Rooftop Installation Manual

Version 4.3 – updated September 2012

www.sunlock.com.au

CONTENTS

INTRODUCTION

Thank you for choosing the SunLock solar panel roof mounting system. Made from custom-designed aluminium extrusions and components, SunLock's streamlined design and improved frame strength greatly simplify solar panel installation.

Offering a high level of adjustability for module width and depth SunLock's versatile design makes it suitable for a wide variety of building types and zones including residential, commercial and remote environments.

SunLock is backed by a 10-year warranty and is compliant with the AS/NZS1170.2:2011 on wind actions, AS/NZS16641.1:1997 on aluminium structures, AS1720.1:2012 on timber structures, AS/NZS4600:2005 on cold-formed steel structures.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. This symbol is not used for hazards relating to property damage unless there is also a risk of personal injury to this level.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to draw attention to unsafe practices that may cause damage to property.

SAFETY AND INSTALLER RESPONSIBILITIES

Handling and Installing SunLock

It is critically important that safety practices are observed when installing SunLock.

- Do not throw or roughly handle any SunLock components.
- Do not bring SunLock into contact with sharp or heavy objects.
- Do not modify SunLock components in any way. The exchange of bolts, drilling of holes, bending or any other physical changes not described in standard installation procedure will void the warranty.
- It is the installer's responsibility to verify the integrity of the structure to which SunLock is fixed. Roofs or structures with rotten/rusted purlins, undersized purlins, excessively spaced purlins, or any other unsuitable substructure cannot be used with SunLock, and installation on such structures will void the warranty, and could result in death or serious injury.

Wind and Climate Design

A SunLock frame installed in accordance with this installation manual is compliant with AS1170.2:2011.

This manual (including the drawings) cannot cover all types of buildings and eventualities.

For buildings outside the limits stated on the drawings (maximum 10 m roof height, maximum roof pitch 35°, slopes, hills) contact a structural engineer for a custom design.

AS/NZS1170.2:2011 provides guidance on determining the wind pressures applicable to your SunLock install site, taking into account roof shape and geographic location. Sufficient guidance is given in this document, but you may wish to procure a copy of these standards if your company installs Australia/New Zealand wide.

- REMEMBER average wind speeds are higher for structures mounted closer to the roof perimeter zone (edge).
- Make sure your installation complies with local and national building codes. Take into account relevant design parameters (wind speed, exposure and topographic factor) when determining the loading for the installation.
- If alternative fasteners are used to fix the framing to the roof (assuming supplied fasteners are unsuitable for any reason), all screw fasteners must conform to corrosion resistance Class 4 Australian Standard AS3566 and be of equal or greater strength to those supplied with your SunLock order.

INSTALLATION OF THIS PRODUCT IS TO BE PERFORMED ONLY BY PROFESSIONALLY TRAINED INSTALLERS.

Any attempt by an unqualified person to install this product could result in death or serious injury.

TECHNICAL SPECIFICATIONS

Applications

- Commercial and residential buildings
- Marine applications and remote areas

Features

- 6106-T6 aluminium extrusion with 210 MPa yield strength
- Ripple design on rail, L-foot and tile brackets increases joint strength
- Suitable for buildings up to 10 m in height
- Suitable for roof slopes in the range from 0° to 35°
- Inherent corrosion resistance resulting in low ongoing maintenance and an extended product life.
- Complies with Australian/New Zealand Standard on Wind Actions, AS/NZS1170.2:2011
- Optional anodised finish (standard is mill finish)
- Australian design and manufacture

Custom Design

A SunLock frame can be designed to suit almost any roof and wind region, including buildings up to 200 m in height, roof pitches up to 65°, and located on slopes or hills.

For a custom design please contact either SunLock or an Australian registered structural engineer.

BEFORE INSTALLING

Receipt of Goods

Check that the SunLock equipment is undamaged and that the order is complete. Check for correct quantities of the following items:

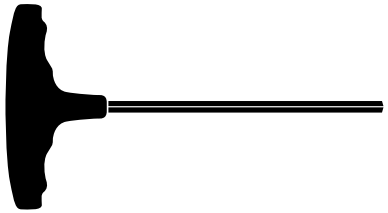
- **Rails:** slightly more than twice the length of the proposed solar array in linear metres
- **End clamps:** a minimum of 4 per row (unless 3 rails are required) of panels (fitted at the ends)
- **Mid clamps:** 2 for every gap between neighbouring panels, e.g. number of panels in row, minus one, multiplied by two.
- **L-feet or Tile Brackets:** at least 2 for each panel; L-feet, roof screws and isolation washers for steel roof interfaces; tile brackets and rafter screws for tile roofs. Refer to the drawings to determine the number of fixings required.

CAUTION

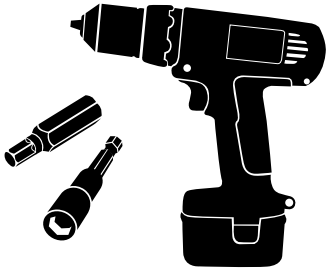
Refer to the section 'Designing Your Framing System' before attempting installation. Failure to correctly establish the requirements of the proposed installation site is dangerous and will void the framing warranty.

Tools Required for Installation

- T-bar Allen Key or 6 mm hexagonal driver bit. If using a 6 mm driver bit, make sure the cordless power tool used for driving has a hand-tight clutch setting and a fine (soft) impact drive to prevent damage to the fragile glass panels and threads on the SunLock framing.

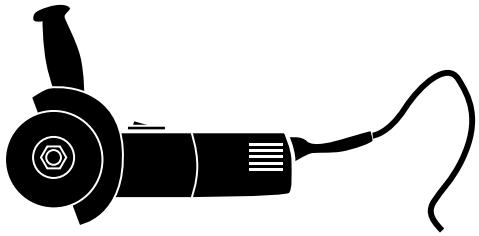


- Drill or impact driver for driving roof material fixings.

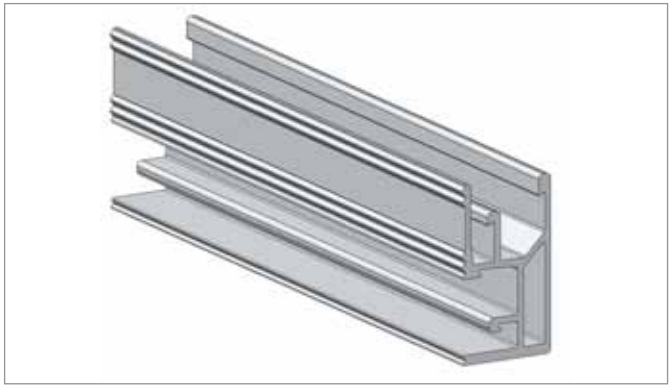


- Gloves for handling SunLock framing (aluminium can develop sharp corners).

- For terracotta tile roof installation, an angle grinder fitted with a continuous edge diamond tipped tile-cutting blade; gloves, hearing protection, a face protection mask, and a suitably rated breathing protection mask for all people in proximity of grinding.



SUNLOCK COMPONENTS



SL2R – Rails, in pairs, hold each panel row and are custom designed and Australian made 6106-T6 extruded aluminium.

Note: custom rail lengths available on request. Minimum order quantity, deposit & lead time apply.

Rail lengths	
For standard 808 mm wide panels	For wider 990 - 1005 mm wide panels
2600 mm	2100 mm
3410 mm	3200 mm
	4200 mm

SLJ150 – Joiners extend SunLock Rails to any length as required by the quantity or width of the solar panels.

SLLF – L-foot roof mounts secure the railing to steel roofs.

Each L-foot is supplied with a potable grade EPDM washer to prevent water ingress or galvanic corrosion with the roof material.

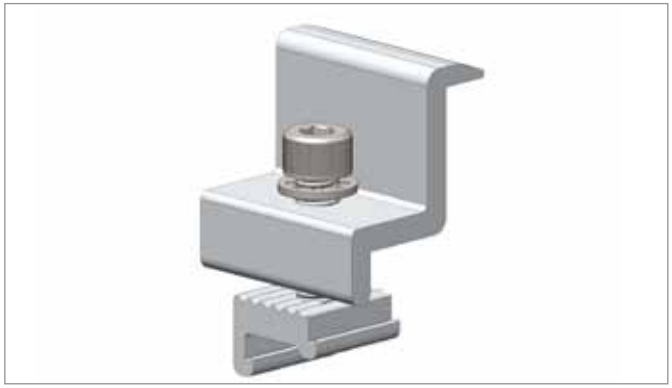
SLLF002 – standard, with a 75 mm roofing screw

SLLF004 – with a Tek screw

SLLF005 – with a 10 mm hole in the base

SUNLOCK COMPONENTS (CONTINUED)

SLTB005 – Adjustable tile brackets allow adjustment of the elevation and side position of the bracket to provide a closer fit for different tile batten heights, tile profiles, and tile positions. Each tile bracket includes two 90 mm roofing screws. If attaching to hardwood of minimum joint group JD2, these can be substituted by 50 mm screws.

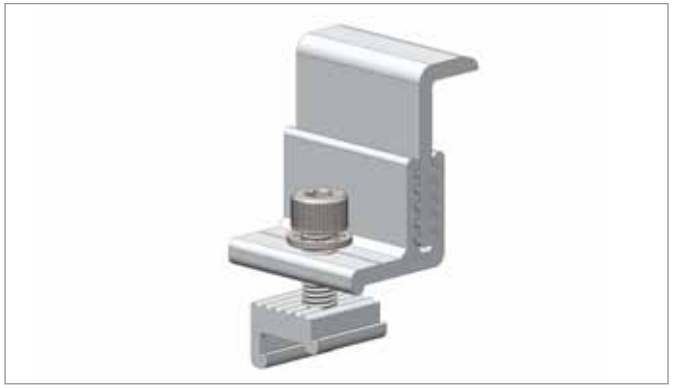


SLECF - Fixed end clamps are available in 35, 38, or 45 mm heights, and are simple and fast to install.

SLECF35 – 35 mm panels

SLECF38 – 38 mm panels

SLECF45 – 45 mm panels



SLEC – Adjustable End Clamps allow the easy modification of the clamp to suit almost any panel frame height. Note: Minimum of two fins must be engaged.

SLEC003 – 30 - 42 mm panels

SLEC004 – 34 - 46 mm panels

SLEC006 – 46 - 58 mm panels

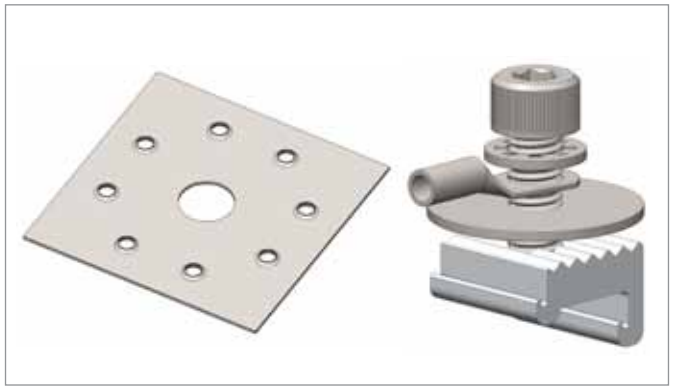
SUNLOCK COMPONENTS (CONTINUED)

SLMC – Mid clamps fit between panels and hold the panels to the rails. Two variations are available, differing only by the length of the cap screw.

