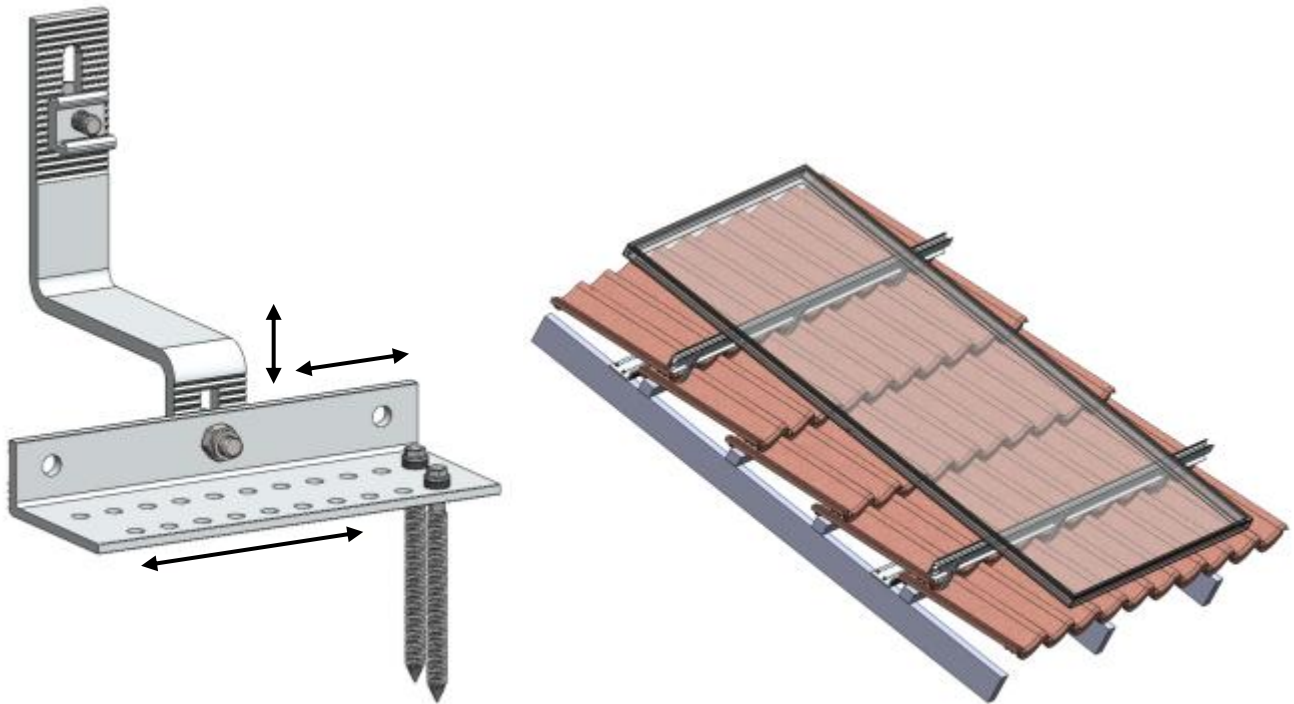


	Tile Brackets	created	JM
		checked	JL
		valid from	28/02/13
Tech. Bulletin	Rev. Nr. 6.1		

INTRODUCTION

Tile brackets are part of the SunLock mounting system for solar photovoltaic (PV) modules. The new SLTB005 adjustable tile bracket replaces both the old SLTB002 (fixed) and SLTB004 (adjustable) tile brackets.

Tile brackets are supplied pre-assembled with the same height and extension as the old fixed brackets. They can also be adjusted 6.5 mm up or 13 mm down if required. This can reduce or eliminate the need to grind or cut tiles.



GUIDE TO USE

Spacing

Tile brackets should be installed with a maximum spacing as shown in the tables on the drawings in the SunLock Installation Manual.

Note that the new SLTB005 tile bracket is stronger than the old fixed or adjustable versions, as the upper arm is extruded from 6082-T6 aluminium with yield strength of 255 MPa (which is of a similar strength to stainless steel). Version 4.2 of the installation manual contains new wider spacing tables to reflect this. Older SLTB002 or SLTB004 tile brackets should use the SunLock Installation Manual v4.1.

