th>CPC40S</th>
<th>CPC40</th>
<th>CPC80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fix as shown with-</td>
<td>5 kN/pair</td>
<td>8 kN/pair</td>
<td>16 kN/pair</td>
</tr>
<tr>
<td>LUMBERLOK Product Nails 30mm x 3.15 dia.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 17-14g x 35mm Hex Head Galvanised Screws *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: Stainless Steel CPC use Type 17-12g x 35mm Hex Head Stainless Steel Screws</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FIXINGS:**

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

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

*Note: with ceiling material use Type 17-14g x 75mm Screws

**MATERIAL:**

1.55mm G300 Z275 Galvanised Steel or 0.9mm Stainless Steel 304-2B

SCREWS AND NAILS NOT INCLUDED WITH PRODUCT

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Covers roof bracing requirements to resist horizontal loads as set out in NZS 3604:2011 Section 10.

A definitive guide to the description and installation of Roof Plane Braces and Roof Space Braces.

### Roof Bracing Requirements

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Light Roof</th>
<th>Heavy Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One roof brace per 50m² of roof area (see rule 8 for minimum requirements).</td>
<td>One roof brace per 25m² of roof area (see rule 8 for minimum requirements).</td>
</tr>
</tbody>
</table>

### Roof Bracing - Rules & Definitions

1. The bracing described in this brochure covers both framed roofs and fully trussed roofs.
2. Roof planes less than 6m² (e.g., dormers & porches) do not require bracing.
3. Roof braces can consist of either i) Roof Plane Brace or ii) Roof Space Brace or combination of the two.
4. Roof braces are not required on roofs where sarking is installed as per NZS 3604:2011 Clause 10.4.4 or where a ceiling diaphragm is installed and is attached to the rafters.
5. Roof area is the actual plan area of the roof and includes overhangs.
6. A hip or valley rafter running continuously from ridge to top plate can be classed as one roof plane brace.
7. A pair of crossed 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. There must be at least one roof plane brace in each roof plane. Each ridge line shall have a minimum of two roof braces.
9. Every design effort should be made to distribute the roof braces as evenly as possible over the entire roof area and run alternately in opposite directions.
Roof Bracing Options

i) ROOF PLANE BRACE

Each roof plane brace can be:

- A hip or valley rafter running continuously from ridge to the top plate in accordance with NZS 3604:2011 Clauses 10.2.1.3.2 or 10.2.1.3.3

  OR

- A pair of tensioned and crossed LUMBERLOK Strip Brace running continuously from ridge to top plate installed as detailed below.

(A) Less than 2m long.

(B) More than 2m long (Max. 4.8m).

(C) Not directly under the ridge - less than 2m long.

(D) Not directly under the ridge - more than 2m long.

* Not required when a ceiling diaphragm complying with Clause 13.5 of NZS 3604:2011 is used.

ii) ROOF SPACE BRACE

A pair of tensioned and crossed LUMBERLOK Strip Brace over top chords/rafters installed @ 45° ± 5° to the rafter or purlin line.

When purlin depth above truss chord is 50mm or less, Strip Brace can be installed over top of purlins. Fix with 1 x 30mm x 3.15 dia. nail at the purlin closest to the rafter/truss crossing.
MULTI-BRACE

★ Commercial and Industrial Roof/Wall Bracing
★ Economically comparable to Steel Rod or Timber Bracing systems
★ Quick and easy to apply

Available from leading Builders Supply Merchants throughout New Zealand
**Loadings**

- 35mm Optimum*  

3 nails top edge, 8 nails vertical face (not in same line)

<table>
<thead>
<tr>
<th>Loadings</th>
<th>0.91mm x 53mm G300 Z275 GALVANISED STEEL</th>
<th>0.9mm x 53mm STAINLESS STEEL 304-2B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension</td>
<td>Multi-Brace Only</td>
<td>Multi-Brace With Tensioner *</td>
</tr>
<tr>
<td>Characteristic Load</td>
<td>14.8 kN</td>
<td>14.8 kN*</td>
</tr>
<tr>
<td>Elongation</td>
<td>0.2mm/m/kN including nail slip</td>
<td></td>
</tr>
<tr>
<td>End nail fixing</td>
<td>-11 x LUMBERLOK Product Nails 30mm x 3.15 dia.</td>
<td></td>
</tr>
</tbody>
</table>

**Tensioner**  
Use tensioner to ensure Multi-Brace is taut prior to roof fixing.  
*Note: Not available in Stainless Steel so tension must be provided during installation phase.