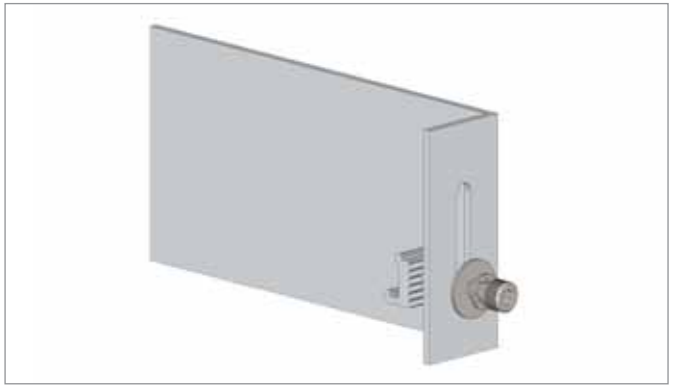
SLMC014 – 30 - 40 mm panels

SLMC016 – 40 - 50 mm panels

Note: Other panel thickness accommodated by special orders.



SLEL – EarthLock system comprises the EarthLock washer (SLELW) and the EarthLock bonding terminal (SLELBT). This system provides earth continuity from each panel frame to the rail, allowing the quick and effective connection of the array to an earthing cable if required.



SLIMB – Isolator Mounting Bracket is easily attached to the SunLock rail and provides a mounting surface for the rooftop DC isolator.

SUNLOCK COMPONENTS (CONTINUED)

SLTL – Tilt Leg kits comprise one front leg and one rear leg. The front leg is 150 mm long.

SLTL300 – 300 mm rear leg

SLTL500 – 500 mm rear leg

SLTL600 – 600 mm rear leg

SLTL700 – 700 mm rear leg

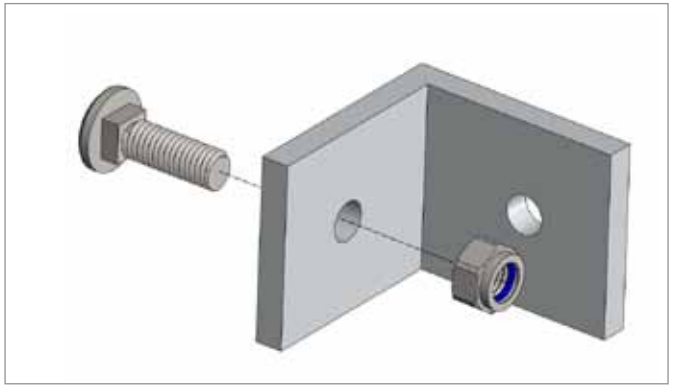
SLTL800 – 800 mm rear leg

SLCA – Channel Assembly allows tilt arrays to be correctly inclined, even if the purlins are not ideally spaced or located. The channel has outer dimensions of 41.3 x 41.3 mm and is extruded from 6061-T6 structural grade aluminium with a minimum yield strength of 240 MPa.

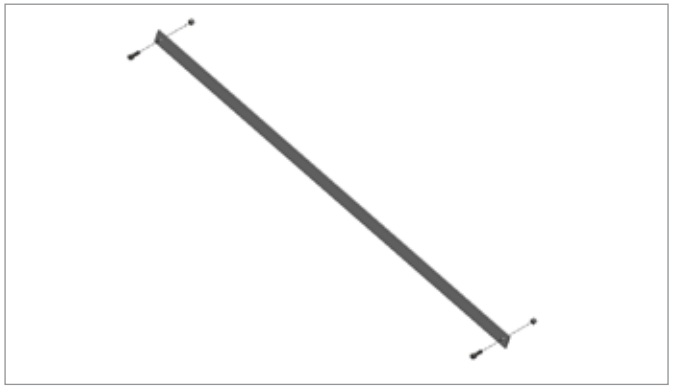
SLCA1500 – 1500 mm long, 1 L-foot

SLCA2000 – 2000 mm long, 2 L-foot

SLCA3000 – 3000 mm long, 2 L-foot



SLTBLA – Tile bracket landscape adaptors can be used in conjunction with a tile bracket to convert a traditional portrait solar array into landscape format.



SLDB1200 - Diagonal brace is to be used on each end of each row of the tilt array to provide bracing against side loads.

DESIGNING YOUR FRAMING SYSTEM

Design your system:

1. Select the correct drawing
2. Determine the width of the edge zone
3. Read off the maximum fixing spacing and calculate the total number of fixings required

The ten drawings are as follows:

S1 – Tile roofs of pitch 10 - 20°
S2 – Tile roofs of pitch 20 - 35°
S3 – Tin roofs of pitch 10 - 20° with steel purlins
S4 – Tin roofs of pitch 20 - 35° with steel purlins
S5 – Tin roofs of pitch 10 - 20° with timber purlins
S6 – Tin roofs of pitch 20 - 35° with timber purlins
S7 – Tilt legs on roofs with steel purlins
S8 – Tilt legs on roofs with timber purlins
S9 – Tile roofs of pitch 10 - 20° (terrain category 3)
S10 – Tile roofs of pitch 20 - 35° (terrain category 3)

The installation site, roof material, roof angle, the size and quantity of solar panels and the number of module rows used will determine the dimensions, quantity and layout of framing components required for installation. This section of the installation manual can assist you to determine critical job specifications.

In most cases the SunLock frame itself (rails and clamps) is strong enough to withstand any wind load. When designing the frame, the two main points to consider are:

- ensuring sufficient fixings are used to hold the SunLock frame to the roof frame
- ensuring the roof frame itself is not overloaded by the extra wind load from the solar system

Ten drawings have been supplied with this installation manual, one for each roof type. Select the appropriate drawing for the installation site and follow the detailed instructions contained within it.

Note the following details:

When a panel ‘covers’ three roof battens, then three rails should be used. This ensures that the battens are not overloaded by the point loads from the L-feet. In other words, for tin roof installations where the purlin spacing is less than 750 mm, three rails should be used per row of panels.

Ensure panels are installed in accordance with the solar panel manufacturer’s installation manual. Typically, these manuals state that the clamps holding the panel to the rail must be installed in a certain region, commonly a maximum of 10-25% of the length of the panel from each end of the panel.

FIXING LOCATIONS AND ARRAY PLACEMENT

Solar panels can be installed anywhere on the roof, as long as sufficient fixings are used. Higher wind speeds are encountered at the edges of roofs and therefore more fixings are required in these areas.

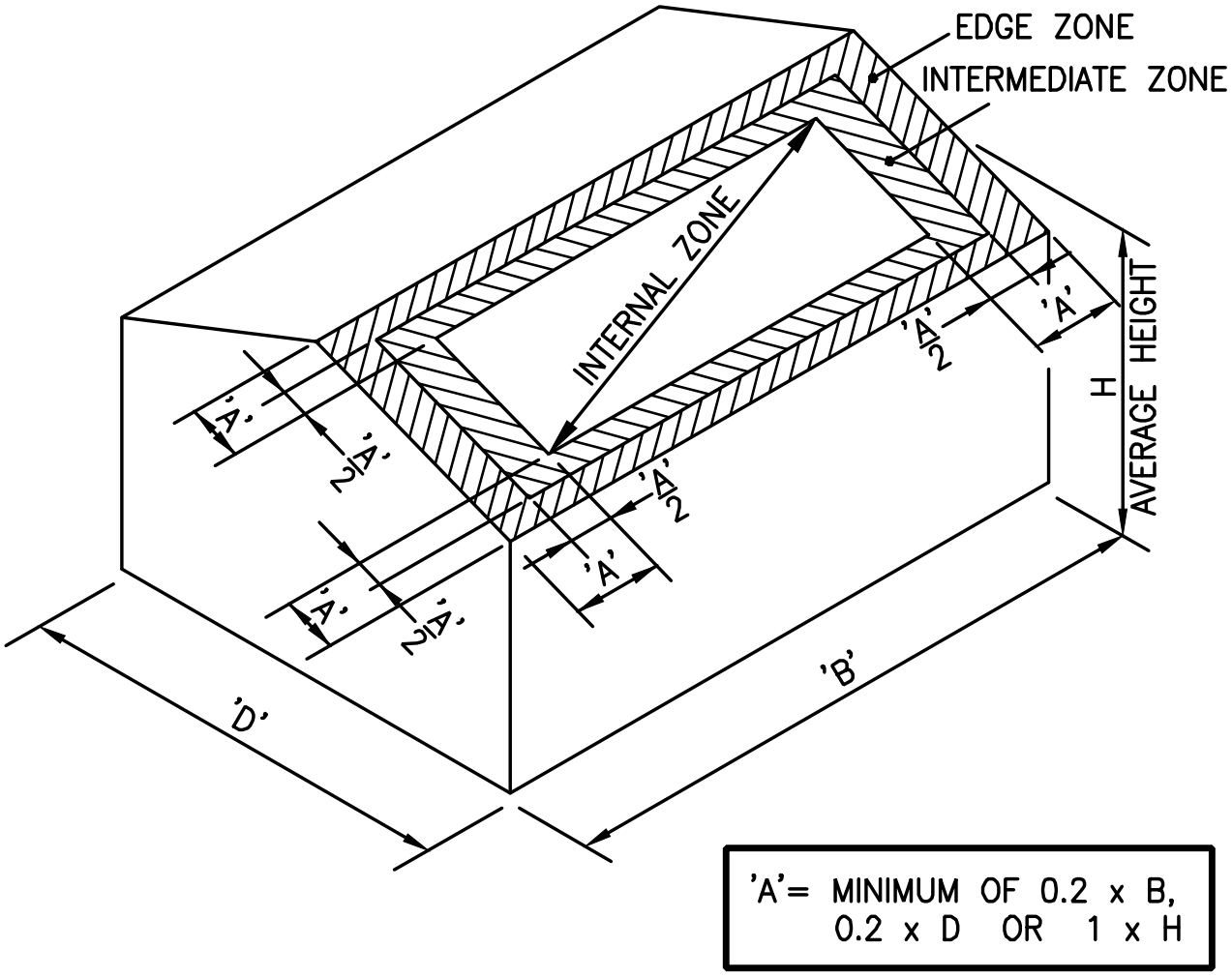
A roof can be divided into three zones, the internal zone, intermediate zone and the edge zone. The width of these outer zones can be determined based on the length, width and average height of the building.

If fixings are located in the intermediate or edge zones, then the maximum spacing to the next fixing must be reduced, as per the table in the drawings.

Determining the width of the edge and intermediate zones, 'A'

The width of the edge and and intermediate zones, 'A', is determined by calculating each of the following values, and then using the smallest:

- 0.2 x B
- 0.2 x D
- H



WIND REGION MAP AUSTRALIA (in accordance with AS/NZS1170.2:2011)

Included towns:

Region A:

- Callytharra Springs
- Gascoyne Junction
- Green Head
- Kununurra
- Lord Howe Island
- Morawa
- Toowoomba
- Wittanoom
- Bourke

Region B:

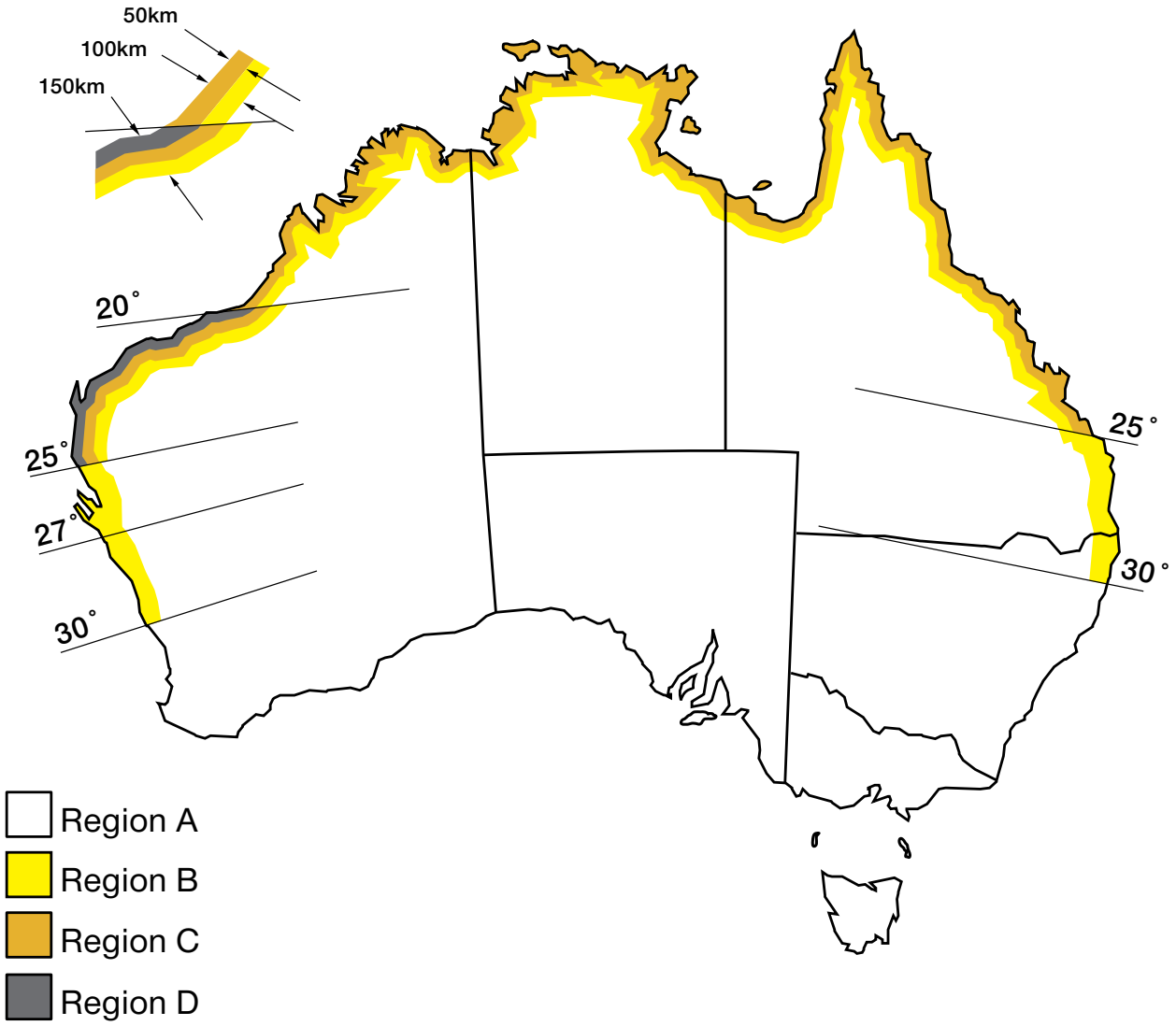
- Adelaide River
- Atherton
- Biloela
- Brisbane
- Christmas Island
- Collinsville
- Corindi
- Geraldton
- Ivanhoe
- Kyogle
- Marble Bar
- Mullewa
- Norfolk Island
- Torres Strait Islands
- Wyndham

Region C:

- Borroloola
- Broome
- Bundaberg
- Burketown
- Cairns
- Cocos Islands
- Darwin
- Derby
- Karumba
- Mackay
- Mareeba
- Millstream
- Moreton
- Nhulunbuy
- Normanton
- Rockhampton
- Townsville

Region D:

- Carnarvon
- Exmouth
- Karratha
- Onslow
- Port Hedland



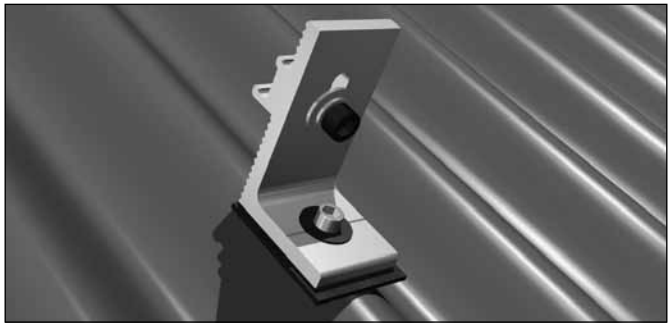
INSTALLATION

Start any roof/structure installation by marking the fixing points at the calculated centres and spacing along the proposed length of the array (in a parallel row).

Installing L-Feet on Steel Roofs:

For a steel roof with exposed fixings

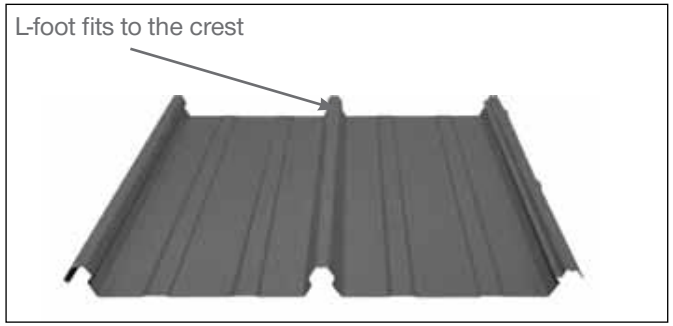
1. Determine where the roof mounts will be positioned based on position of existing roof screws.
2. Do not remove existing roof screws. Instead, install on unused crest. This is because the existing screws are there to hold down the roof sheet, while the new screws are there to hold down the solar system.
3. Fix L-feet in place and fix with the upright part of the 'L' facing towards the ridge of the roof.
4. Secure the L-foot roof mounts with the roof screws. Use the supplied isolation washers between the base of the L-foot and the roof surface.



For a steel roof with hidden fixings (clip-type roofing)

1. Lift the sheets of steel to expose the structure beneath.
2. Using a marker, mark out the precise locations of the structure below the roofing material and clip the roof back in place.
3. Place L-feet on the markings and screw down with supplied isolation washers between the base of the foot and the roof surface.

   Note: SunLock can only be attached to "406" style roof sheets.



INSTALLATION (CONTINUED)

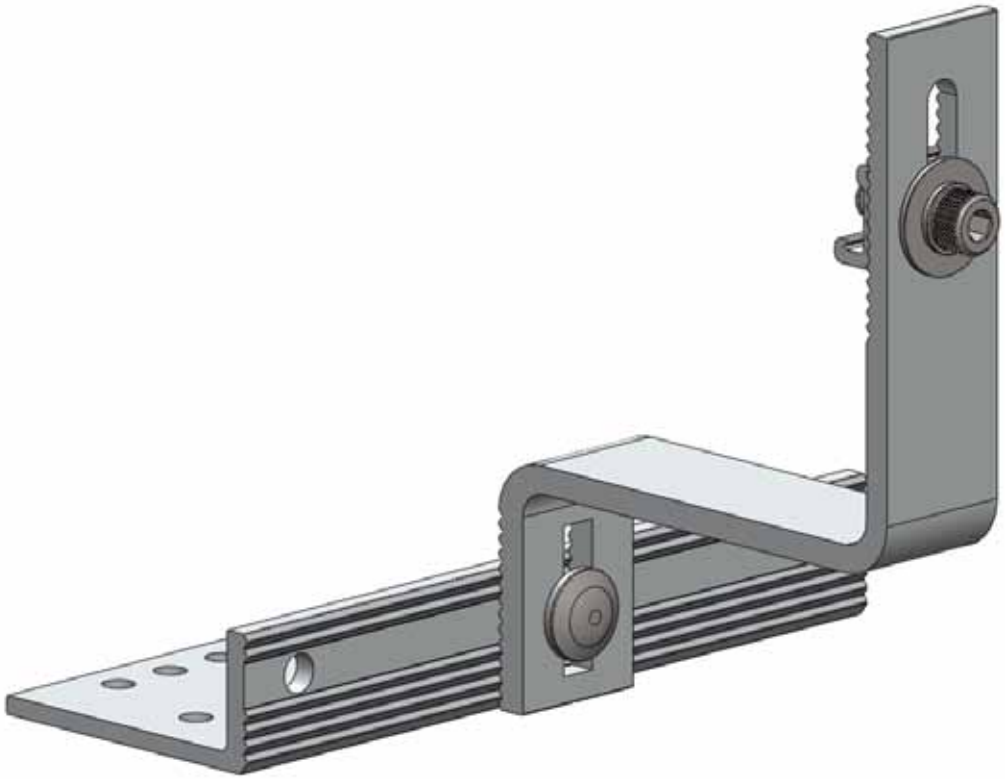
Installing Tile Brackets

Installation of the SLTB005 Adjustable Tile Bracket requires no special tools – only a 13 mm socket/spanner and the 6 mm internal hex driver/Allen key normally used for SunLock framing.

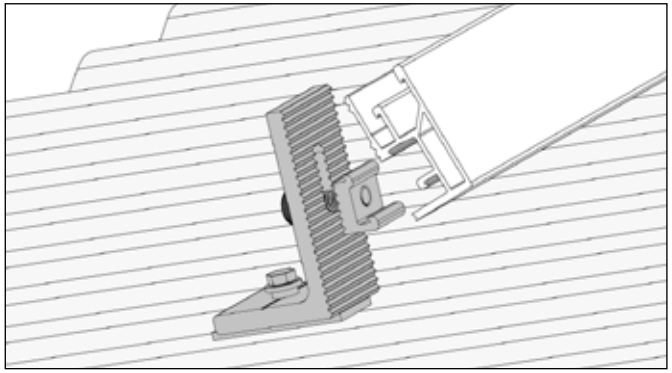
- Expose the timber rafters where the SunLock Tile Brackets are to be attached by sliding or removing tiles at a suitable spacing
- Loosely assemble the tile brackets ready for adjustment. Place the first tile bracket on a rafter and adjust the elevation to a low and flush fit. Use a 13 mm socket to secure the bolt assembly. Generally, the other brackets on the roof can be adjusted to the same elevation position.
- Attach the tile brackets to the rafters using the supplied screws. To prevent splitting the timber, pre-drill the screw holes at an inward facing angle. This is especially important for hardwood rafters.
- Move the tiles back into place. Attach the SunLock rails to the Adjustable Tile Bracket uprights, and your framing installation is nearly complete.

Tile brackets are supplied as standard with 90 mm timber roofing screws, which supply the required 80 mm embedment in softwood rafters. For hardwood rafters, the embedment can be reduced to 40 mm (i.e. use at least a 50 mm screw, or longer if you have any packers between the tile bracket and the rafter).

If the purlins are steel (e.g. cold formed galvanized c-sections), note that Tek screws cannot be used unless the purlin is at least 3 mm thick, as they do not have sufficient pull out capacity. Other options are to position a section of timber in the section and screw into the timber, or use bolts, washers and nuts.

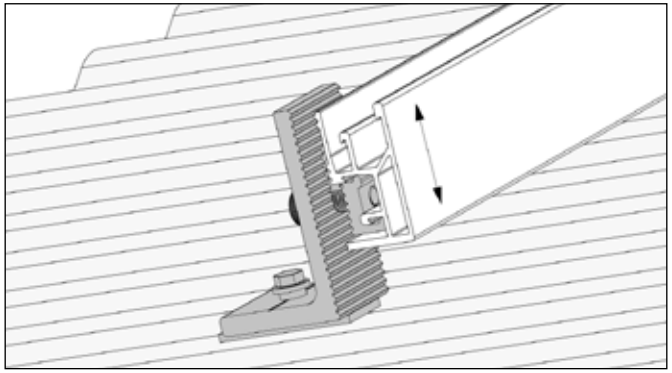


INSTALLATION (CONTINUED)



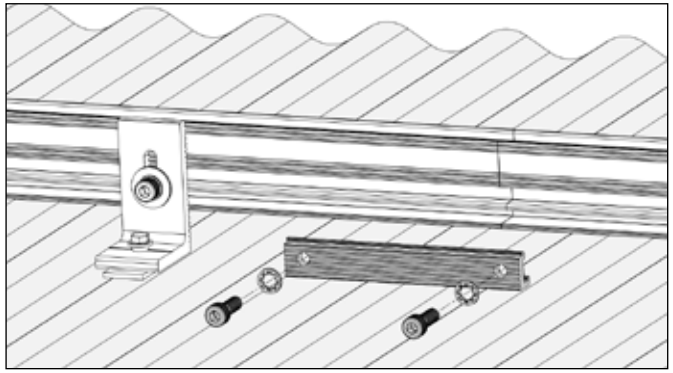
1. Connecting Rail to Roof Mounts

Connect the rail to the roof mounts by inserting the roof mount keylock into the rail channel. Make sure the ridged rail surface faces the ridged surface of roof attachments. Fasten the cap screw on the keylock 2-3 turns to loosely hold the rail in position.