Positioning

Tile brackets can be positioned by:

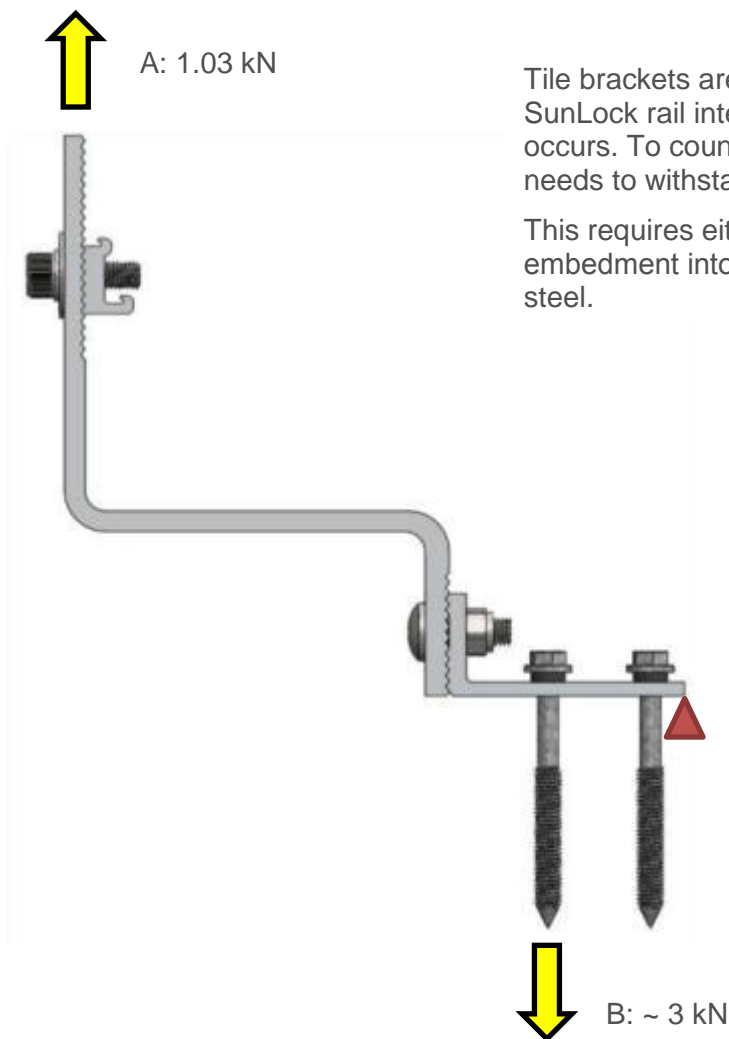
- Using a different pair of mounting holes in the base
- Moving the upper arm 13 mm down or 6.5 mm up
- Moving the upper arm sideways to another hole
- Using a 5 mm tile bracket spacer (SLTS005) between the rafter and the bracket

FIXING TO RAFTERS

Tile brackets can be fixed to:

- timber rafters (grade J4 or better), using screws with 80 mm embedment
- hardwood timber rafters (grade JD2 or better), using screws with 40 mm embedment
- steel rafters < 3 mm thick, using bolts
- steel rafters ≥ 3 mm thick, using Tek screws or bolts

Note that Tek screws can't be used to fix tile brackets to thin (< 3 mm) metal rafters, as they don't have sufficient fixing capacity. Either use bolts, or position a section of timber in the steel rafter, then fix using timber screws into the timber.



Tile brackets are able to withstand 1.03 kN uplift at the SunLock rail interface (Point A) before permanent bending occurs. To counteract this leverage, the fixing at point B needs to withstand ~ 3 kN.

This requires either a timber screw with at least 80 mm of embedment into softwood; or a Tek screw fixed to ≥ 3 mm steel.

TILE BRACKET LANDSCAPE ADAPTERS

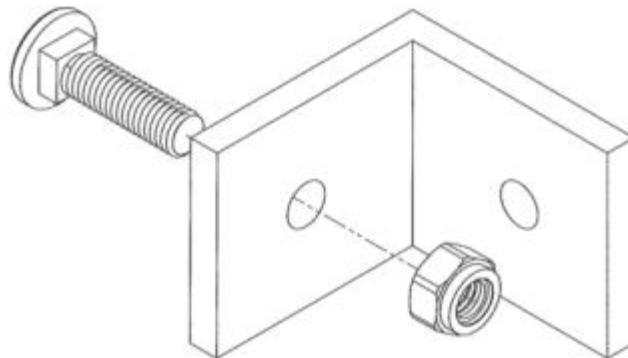
Solar modules can be mounted in landscape format on tiled roofs by fitting Tile Bracket Adaptors (SLTBLA01) between the tile brackets and the SunLock rails.