**Availability**  
Multi-Brace is available in 10m, 15m and 30m coil lengths which may be ordered through your local LUMBERLOK merchant. (Special lengths available on request.)
GABLE END BRACING
OVER ROOF SECTION OF END WALLS

- Covers bracing of the roof section on gable end construction.
- Includes bracing on extra high gables.
- All timber to be minimum grade SG8 as defined in NZS 3604:2011 apart from gable end webs which are either SG6 or SG8 (see Tables 1A & 1B).
- Tables cover gable end truss installed as single component 45mm thick, double component 90mm thick, 45x70mm or 45x90mm webs on flat.
- Design assumes restraints are provided at the ceiling and roof lines.
- Bracing covers loading conditions as per NZS 3604:2011 up to Extra High wind and includes full height brick veneer gables.
TABLE 1A - STRONGBACK LOCATION FOR WEBS @ 600MM CRS.

<table>
<thead>
<tr>
<th>WIND ZONE</th>
<th>70x45 Web</th>
<th>90x45 Web</th>
<th>Double Component Gable End Webs</th>
<th>45x70 on flat</th>
<th>45x90 on flat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG6</td>
<td>SG6</td>
<td>2/ 70x45 2/ 90x45</td>
<td>SG6</td>
<td>SG6</td>
</tr>
<tr>
<td>LOW</td>
<td>1800</td>
<td>2000</td>
<td>2000</td>
<td>2300</td>
<td>2550</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>1650</td>
<td>1800</td>
<td>2000</td>
<td>2100</td>
<td>2250</td>
</tr>
<tr>
<td>HIGH</td>
<td>1450</td>
<td>1600</td>
<td>1750</td>
<td>1850</td>
<td>2050</td>
</tr>
<tr>
<td>VERY HIGH</td>
<td>1300</td>
<td>1500</td>
<td>1600</td>
<td>1700</td>
<td>1850</td>
</tr>
<tr>
<td>EXTRA</td>
<td>1150</td>
<td>1350</td>
<td>1500</td>
<td>1600</td>
<td>1750</td>
</tr>
</tbody>
</table>

*Use these values for full height brick veneer attached to gable end. Please note that the maximum height of brick veneer on a gable end wall is 5.5m.

TABLE 1B - STRONGBACK LOCATION FOR WEBS @ 400MM CRS.

<table>
<thead>
<tr>
<th>WIND ZONE</th>
<th>70x45 Web</th>
<th>90x45 Web</th>
<th>Double Component Gable End Webs</th>
<th>45x70 on flat</th>
<th>45x90 on flat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG6</td>
<td>SG6</td>
<td>2/ 70x45 2/ 90x45</td>
<td>SG6</td>
<td>SG6</td>
</tr>
<tr>
<td>LOW</td>
<td>2100</td>
<td>2300</td>
<td>2250</td>
<td>2650</td>
<td>2900</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>1900</td>
<td>2100</td>
<td>2050</td>
<td>2400</td>
<td>2650</td>
</tr>
<tr>
<td>HIGH</td>
<td>1700</td>
<td>1850</td>
<td>1850</td>
<td>2100</td>
<td>2350</td>
</tr>
<tr>
<td>VERY HIGH</td>
<td>1550</td>
<td>1700</td>
<td>1700</td>
<td>1950</td>
<td>2150</td>
</tr>
<tr>
<td>EXTRA</td>
<td>1400</td>
<td>1550</td>
<td>1500</td>
<td>1550</td>
<td>2000</td>
</tr>
</tbody>
</table>

SELECTION PROCESS

- Where (a) is less than or equal to (h) - no strongback required.
- Where (a) is greater than (h) but less than 2(h) - lower strongback is required.
- Locate the strongback at height of (a/2).
- Where (a) is greater than 2(h) but less than 3(h) - lower and upper strongbacks are required.
- Locate strongbacks at height increments of (a/3).