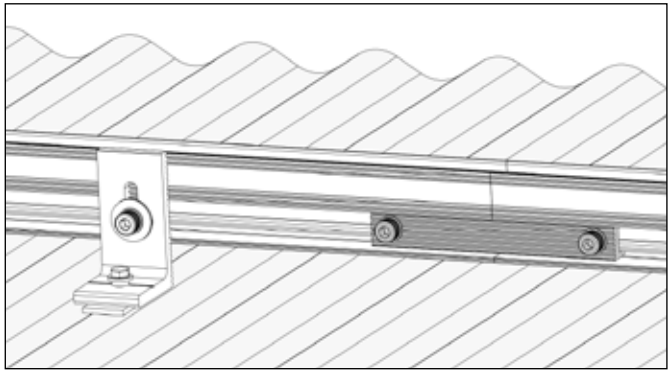
2. Connecting Rail to Roof Mounts

The rail can be adjusted vertically within the roof attachment slot when bolts are loosely fastened.



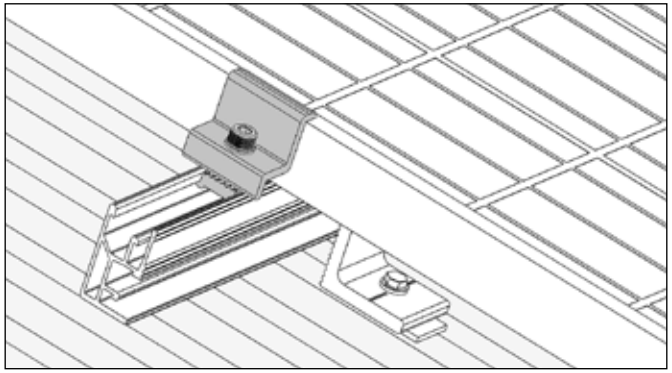
3. Connecting Multiple Rails

Join rail segments by inserting the rail joiner into the rail channel.



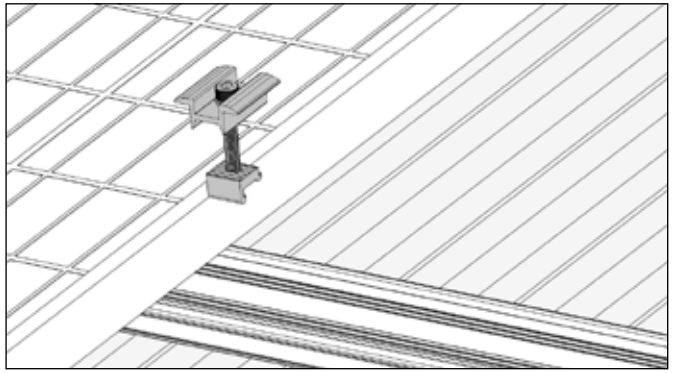
4. Connecting Multiple Rails

Fasten cap screws to secure.



5. Installing End Clamps

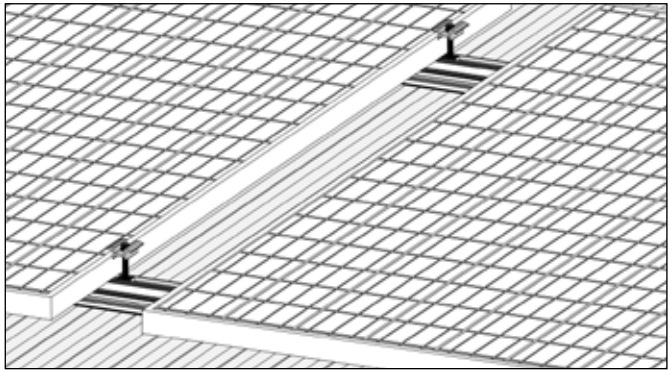
Insert keylock of the end clamp into the rail channel. Using a 6 mm hex driver/Allen key, secure the first solar panel to the railing starting as close to the end of the row as possible. A minimum of 50 mm between the end of the rail and edge of the first solar panel is required.



6. Installing Mid Clamps

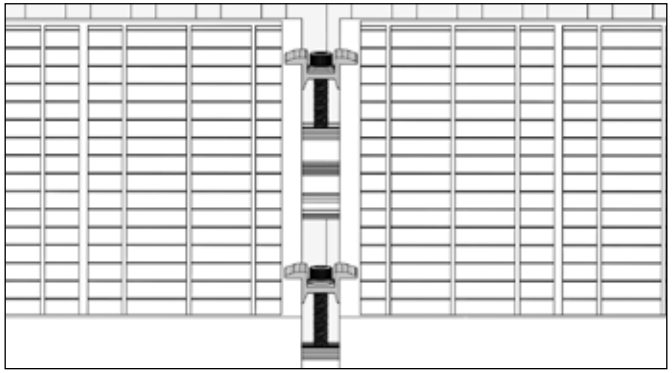
Insert the keylock of the mid clamp into the rail channel and position the clamp against the first panel frame. Hand-tighten the screw 2-3 turns to loosely hold the clamp in position. Ensure the EarthLock washer is placed between the SunLock rail and the frame of the panel.

INSTALLATION (CONTINUED)



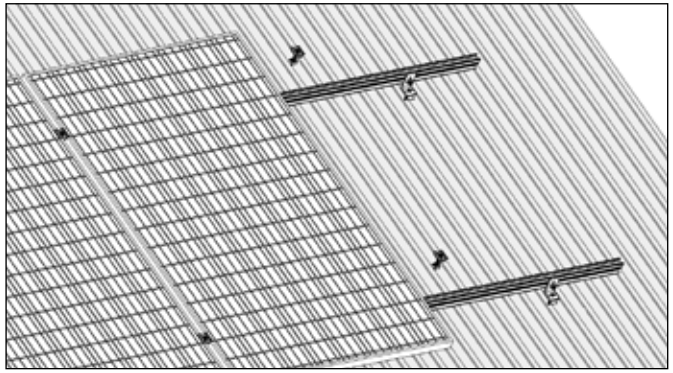
7. Installing Mid Clamps

Slide second panel firmly into place against the mid clamps and fasten bolts.



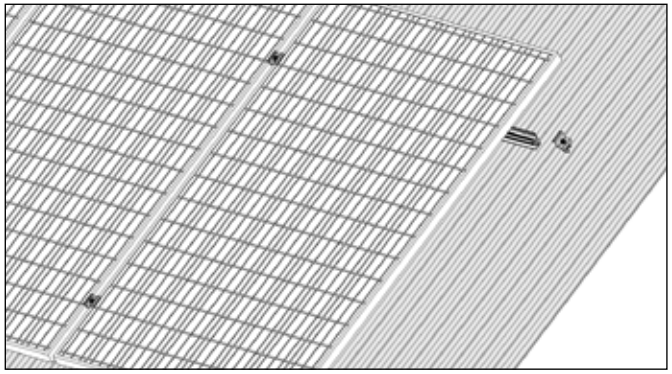
8. Check Alignment of the Array

After fixing the first 2 panels, check that the array is straight. If there appears to be a deviation from square (e.g. if the ridge cap shows the row to be falling or rising slightly), readjust the panels until they appear square with the roof. Alternatively, measure the distance from the rail to the edge of the panel.



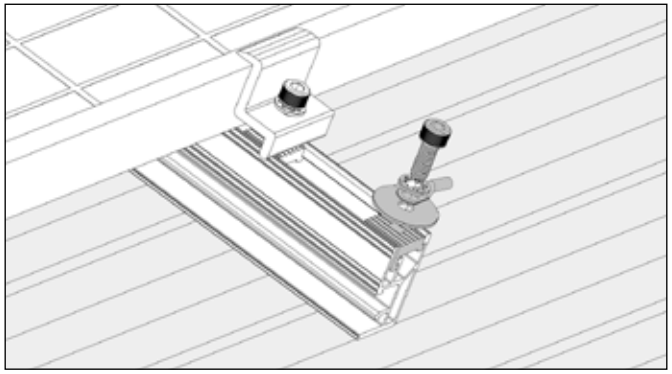
9. Continue Installing Mid Clamps

Continue to clamp the neighbouring panels in the array to the rails.



10. Install End Clamps

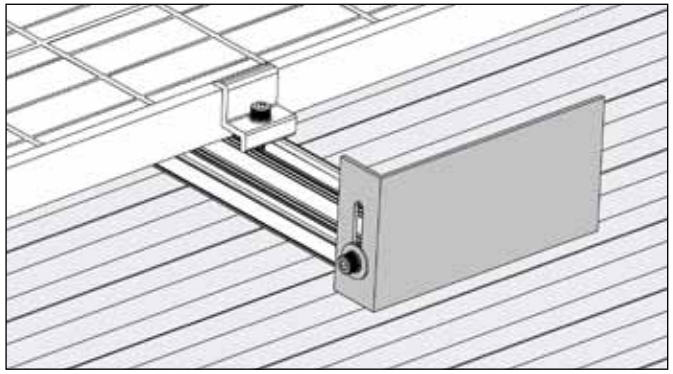
Finish the array row by securing the remaining two end clamps. You should have a minimum of 50 mm clearance between the edge of the last panel and the end of the rail. Tighten all bolts to secure the panels.



11. EarthLock Bonding Terminal

Fasten the EarthLock Bonding Terminal directly to a SunLock rail by placing the insert key in the rail and tightening the cap screw.

Note: The SLELBT02 can be connected to the top or the side of the rail.



12. Isolator mounting bracket

Fasten the Isolator Mounting Bracket to the end of the SunLock rail. The DC isolator can then be fixed to this plate.

WARRANTY AGAINST DEFECTS

Energy Matters Pty Ltd (trading as Energy Matters and Apollo Energy) (**Energy Matters**) is the manufacturer of the Sunlock Solar Module Mounting System (**Frame**).

Energy Matters warrants, on the terms set out below, that the Frame will be free from defects in materials and workmanship for a period of 10 years from the date on which the Frame is purchased from Energy Matters (**Warranty against Defects**).

Transferability

Our Warranty against Defects is only provided to the original purchaser of the Frame from Energy Matters (**Purchaser**) or, where the Purchaser is an installer or builder who on-supplies the Frame to another party, to that other party (**End-User**). Our Warranty against Defects is not otherwise transferable.

Making a claim

If you believe that the Frame is defective and you are an End-User, you may either make a claim against the installer or builder from whom you purchased the Frame or you may make a claim against us directly.

In order to make a claim against us, you must post, fax or email us a notice, using the contact details set out below. In your notice you must provide:

- details of why you believe the Frame is defective;
- a copy of your invoice, receipt or any other document which provides proof of purchase;
- details of any expenses you have incurred in making your claim; and
- details of how we should contact you.

Within a reasonable time after receipt of your claim we will contact you to arrange a time to attend the premises at which the Frame is located.

Remedies

If we determine that the Frame is defective and the defect is not a major failure then, if possible, we will try to repair the defective Frame at the premises. If this is not possible, we will remove the defective Frame and provide a replacement Frame at our expense.

If we determine that the Frame is defective and the defect is a is major failure then you have the option of rejecting the Frame and obtaining a refund from us, rejecting the Frame and obtaining a replacement Frame from us at our expense or of keeping the Frame and receiving compensation from us for the difference between the actual value of the Frame and the amount you paid for the Frame.