Tile bracket without adapter
(for portrait installations)



Tile bracket with adaptor
(for landscape installations)



Tile bracket adaptor assembly (SLTBLA01)

To fit the tile bracket landscape adaptor, follow these steps:

- Remove the key insert, M8 socket head cap screw and washers from the upper neck of the tile bracket. Set these to one side.
- Attach the tile bracket landscape adaptor to the tile bracket using the M8 cup head bolt and nyloc nut.
- Connect the tile bracket adaptor to the SunLock rail using M8 socket head cap screw, star washer and key insert which were removed in step 1.

Note: The top of the tile bracket should not protrude past the top of the SunLock rail as doing so will interfere with the installation of the PV panels.

TILE BRACKET SPACER

The tile bracket spacer can be fitted between the rafter and the tile bracket, to lift it by 5 mm. SunLock recommends using the 13 mm or 6.5 mm adjustment provided by the upper arm of the adjustable tile bracket (if possible) in preference to the tile bracket spacer.

SLTS005 tile bracket spacer

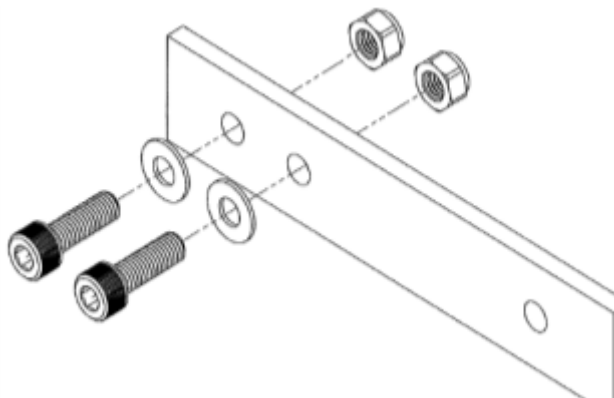


TILE BRACKET EXTENSION

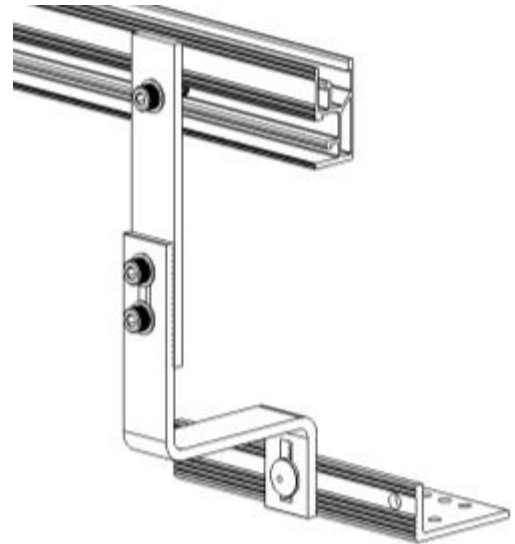
For applications which require the solar array to sit higher than is normally possible, a tile bracket extension must be used.

A typical situation includes when the system must be installed on non-standard tiles (e.g. Spanish tiles) that sit up higher than normal. Using the extension assembly allows the array to sit 100 mm higher.

Installing SunLock railing on the opposing side of the tile bracket (smooth side) should be avoided as this induces an increased leverage effect of the bracket and de-rates the ultimate capacity. If this is necessary for any reason, contact SunLock for advice.



Tile bracket extension (SLTBE01)