STRONGBACK OPTIONS

- 90x45 on edge
  - Fix to each truss web with 2/ LUMBERLOK Blue Screws

- 140x45 on edge
  - Fix to each truss web with 2/ LUMBERLOK Blue Screws
  - For double component webs fix with LUMBERLOK CPC40 with 2 /14g screws per flange

- 90x45 on flat
  - Fix each truss web with 2/ LUMBERLOK Blue Screws

- 90x45 on flat plus 90x45 on edge
  - Fix with 90mm nails @150mm crs.

TABLE 2 - STRONGBACK SPAN AND GABLE BRACE LOCATION

<table>
<thead>
<tr>
<th>OPTION 1</th>
<th>OPTION 2</th>
<th>OPTION 3</th>
<th>OPTION 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>90x45 on edge</td>
<td>140x45 on edge</td>
<td>90x45 on flat</td>
<td>90x45 on flat plus 90x45 on edge</td>
</tr>
<tr>
<td>Max. span and/or gable brace location 1200mm</td>
<td>Max. span and/or gable brace location 1400mm</td>
<td>Max. span and/or gable brace location 1600mm</td>
<td>Max. span and/or gable brace location 2000mm</td>
</tr>
</tbody>
</table>
DOUBLE STRONGBACK DETAILS FOR ALL GABLE END OPTIONS

(full height brick veneer option shown)

- Indicate gable brace location as per Table 2
- Upper strongback span maximum 2000mm using strongback Option 4
- Dashed line indicates 90x45 on flat where strongback Option 4 is used
- Gable brace as per page 4
- Upper brace (if required 2/ 90x45, max. length 5m. Nail together with 90mm nails @ 250mm crs.)
- 2/ 90x45mm runner as required for upper brace
- Fixings (required on all webs) as per Strongback Options on page 2
- Indicates gable brace location as per Table 2
- Truss web
- Gable end truss
- Strongback as per Table 2

SINGLE STRONGBACK DETAILS

- LUMBERLOK CPC80 fixed with 4/ 14g screws per flange for strongback Option 3 & 4
- 5/ LUMBERLOK Blue Screws for strongback Option 1 & 2
- Dashed line indicates 90x45 on flat where strongback Option 4 is used
- a/2
- a
- a/2
- a/3
- a/3
- a/3
- a/3

10. ROOF FRAMING
Full height brick veneer - Max. height 5.5m on gable end wall

Note: Double component gable end truss or 45x90 webs on flat required for full height brick veneer gable

Stud wall as per NZS 3604:2011

CROSS SECTION
(full height brick veneer option shown)

LUMBERLOK CPC80 fixed with 4/14g screws per flange at each gable brace connection to strongback

Gable brace 90x45 up to 2m long, 2/90x45 above 2m long. See Table 2 for spacing

2/90mm skew nails plus a pair of LUMBERLOK Sheet Brace Straps 200mm fixed with 6/30 x 3.15mm nails each end

GABLE BRACE DETAIL FOR ALL GABLE END OPTIONS
(full height brick veneer option shown)
GABLE END RAKING VERGE
OVERHANG OPTIONS

★ Covers raking verge using standard purlin overhang options.
★ Covers up to 750mm overhang using standard verge outriggers.
★ Covers up to 1200mm overhang using verge outrigger/purlin combination.
OVERHANG OPTIONS

- All gable end loading parameters are based on the design considerations used in NZS 3604:2011 and covers heavy roof weight, extra high wind load and snow load Sg of up to 1.0 kPa.
- All live load considerations as per AS/NZS 1170.
- All timber to be minimum grade SG8 as defined in NZS 3604:2011.

CANTILEVER PURLIN OPTION

![Cantilever Purlin Option Diagram]

TABLE 1

<table>
<thead>
<tr>
<th>PURLIN SIZE &amp; ORIENTATION</th>
<th>MAX. CANTILEVER LENGTH (mm)</th>
<th>PURLIN CENTRES (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45x45</td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>70x45</td>
<td>300</td>
<td>900</td>
</tr>
<tr>
<td>90x45</td>
<td>450</td>
<td>900</td>
</tr>
</tbody>
</table>

CANTILEVER OUTRIGGER OPTION

(Note: Maximum sidewall overhang of 750mm)

(See details on page 3)