If we determine that the Frame is defective we will also pay the substantiated reasonable expenses incurred by you in making your claim.

Your obligations

In order to have the benefit of our Warranty against Defects:

- if you are a Purchaser, you must have paid all amounts owed by you to Energy Matters in relation to the purchase of the Frame;
- you must have complied with all reasonable instructions of Energy Matters (whether written or verbal) in relation to the transport, installation, care, repair and use of the Frame; and
- you must not have misused, neglected, damaged or modified the Frame.

Exclusions

Our Warranty against Defects does not include:

- damage caused to the Frame during shipment or storage of the Frame by a party other than Energy Matters;
- damage caused to the Frame during installation by a party other than Energy Matters;
- damage caused by 'Acts of God', vermin, animals or pests or by other causes or acts outside Energy Matters' reasonable control; or
- normal wear and tear, including normal weathering.

Jurisdiction

Our Warranty against Defects is to be construed in accordance with the laws of Victoria and any disputes will be determined by the exclusive jurisdiction of the courts of Victoria.

CONSUMER GUARANTEES

In addition to our Warranty against Defects, the Frame also comes with guarantees that cannot be excluded under the Australian Consumer Law (**Consumer Guarantees**).

In the event that the Frame fails to satisfy a Consumer Guarantee, you are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Frame repaired or replaced if the Frame fails to be of acceptable quality and the failure does not amount to a major failure.

Please note that in addition to the rights and remedies set out in this document, you may also have other rights and remedies available to you under the law.

CONTACT DETAILS

Energy Matters Pty Ltd (trading as Energy Matters and Apollo Energy)

Address: Level 2, 101-105 Clarke Street,
South Melbourne, VIC, 3205

Postal Address: PO Box 5265,
South Melbourne, VIC, 3205

Sales and Service:

1300 855 484 (local call from anywhere in Australia)

International: +61 3 9697 1990

Fax: +61 3 9697 1919

Email: sunlock@apolloenergy.com.au

MAINTENANCE AND CLEANING

6106-T6 aluminium is largely maintenance free. Only in highly polluted or marine conditions is rinsing with clean water required, during scheduled panel cleaning.

REFERENCES

AS/NZS1170.2:2011 on wind actions

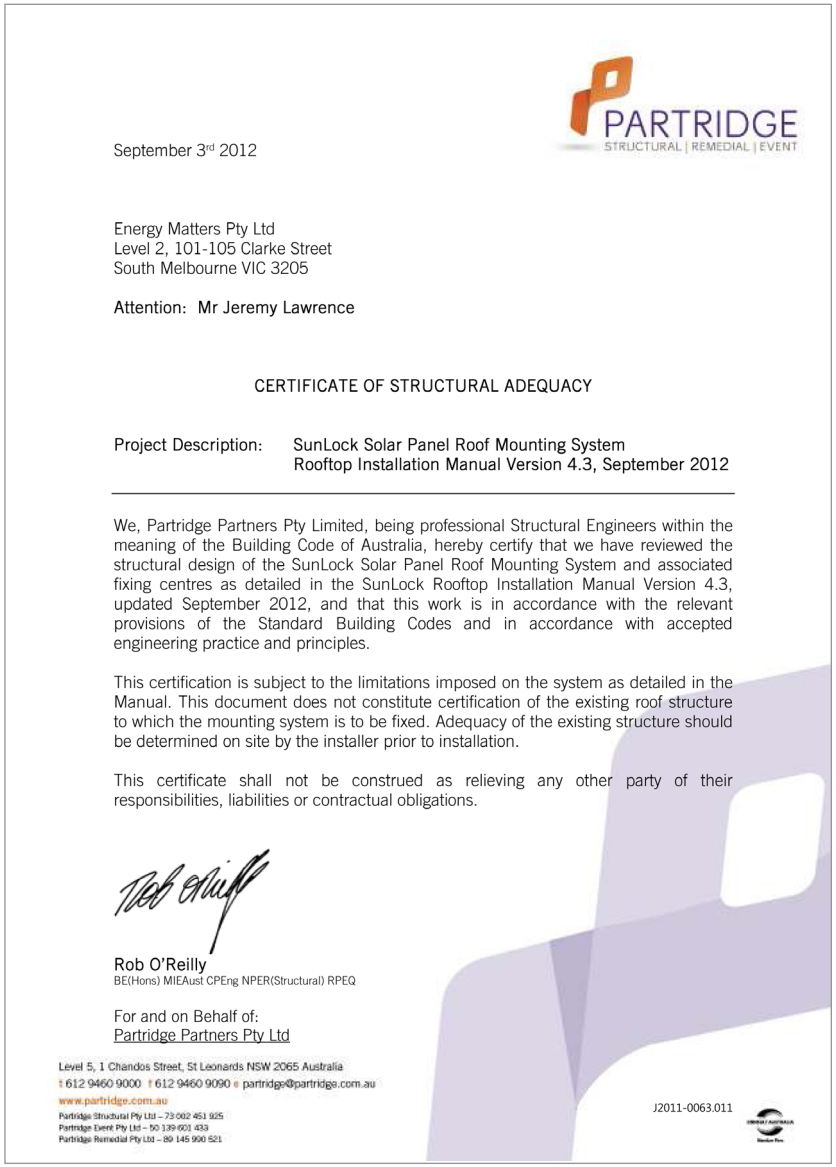
AS/NZS16641.1:1997 on aluminium structures

AS1720.1:2012 on timber structures

AS/NZS4600:2005 on cold-formed steel structures

AS3566-2011, self-drilling screws for the building and construction industries.

CERTIFICATE OF COMPLIANCE



PARTRIDGE
STRUCTURAL | REMEDIAL | EVENT

September 3rd 2012

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
Rooftop Installation Manual Version 4.3, September 2012

We, Partridge Partners 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 and associated fixing centres as detailed in the SunLock Rooftop Installation Manual Version 4.3, updated September 2012, 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.

This certification is subject to the limitations imposed on the system as detailed in the Manual. 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.

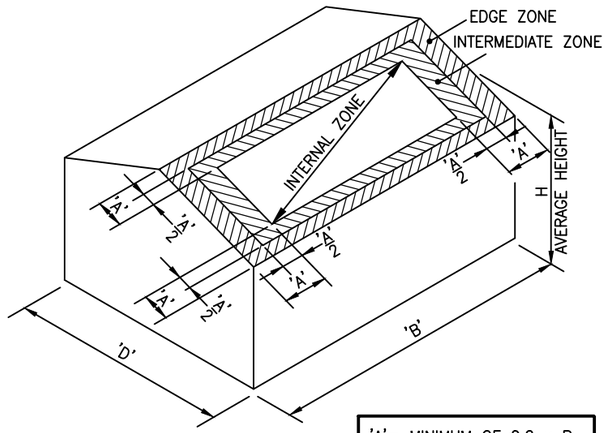
This certificate shall not be construed as relieving any other party of their responsibilities, liabilities or contractual obligations.

Rob O'Reilly
BE(Hons) MIEAust CPEng NPER(Structural) RPEQ

For and on Behalf of:
Partridge Partners Pty Ltd

Level 5, 1 Chandos Street, St Leonards NSW 2065 Australia
t 612 9460 9000 f 612 9460 9090 e partridge@partridge.com.au
www.partridge.com.au
Partridge Structural Pty Ltd – 73 002 461 925
Partridge Event Pty Ltd – 50 139 603 433
Partridge Remedial Pty Ltd – 89 145 990 521

J2011-0063.011

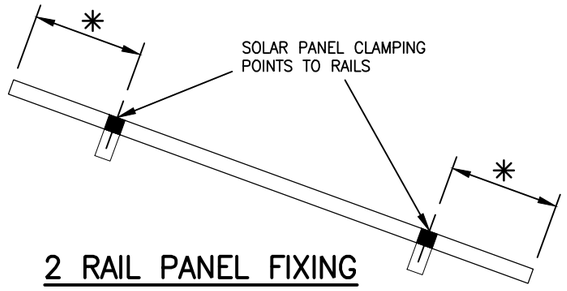


'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

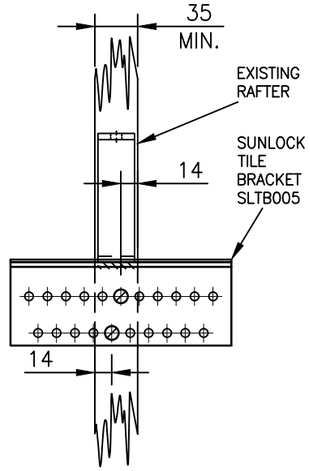
TILED ROOF – INSTALLATION ZONES

NOT TO SCALE

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	2	675	420
	3	850	530
INTERMEDIATE ZONE	2	450	280
	3	560	345
EDGE ZONE	2	335	205
	3	420	260

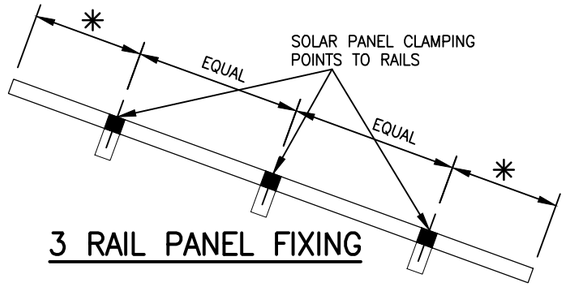


2 RAIL PANEL FIXING

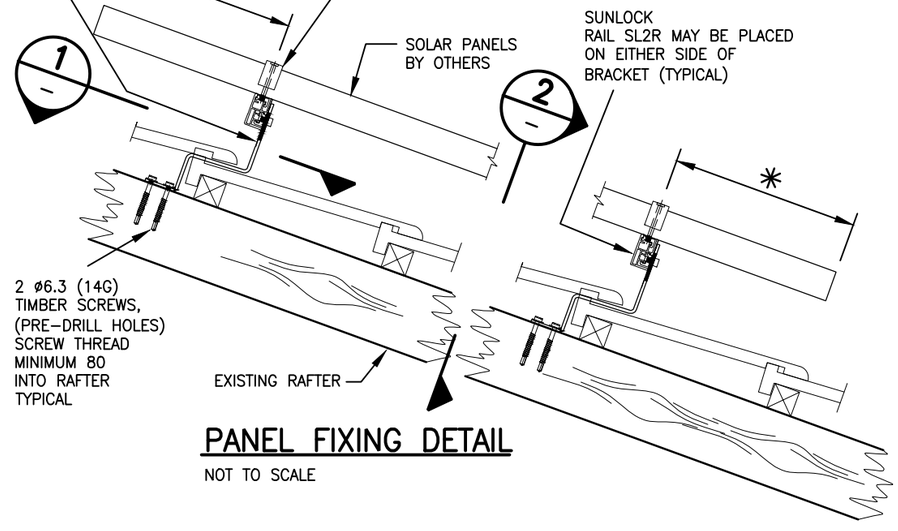


SECTION 1 – NOT TO SCALE

* CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL

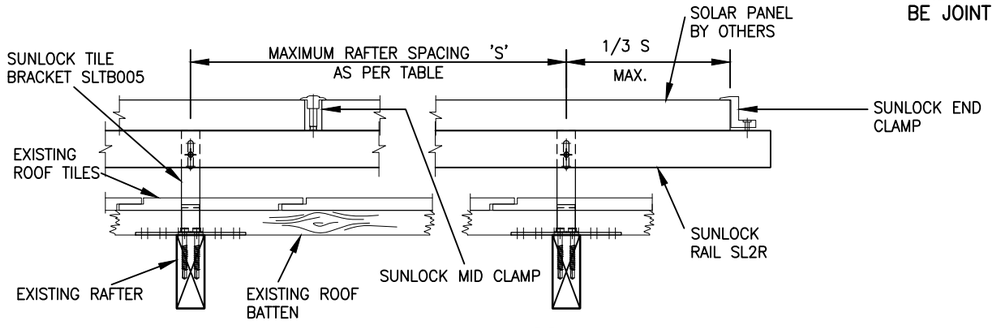


3 RAIL PANEL FIXING



PANEL FIXING DETAIL

NOT TO SCALE



SECTION 2 – NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK FOR 10° – 20° TILED ROOFS
- PORTRAIT MOUNTED PANELS
- SUNLOCK TILE BRACKET

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 10° ROOF PITCH
- MAXIMUM 20° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER TILE BRACKET 1.03kN
- TIMBER RAFTERS TO SUPPORT FRAME TO BE JOINT GROUP J4 OR BETTER

APPROVED FOR CONSTRUCTION

THIS DRAWING HAS BEEN ASSIGNED AN ELECTRONIC SIGNATURE CODE. THE PRESENCE OF THIS CODE SIGNIFIES THAT THIS IS THE CERTIFIED DRAWING ISSUED FOR CONSTRUCTION.

