Technical Note

Replacement of a Heavy Roof with a Light Weight Gerard Roof

Gerard Roofs pressed steel tiles can be installed in place of a heavy weight roof such as concrete or clay tile.

Rafter/Truss - Top Plate Fastening

The change in roofing material weight may need an increase in the rafter to top plate fastenings performance. There may be a need to increase the load capacity of the rafter/top plate fastenings around the perimeter of the house or building due to the reduced weight on the structure. The rafter top plate fastenings should be increased if they do not match or exceed the fasteners shown in **Table 1**.

Truss spacing (mm)	Fixing types of roof trusses at supports for wind zones (table 10.14.NZS 3604:2001)									
	Light weight roofs									
	900					1200				
Wind zone	Low	Medium	High	Very High	Extra High	Low	Medium	High	Very High	Extra High
Loaded dimension of support (m)										
3.0	E	E	E	E	F	E	E	E	F	F
3.5	E	E	E	F	F	E	E	E	F	SED
4.0	E	E	E	F	SED	E	E	F	SED	SED
4.5	E	E	E	F	SED	E	E	F	SED	SED
5.0	E	E	E	F	SED	E	E	F	SED	SED
5.5	E	E	F	F	SED	E	E	F	SED	SED
6.0	E	E	F	SED	SED	E	E	SED	SED	SED

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
E	2/90 x 3.15 skew nails + 2 wire dogs	4.7
F	2/90 x 3.15 skew nails + 2 strap fixing	7.0
SED	Specific engineering design required	Refer to a Gerard Roofs engineer

Highlighted area shows fastener load capacities that are the same for the loaded dimension of support for truss spacing of 900mm for light weight and heavy roof. No extra fastening of the rafter/truss top plate is required for these connection places.

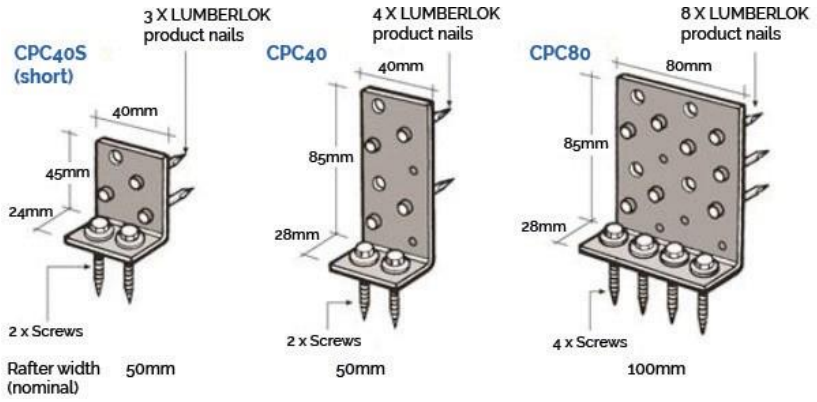
Alternative fixing which could be installed by roofer		
	Mitek - CPC40S each side of rafter	5.0
	Mitek - CPC40 each side of rafter	8.0

Table 1 Fixings Required for Rafter/Truss to Top Plate

Truss spacing (mm)	Fixing types of roof trusses at supports for wind zones (table 10.14.NZS 3604:2001)				
	Heavy roof				
	900				
Wind zone	Low	Medium	High	Very High	Extra High
Loaded dimension of support (m)					
3.0	E	E	E	E	E
3.5	E	E	E	E	E
4.0	E	E	E	E	F
4.5	E	E	E	E	F
5.0	E	E	E	E	F
5.5	E	E	E	F	F
6.0	E	E	E	F	SED

Table 1 Fixings required for rafter/truss to top plate

The increase in fastening load capacity may not be apparent until a section/tile of the roof is removed.



Uplift direction	CPC40S	CPC40	CPC80
Characteristic load	5 kN/pair	8 kN/pair	16 kN/pair

Fix as shown with LUMBERLOK product nails 30mm x 3.15 diameter
Type 17-14g x 35mm Hex Head Galvanised Screws*
Note: Stainless steel CPC use type 17-12g x 35mm Hex Head Stailess Steel Screws

Fixings

To top flange: LUMBERLOK product nails 30mm x 3.15 diameter.

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

Note: Stainless steel CPC use type 17-12g x 35mm Hex Head Galvanised Screws.

**With ceiling material use type 17-14g x 75mm screws.*

Material

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

Screws and nails not included with product.

Horizontal loads

Light weight roofs require less bracing than Heavy weight roofs; therefore existing bracing should be sufficient to meet the needs of NZS 3604. Refer to NZS 3604:2011 Section 10.3 System to brace horizontal loads. Table 10.16.

Roofing

The heavy weight roof and its supporting battens have to be removed as the batten spacing will not suit pressed metal tiles. Roofing underlay will have to be installed at the same time as the tile battens. Tile battens are installed using the correct type and number of batten fastenings as described in the Gerard Roofs Installation Manual Table 4.3.1 and **Table 2** below.

These fixings meet or exceed the requirements of NZS 3604:2011.

Tile batten size	Max span	Maximum span and fixing in the following wind zones										Specific design up to 70 m/s 7.5 kPa	
		Low 32 m/s 0.61 kPa		Medium 37 m/s 0.82 kPa		High 44 m/s 1.16 kPa		Very high 50 m/s 1.50 kPa		Extra high 55 m/s 1.86 kPa			
		Spacing	Fixing	Spacing	Fixing	Spacing	Fixing	Spacing	Fixing	Spacing	Fixing	Spacing	Fixing
(mm)		(mm)		(mm)		(mm)		(mm)		(mm)		(mm)	
Light Roofing Cladding													
50 x 40	900	370	S	370	S	370	S	370	S	370	T	370	U
50 x 50	1200	370	S	370	S	370	T	370	T	370	T	370	U

Fixing type	Description	Alternative fixing capacity (kN)
R	1 / 90 x 3.15 gun nail	0.55
S	2 / 90 x 3.15 gun nails	0.8
T	1 / 10 gauge self-drilling screw 80 mm long	2.4
U	1 / 14 gauge self-drilling screw 100 mm long	4.0

Table 2 Gerard Roofs Specific - Tile batten fastening schedule

These fastener selections take into account wind loading around the periphery of the roofs.

Gerard Roofs have instructed installers to use:
2 / 90 mm x 3.15 mm gun nails in areas up to and including the Very High Wind Zone (50 m/s) for all roofs on rafter spans up to and including 900 mm, exceeding the requirements of NZS3604:2011.
1 / 10 gauge self-drilling screw 80 mm long in the Extra High Wind Zone (55 m/s).

Tile Nailing

Max wind load	Fastening type	Approx. spacing fastener
3.8 kPa	4 nails/tile, and tile lap	360 mm
5.2 kPa	5 nails/Stratos, Alpine, Senator, Rockport & Oberon *or* 7 nails*/Heritage, Milano & Classic	245 mm Stratos, Alpine, Senator, Rockport & Oberon 180 mm Heritage, Milano & Classic

Table 3 Gerard Roofs Specific Tile Nailing Schedule

**Nail at each module, Classic tile - 8 nails/tile.*