TABLE 2

<table>
<thead>
<tr>
<th>PURLIN SIZE &amp; ORIENTATION</th>
<th>MAX. CANTILEVER LENGTH (mm)</th>
<th>OUTRIGGER CENTRES (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70x45</td>
<td>750</td>
<td>600</td>
</tr>
<tr>
<td>70x45</td>
<td>600</td>
<td>900</td>
</tr>
<tr>
<td>90x45</td>
<td>750</td>
<td>900</td>
</tr>
<tr>
<td>90x45</td>
<td>600</td>
<td>1200</td>
</tr>
</tbody>
</table>

CANTILEVER OUTRIGGER/PURLIN COMBINATION OPTION

(Note: Maximum sidewall overhang of 1200mm)

(See details on page 4)

TABLE 3

<table>
<thead>
<tr>
<th>PURLIN SIZE &amp; ORIENTATION</th>
<th>MAX. CANTILEVER LENGTH (mm)</th>
<th>OUTRIGGER CENTRES (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45x45 Purlin</td>
<td>1200</td>
<td>450</td>
</tr>
<tr>
<td>90x45 Outrigger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70x45 Purlin</td>
<td>1200</td>
<td>700</td>
</tr>
<tr>
<td>90x45 Outrigger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90x45 Purlin</td>
<td>1200</td>
<td>900</td>
</tr>
<tr>
<td>90x45 Outrigger</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CONSTRUCTION DETAILS FOR CANTILEVER OUTRIGGER OPTION

(SPANS & CENTRES AS TABLE 2 ON PAGE 2)

Intermediate block to support purlin where purlin/batten required within overhang section.

Fix each end with 3/ 90mm nails

90x45 back block fixed to truss/rafter overhang and fly rafter with 1/ LUMBERLOK CPC80 fixed with 4/ 14g screws per flange each end

Max. overhang 750mm

Intermediate block to support purlin where purlin/batten required within overhang section.

Fix each end with 3/ 90mm nails

LUMBERLOK CT200 fully nailed with 30 x 3.15mm or Wire Dog fixing plus 2/ 90mm skew driven nails
CONSTRUCTION DETAILS FOR OUTRIGGER/PURLIN COMBINATION

(SPANS & CENTRES AS TABLE 3 ON PAGE 2)

1. Fix first fly rafter at each purlin/outrigger with 4/90mm nails up to purlin number 4.
2. Fix outer fly rafter to first fly rafter with 90mm nails @ 150mm crs. staggered.
3. Minimum dimension 1.5 times the cantilever length.
4. Double standard rafter/truss or special design.
5. Min. 2/90mm nails to rafter/truss plus LUMBERLOK Joist Hanger JH47x90 fully nailed with 30 x 3.15mm.
6. LUMBERLOK CT200 fully nailed with 30 x 3.15mm plus 2/90mm skew driven nails.
7. Outrigger lined up directly below each purlin. See Table 3 for size and orientation.
8. Fix purlins to outrigger with 90mm nails @ 50mm crs.
9. First outrigger combination to be directly over end wall.
10. 3/90mm nails plus 1/ LUMBERLOK Multigrip fully nailed with 30 x 3.15mm.
11. LUMBERLOK Strap Nail each side.
12. Fix first fly rafter at each purlin/outrigger with 4/90mm nails up to purlin number 4. Fix outer fly rafter to first fly rafter with 90mm nails @ 150mm crs. staggered.

CROSS SECTION

LUMBERLOK CT200 fully nailed with 30 x 3.15mm plus 2/90mm skew driven nails.
Purlin directly over outrigger. Fix with 90mm nails @ 50mm crs.
LUMBERLOK Joist Hanger JH47x90 fully nailed with 30 x 3.15mm.
Minimum dimension 1.5 times the cantilever length.

LAYOUT

Top dropped gable end truss/rafter
LUMBERLOK CT200 fully nailed with 30 x 3.15mm plus 2/90mm skew driven nails.
Double standard rafter/truss or special design.

Fix purlins to outrigger with 90mm nails @ 50mm crs.
Outrigger lined up directly below each purlin. See Table 3 for size and orientation.
First outrigger combination to be directly over end wall.
3/90mm nails plus 1/ LUMBERLOK Multigrip fully nailed with 30 x 3.15mm.
LUMBERLOK Strap Nail each side.
Fix first fly rafter at each purlin/outrigger with 4/90mm nails up to purlin number 4. Fix outer fly rafter to first fly rafter with 90mm nails @ 150mm crs. staggered.

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