ACEA COVER OF EXCELLENCE — Liability limited by a scheme approved under Professional Standards Legislation

No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O.	30.08.11
B	GENERAL REVISIONS	R.O.	31.10.11
C	RAFTER SPACING AMENDED	R.O.	18.11.11
D	WIND REGION A AMENDED	R.O.	09.12.11
E	GENERAL AMENDMENTS	R.O.	29.06.12
F	BRACKET AMENDED	R.O.	31.08.12

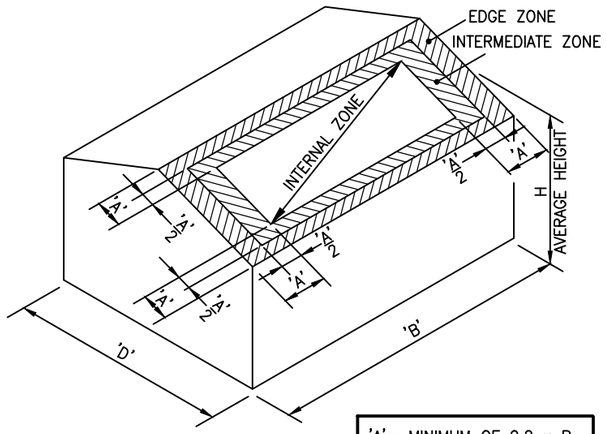
Partridge Partners
Structural Engineers
Domestic Commercial
Facade Forensic Events
Level 4, 1 Chandos Street,
St Leonards NSW 2065
Tel 9460 9000
Email: partridge@partridge.com.au
Web: www.partridge.com.au

Client: ENERGY MATTERS PTY LTD

SUNLOCK
MOUNTING SYSTEM AND FIXINGS

TILED ROOF 10° – 20° PITCH
TIMBER ROOF STRUCTURE

Electronic Code: R074427	Signature Date: 31.08.12
Design: R.H	Drawn: IGS
Scale at A3: N/A	Date: AUG 2011
Job No.: 2011.0063	Drg. No.: S1 F

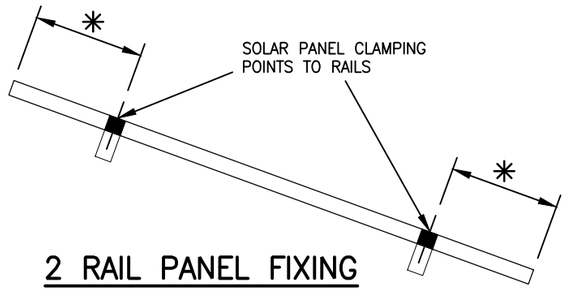


'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

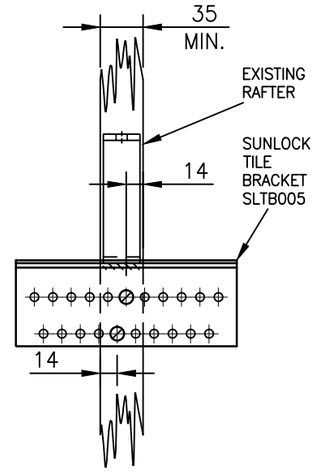
TILED ROOF – INSTALLATION ZONES

NOT TO SCALE

MAXIMUM RAFTER SPACING 'S' IN mm, FOR TILED ROOFS OF PITCH 20°–35°			
LOCATION	No OF RAILS	WIND REGION A	WIND REGION B
INTERNAL ZONE	2	1260	780
	3	1580	980
INTERMEDIATE ZONE	2	835	520
	3	1050	655
EDGE ZONE	2	630	390
	3	780	490

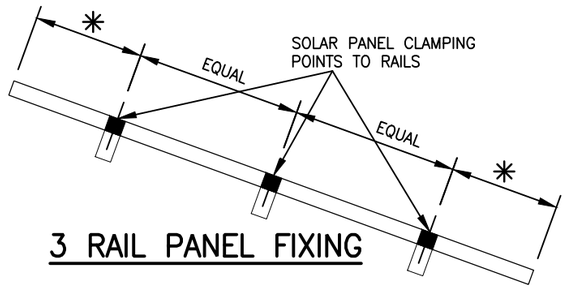


2 RAIL PANEL FIXING

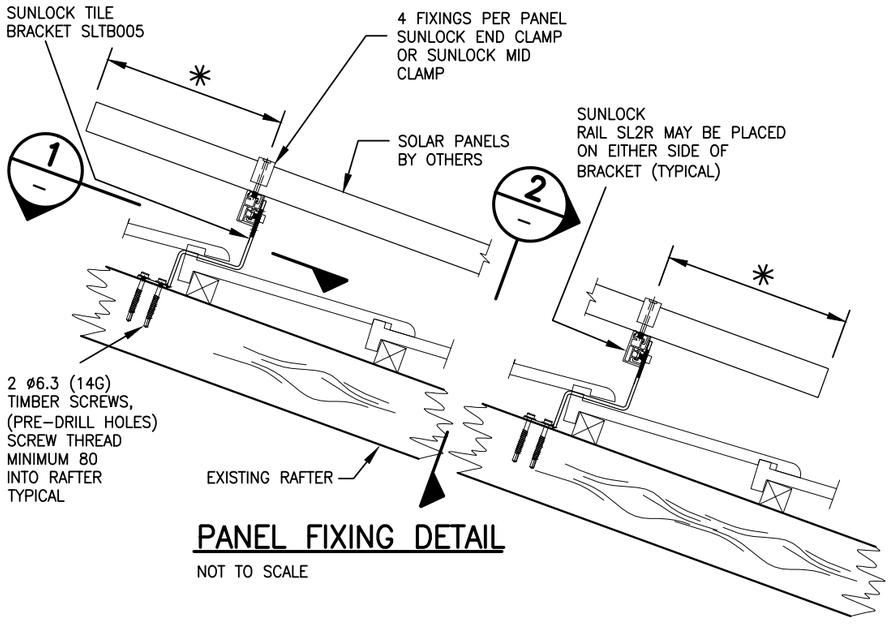


SECTION 1 – NOT TO SCALE

✳ CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL

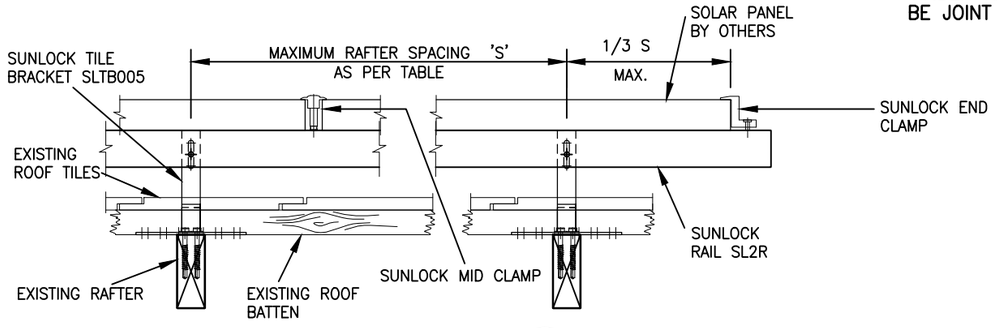


3 RAIL PANEL FIXING



PANEL FIXING DETAIL

NOT TO SCALE



SECTION 2 – NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK FOR 20° – 35° TILED ROOFS
- PORTRAIT MOUNTED PANELS
- SUNLOCK TILE BRACKET

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.**
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- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 20° ROOF PITCH
- MAXIMUM 35° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER TILE BRACKET 1.03kN
- TIMBER RAFTERS TO SUPPORT FRAME TO BE JOINT GROUP J4 OR BETTER

APPROVED FOR CONSTRUCTION

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ACEA COVER OF EXCELLENCE — Liability limited by a scheme approved under Professional Standards Legislation

No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O..	30.08.11
B	GENERAL REVISIONS	R.O..	31.10.11
C	RAFTER SPACING AMENDED	R.O..	18.11.11
D	WIND REGION A & B AMENDED	R.O..	09.12.11
E	GENERAL AMENDMENTS	R.O..	29.06.12
F	BRACKET AMENDED	R.O..	31.08.12

Partridge Partners
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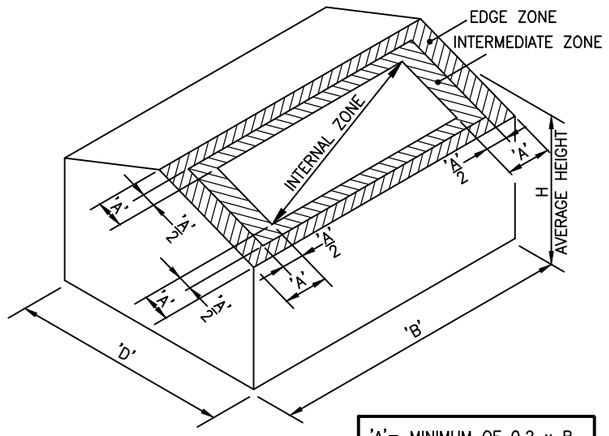
Web: www.partridge.com.au

Client: ENERGY MATTERS PTY LTD

SUNLOCK
MOUNTING SYSTEM AND FIXINGS
TILED ROOF 20° – 35° PITCH
TIMBER ROOF STRUCTURE

Electronic Code: R074427	Signature Date: 31.08.12
Design: R.H	Drawn: IGS
Scale at A3: N/A	Date: AUG 2011
Job No.: 2011.0063	Drg. No.: S2 F



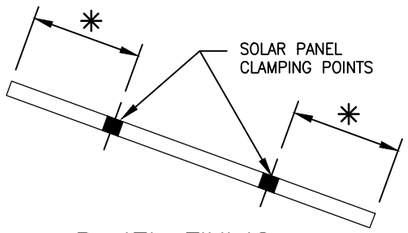
'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

METAL SHEETED ROOF – INSTALLATION ZONES

NOT TO SCALE

MAXIMUM L–FOOT SPACING IN mm FOR STEEL BATTENS/PURLINS, FOR SHEETED ROOFS OF PITCH 10°–20°

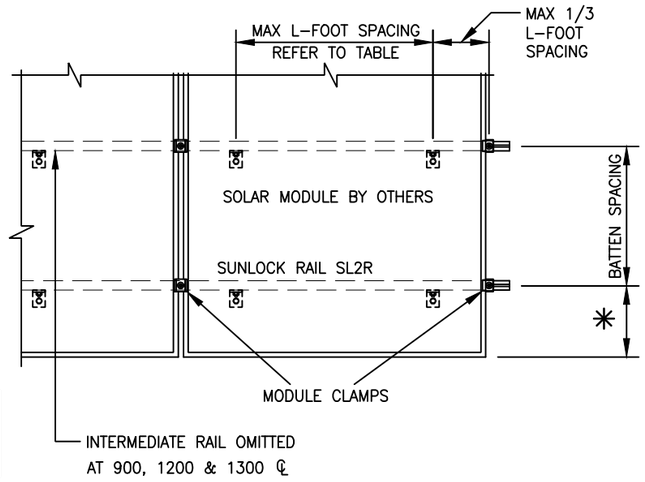
		WIND REGIONS			
ROOF ZONE	BATTEN SPACING	A	B	C	D
INTERNAL ZONE	600	1100	690	280	170
	900, 1200, 1300	730	455	185	115
INTERMEDIATE ZONE	600	735	460	185	115
	900, 1200, 1300	485	305	125	75
EDGE ZONE	600	550	345	140	85
	900, 1200, 1300	365	230	90	55



