TECHNICAL NOTE

Conversion from Heavy to Lightweight Roofs

Gerard's pressed steel tiles can be installed in place of a heavy weight roof such as concrete or clay tile. In some cases bracing and/or additional fastening may be required as follows.

Wind Uplift Resistance

Generally, buildings with heavy roofs are designed to resist downward pressure from the weight of the roofing material. When converting to a lightweight roof the structure should be sufficient to support the lighter load *(ref: NZS 3604:2011 Section 10.3 for bracing on horizontal loads)*. However, the building must take into account the need for increased resistance to uplift forces.
To achieve this additional fastening may need to be applied.

Top Plate Fastening

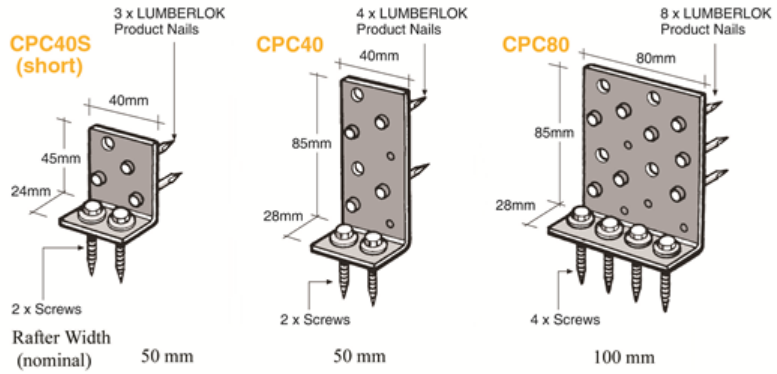
The change in roofing material weight may need an increase in the rafter to top plate fastenings performance. There may be a need to increase the load capacity of the rafter/top plate fastenings around the perimeter of the house or building due to the reduced weight on the structure. The rafter top plate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

Truss Spacing (mm)	Fixing Types of roof trusses at supports for all wind zones (table 10.14 NZS 3604:2011)									
	Light roofs									
	900					1200				
Wind zone	L	M	H	VH	EH	L	M	H	VH	EH
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	F	E	E	F	SED	SED
4.5	E	E	E	F	F	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 + strap fixing	7.0
SED	Specific engineeering design required	Refer to Gerard
Highlighted area shows fastener load capacities that are the same for the loaded dimensions of support for truss spacing of 900mm for lightweight and heavy roofs. No extra fastening of the rafter/truss top plate is required for these connection places.		
Alternative fixing which could be installed	Mitek – CPC40S each side of rafter	5.0
	Mitek – CPC40 each side of rafter	8.0

Truss Spacing (mm)	Fixing Types of roof trusses at supports for all wind zones (table 10.14 NZS 3604:2011)				
	Heavy roofs				
	900				
Wind zone	L	M	H	VH	EH
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
Fixing type	Alternative fixing capacity (kN)				
E	4.7				
F	7.0				

Mitek CPC Fastening and Load



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

Fix as shown.
To top flange: Lumberlok product nails 30mm x 3.15 diameter
To 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
Follow manufacturer's instructions.

Lintel Fixing to Prevent Uplift

In NZS 3604:2011, section 8.6.1.8, where lintels need to be secured against uplift, outlines the requirement to be secured at each end of a trimming stud which in turn shall be fixed to the floor framing. At the bottom plate, this can be achieved with either a 25x1mm strap with 6x 30x2.5mm nails into both blocking and stud, or a 7.5kN (tension) connection *(see NZS 3604:2011 Figure 8.12).* Many buildings with heavy

roofs will already have this in place. Ensure the building complies, otherwise further fastening may be required.

Roofing Battens

When converting to a Gerard lightweight roof, batten and underlay installation should be completed in accordance with the Gerard Installation Manual.