Tile bracket extension installed

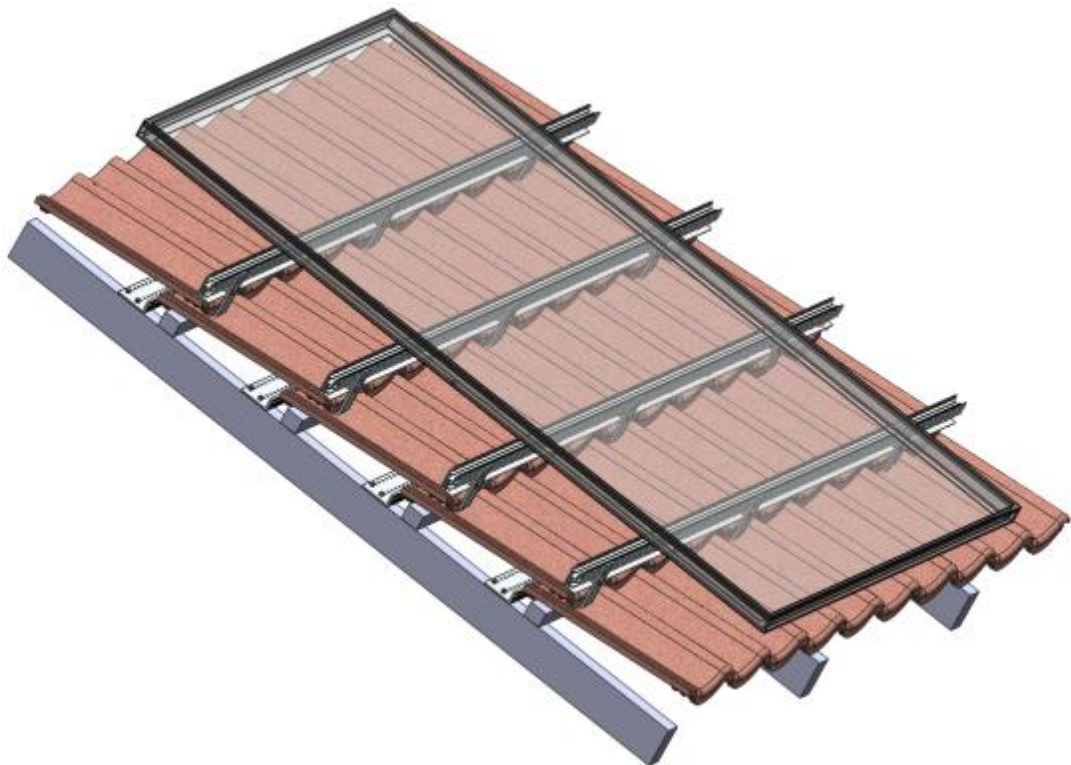
To fit the tile bracket extension, follow these steps:

- Unscrew the key insert, M8 socket head cap screw and washers from the upper neck of the tile bracket. Set these to one side.
- Attach the tile bracket extension assembly through the slot in the upper arm of the tile bracket. Ensure that the two cap screws are fastened through the slot and the supplied flat washers are attached.
- Take the fasteners originally attached to the tile bracket and use to secure the extension bracket to the SunLock railing. Ensure all fasteners are tightened.

USING FOUR RAILS

Using four rails per row effectively increases the allowable tile-bracket spacing, as the load on each tile bracket is reduced. This solution can be particularly useful in edge zones. Consideration needs to be made to ensure that an extra two tile brackets can be fitted to the rafter / truss structure of the roof.

All tile brackets / rail are to be fitted in the usual manner. This solution has been certified by Partridge Structural for wind regions A for both terrain categories 2 and 3. The certificate of compliance and the spacing tables can be found at the end of this technical bulletin.



4-rail / tile bracket installation

MOUNTING TILE BRACKETS ON STEEL RAFTERS (< 3 MM THICK)

Tile brackets can be installed on thin steel rafters in the following manner. Lift the tile to expose the steel rafter underneath. Place the tile bracket in position and mark out the required mounting holes.



Drill the marked holes. Attach tile bracket with M6 stainless steel fasteners (cap screws, flat washers and nyloc nut). M8's can be used if the holes in the base of the tile bracket are drilled out.



Note: an alternative solution is to insert a block of timber inside the steel purlin to replicate a timber rafter. Ensure that two 14-guage timber screws are used and each has a minimum embedment depth of 80mm.

TECHNICAL & SUPPLY CHAIN INFORMATION

Adjustable tile bracket

Sales code	SLTB005
Material	Aluminium 6082-T6 (upper) and 6106-T6 (lower), with stainless steel fasteners.
Australian Standard Certification	Certificate of structural adequacy to AS/NZS1170.2:2011 as included in the SunLock installation manual.

Tile bracket spacer

Sales code	SLTS005
Material	EP341R polypropylene impact copolymer
Australian Standard Certification	n/a

Tile bracket landscape adapter

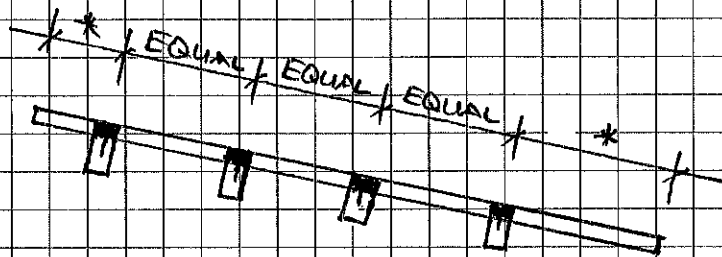
Sales code	SLTBLA01
Material	Aluminium 6106-T6, with stainless steel fasteners.
Australian Standard Certification	Certificate of structural adequacy to AS/NZS1170.2:2011 as included in the SunLock installation manual.