PANEL FIXING

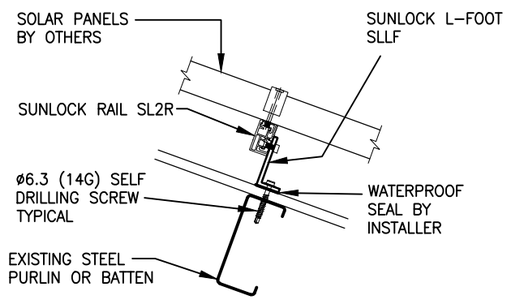
NOT TO SCALE

✳ CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL



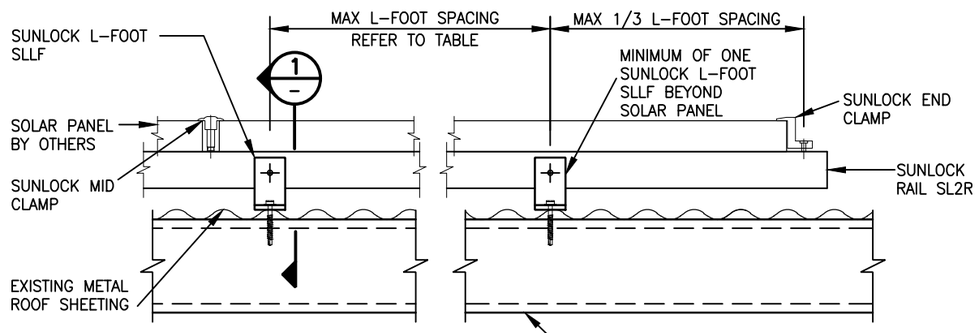
PLAN ON SOLAR PANELS

NOT TO SCALE



SECTION 1 –

NOT TO SCALE



L–FOOT FIXING

NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK
- FOR 10° – 20° METAL SHEETED ROOFS
- PORTRAIT MOUNTED PANELS

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

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- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s
- REGION C; VR = 69 m/s
- REGION D; VR = 88 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 10° ROOF PITCH
- MAXIMUM 20° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER FOOTING BRACKET 1.05kN IN NON CYCLONIC REGIONS, 0.63kN IN CYCLONIC REGIONS.
- MINIMUM STEEL BATTEN OR PURLIN THICKNESS 0.75mm GRADE 550

APPROVED FOR CONSTRUCTION

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D	GENERAL AMENDMENTS	R.O.	31.08.12

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St Leonards NSW 2065
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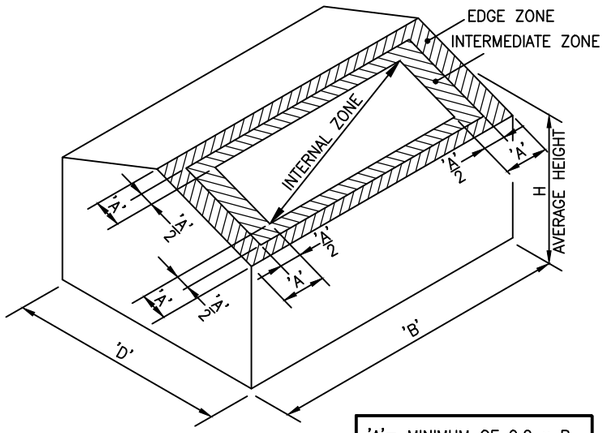
Email: partridge@partridge.com.au
Web: www.partridge.com.au

Client: ENERGY MATTERS PTY LTD

SUNLOCK
MOUNTING SYSTEM AND FIXINGS
SHEETED ROOF AT 10° TO 20° PITCH
STEEL ROOF STRUCTURE

Electronic Code: R074427	Signature Date: 31.08.12
Design: R.H	Drawn: IGS
Scale at A3: N/A	Date: AUG 2011
Job No.: 2011.0063	Drg. No.: S3 D

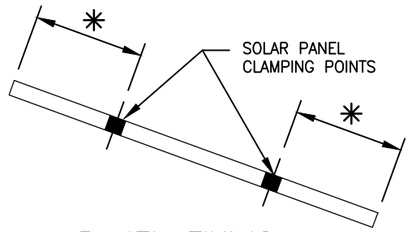


'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

METAL SHEETED ROOF – INSTALLATION ZONES

NOT TO SCALE

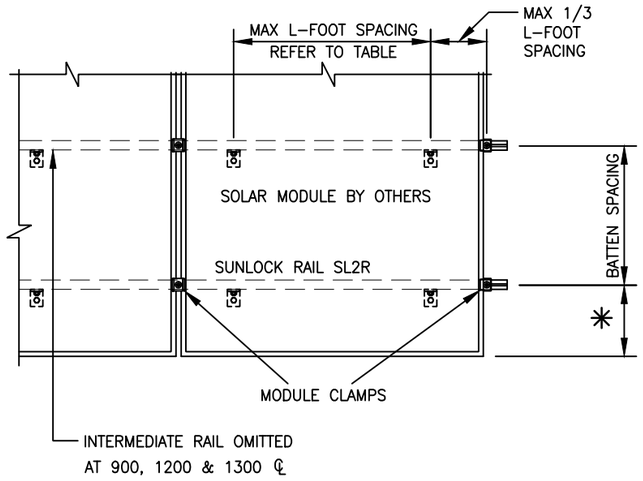
MAXIMUM L–FOOT SPACING IN mm FOR STEEL BATTENS/PURLINS, FOR SHEETED ROOFS OF PITCH 20°–35°					
		WIND REGIONS			
ROOF ZONE	BATTEN SPACING	A	B	C	D
INTERNAL ZONE	600	1800	1280	520	320
	900, 1200, 1300	1360	850	345	215
INTERMEDIATE ZONE	600	1370	855	345	215
	900, 1200, 1300	905	565	230	140
EDGE ZONE	600	1025	640	260	160
	900, 1200, 1300	680	420	170	105



PANEL FIXING

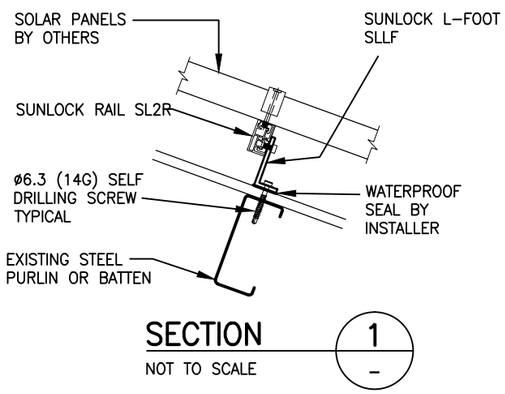
NOT TO SCALE

✳ CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL



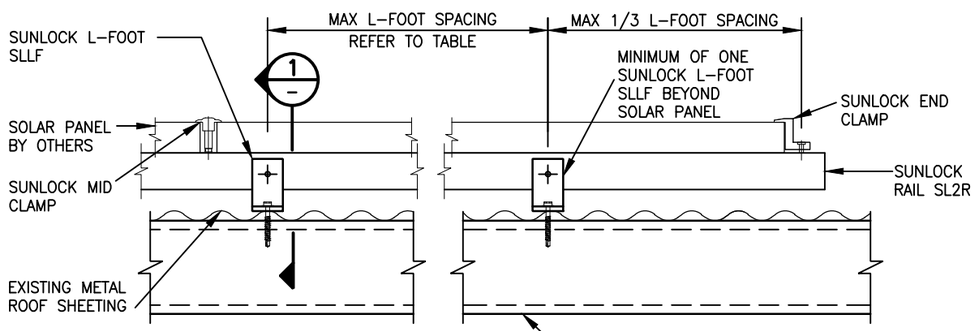
PLAN ON SOLAR PANELS

NOT TO SCALE



SECTION 1 –

NOT TO SCALE



L–FOOT FIXING

NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK
- FOR 20° – 35° METAL SHEETED ROOFS
- PORTRAIT MOUNTED PANELS

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s
- REGION C; VR = 69 m/s
- REGION D; VR = 88 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 20° ROOF PITCH
- MAXIMUM 35° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER FOOTING BRACKET 1.05kN IN NON CYCLONIC REGIONS, 0.63kN IN CYCLONIC REGIONS.
- MINIMUM STEEL BATTEN OR PURLIN THICKNESS 0.75mm GRADE 550

APPROVED FOR CONSTRUCTION

THIS DRAWING HAS BEEN ASSIGNED AN ELECTRONIC SIGNATURE CODE. THE PRESENCE OF THIS CODE SIGNIFIES THAT THIS IS THE CERTIFIED DRAWING ISSUED FOR CONSTRUCTION.

No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O.	30.08.11
B	GENERAL REVISIONS	R.O.	31.10.11
C	GENERAL AMENDMENTS	R.O.	29.06.12
D	GENERAL AMENDMENTS	R.O.	31.08.12

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Level 4, 1 Chandos Street,
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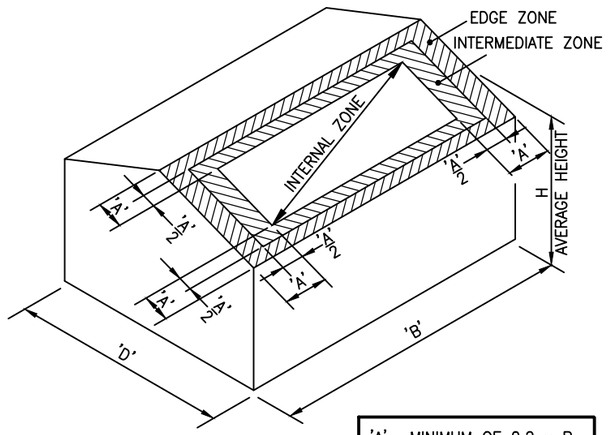
Tel 9460 9000
Email: partridge@partridge.com.au
Web: www.partridge.com.au

Client: ENERGY MATTERS PTY LTD

SUNLOCK
MOUNTING SYSTEM AND FIXINGS

SHEETED ROOF AT 20° TO 35° PITCH
STEEL ROOF STRUCTURE

Electronic Code	Signature Date
R074427	31.08.12
Design: R.H	Drawn: IGS
Scale at A3: N/A	Date: AUG 2011
Job No.: 2011.0063	Drg. No.: S4 D