Tile bracket extension

Sales code	SLTBE01
Material	Aluminium 6060-T5, with stainless steel fasteners.
Australian Standard Certification	n/a

FURTHER INFORMATION

For further information contact Apollo Energy on 1300 855 484 or sunlock@apolloenergy.com.au.



* CANTILEVER 10% - 25% OF PANEL SIZE

- TABLE 1 TO BE READ IN CONJUNCTION WITH SUNLOCK DRAWING
2011.0063 - S9 - C DATED 31.08.12

TERRAIN CATEGORY 3			
MAXIMUM RAFTER SPACING 'S' IN mm, FOR TILED ROOFS OF PITCH 10°-20°			
LOCATION	No OF RAILS	WIND REGION A	WIND REGION B
INTERNAL ZONE	4	1595	N/A
INTERMEDIATE ZONE	4	1060	N/A
EDGE ZONE	4	800 (900 #)	N/A

MAX PANEL CANTILEVER 20% OF PANEL SIZE

TABLE 1



- TABLE 2 TO BE READ IN CONJUNCTION WITH SUNLOCK DRAWING

2011.0063 - S10 - C DATED 31.08.12

TERRAIN CATEGORY 3			
MAXIMUM RAFTER SPACING 'S' IN mm, FOR TILED ROOFS OF PITCH 20°-30°			
LOCATION	No OF RAILS	WIND REGION A	WIND REGION B
INTERNAL ZONE	4	1800	N/A
INTERMEDIATE ZONE	4	1800	N/A
EDGE ZONE	4	1480	N/A

TABLE 2

- TABLE 3 TO BE READ IN CONJUNCTION WITH SUNLOCK DRAWING

2011.0063 - S1 - F DATED 31.08.12

TERRAIN CATEGORY 2			
MAXIMUM RAFTER SPACING 'S' IN mm, FOR TILED ROOFS OF PITCH 10°-20°			
LOCATION	No OF RAILS	WIND REGION A	WIND REGION B
INTERNAL ZONE	4	1100	N/A
INTERMEDIATE ZONE	4	730 (900 #)	N/A
EDGE ZONE	4	550	N/A

MAXIMUM PANEL CANTILEVER 18% OF PANEL SIZE

TABLE 3

Project ENERGY MATTERS

Job No. 2011.0063 Date 18/01/13 Page 3/3

Subject SUNLOCK - TILED ROOFS



PARTRIDGE

STRUCTURAL | REMEDIAL | EVENT

- TABLE 4 TO BE READ IN CONJUNCTION WITH SUNLOCK DRAWING
2011.0063 - S2 - F DATED 31.08.12

TERRAIN CATEGORY 2			
MAXIMUM RAFTER SPACING 'S' IN mm, FOR TILED ROOFS OF PITCH 20°-30°			
LOCATION	No OF RAILS	WIND REGION A	WIND REGION B
INTERNAL ZONE	4	1800	N/A
INTERMEDIATE ZONE	4	1360	N/A
EDGE ZONE	4	1020	N/A

TABLE 4

January 23rd 2013



Energy Matters Pty Ltd
Level 2, 101-105 Clarke Street
South Melbourne VIC 3205

Attention: Mr Jeremy Lawrence

CERTIFICATE OF STRUCTURAL ADEQUACY

**Project Description: SunLock Solar Panel Roof Mounting System
4-Rail Variation for Tiled Roofs for Region A and Terrain
Categories 2 & 3**

We, Partridge Structural Pty Limited, being professional Structural Engineers within the meaning of the Building Code of Australia, hereby certify that we have reviewed the structural design of the SunLock Solar Panel Roof Mounting System as detailed in the document listed below and the Sunlock Rooftop Installation Manual Version 4.3 and that this work is in accordance with the relevant provisions of the Standard Building Codes and in accordance with accepted engineering practice and principles.

Document No.: J2011.0063 Page 1-3 of 3 dated 18/01/13.

This certification is subject to the limitations imposed on the system as detailed in the SunLock Rooftop Installation Manual Version 4.3. This document does not constitute certification of the existing roof structure to which the mounting system is to be fixed. Adequacy of the existing structure should be determined on site by the installer prior to installation.

This certificate shall not be construed as relieving any other party of their responsibilities, liabilities or contractual obligations.

A handwritten signature in black ink, appearing to read 'Rob O'Reilly'.

Rob O'Reilly

BE(Hons) MIEAust CPEng NPER(Structural) RPEQ

For and on Behalf of:
Partridge Partners Pty Ltd