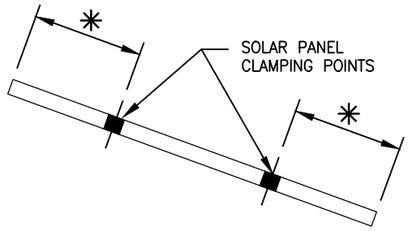


'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

METAL SHEETED ROOF – INSTALLATION ZONES

NOT TO SCALE

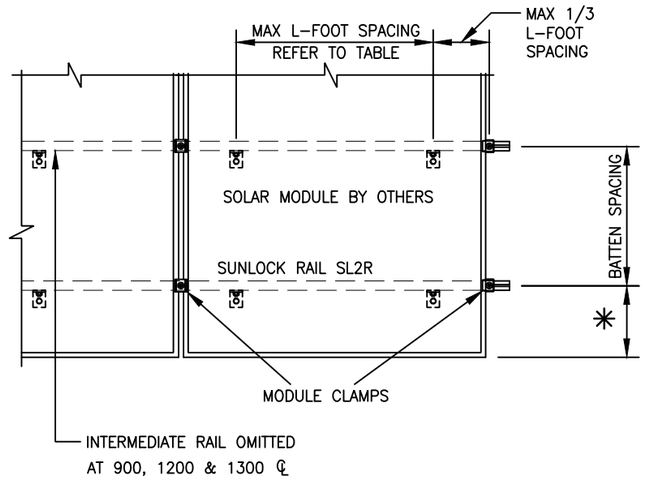
MAXIMUM L–FOOT SPACING IN mm FOR TIMBER BATTENS/PURLINS FOR SHEETED ROOFS OF PITCH 10°–20°					
		WIND REGIONS			
ROOF ZONE	BATTEN SPACING	A	B	C	D
INTERNAL ZONE	600	1520	1050	700	440
	900, 1200, 1300	1100	695	470	290
INTERMEDIATE ZONE	600	1120	700	470	290
	900, 1200, 1300	745	465	315	195
EDGE ZONE	600	840	520	350	220
	900, 1200, 1300	555	350	235	145



✳ CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL

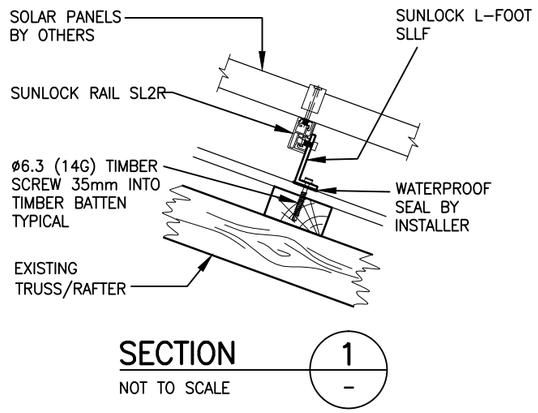
PANEL FIXING

NOT TO SCALE



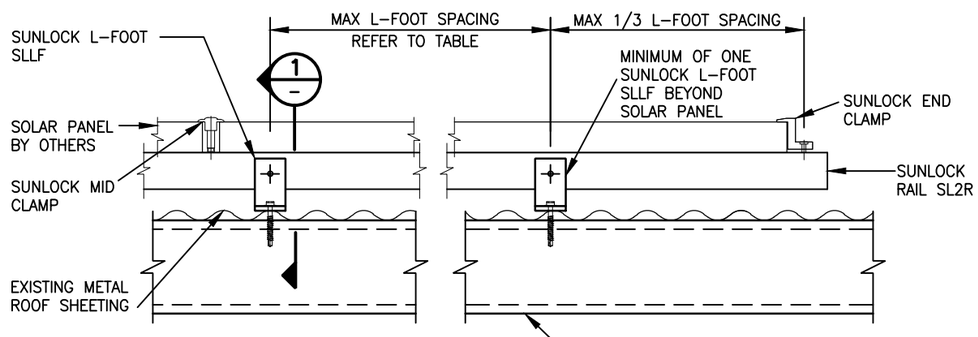
PLAN ON SOLAR PANELS

NOT TO SCALE



SECTION 1 –

NOT TO SCALE



L–FOOT FIXING

NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK
- FOR 10° – 20° METAL SHEETED ROOFS
- PORTRAIT MOUNTED PANELS

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s
- REGION C; VR = 69 m/s
- REGION D; VR = 88 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 10° ROOF PITCH
- MAXIMUM 20° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER FOOTING BRACKET 1.6kN
- TIMBER BATTENS OR PURLINS TO SUPPORT FRAME TO BE JOINT GROUP J4 OR BETTER

APPROVED FOR CONSTRUCTION

THIS DRAWING HAS BEEN ASSIGNED AN ELECTRONIC SIGNATURE CODE. THE PRESENCE OF THIS CODE SIGNIFIES THAT THIS IS THE CERTIFIED DRAWING ISSUED FOR CONSTRUCTION.

No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O.	30.08.11
B	GENERAL REVISIONS	R.O.	31.10.11
C	GENERAL AMENDMENTS	R.O.	29.06.12
D	GENERAL AMENDMENTS	R.O.	31.08.12

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Level 4, 1 Chandos Street,
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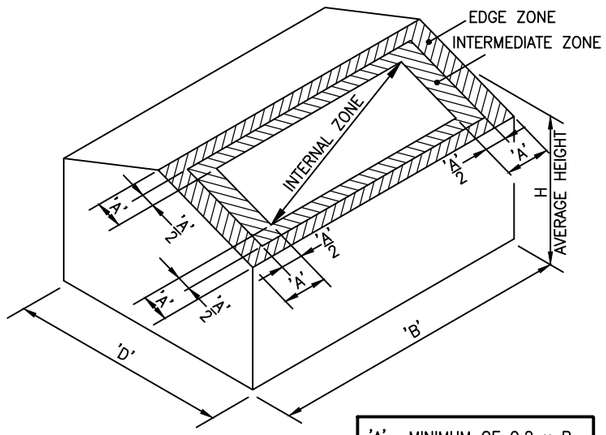
Tel 9460 9000
Email: partridge@partridge.com.au
Web: www.partridge.com.au

Client: ENERGY MATTERS PTY LTD

SUNLOCK
MOUNTING SYSTEM AND FIXINGS
SHEETED ROOF AT 10° TO 20° PITCH
TIMBER ROOF STRUCTURE

Electronic Code	Signature Date
R074427	31.08.12
Design: R.H	Drawn: IGS
Scale at A3: N/A	Date: AUG 2011
Job No.: 2011.0063	Drg. No.: S5 D



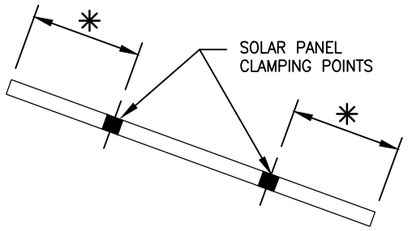
'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

METAL SHEETED ROOF – INSTALLATION ZONES

NOT TO SCALE

MAXIMUM L–FOOT SPACING IN mm FOR TIMBER BATTENS/PURLINS, FOR SHEETED ROOFS OF PITCH 20°–35°

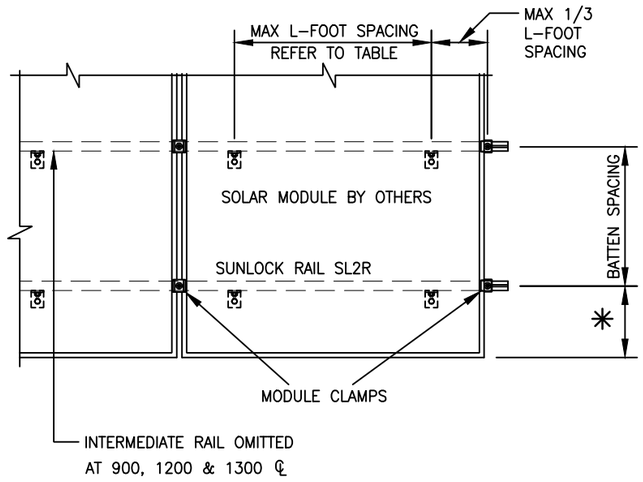
		WIND REGIONS			
ROOF ZONE	BATTEN SPACING	A	B	C	D
INTERNAL ZONE	600	1870	1840	1330	815
	900, 1200, 1300	1635	1300	875	545
INTERMEDIATE ZONE	600	1635	1300	880	545
	900, 1200, 1300	1380	865	580	360
EDGE ZONE	600	1485	970	665	400
	900, 1200, 1300	1035	650	435	270



✳ CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL

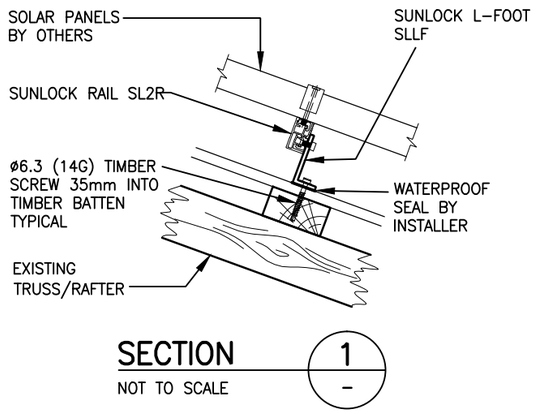
PANEL FIXING

NOT TO SCALE



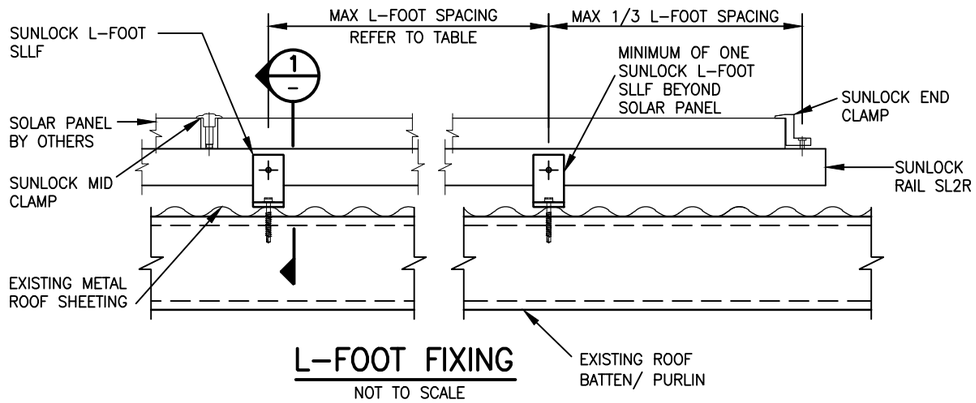
PLAN ON SOLAR PANELS

NOT TO SCALE



SECTION 1 –

NOT TO SCALE



L–FOOT FIXING

NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK
- FOR 20° – 35° METAL SHEETED ROOFS
- PORTRAIT MOUNTED PANELS

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s
- REGION C; VR = 69 m/s
- REGION D; VR = 88 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 20° ROOF PITCH
- MAXIMUM 35° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER FOOTING BRACKET 1.6kN
- TIMBER BATTENS OR PURLINS TO SUPPORT FRAME TO BE JOINT GROUP J4 OR BETTER

APPROVED FOR CONSTRUCTION

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No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O.	30.08.11
B	GENERAL REVISIONS	R.O.	31.10.11
C	GENERAL AMENDMENTS	R.O.	29.06.12
D	GENERAL AMENDMENTS	R.O.	31.08.12

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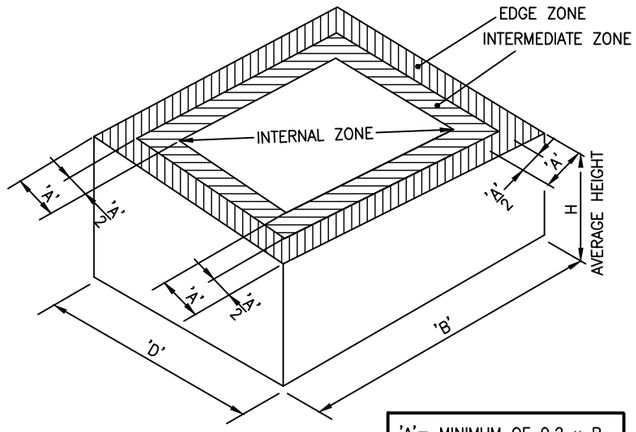
Level 4, 1 Chandos Street,
St Leonards NSW 2065
Tel 9460 9000
Email: partridge@partridge.com.au
Web: www.partridge.com.au

Client: ENERGY MATTERS PTY LTD	Electronic Code: RO74427 / Signature Date: 31.08.12
SUNLOCK MOUNTING SYSTEM AND FIXINGS	Design: R.H / Drawn: IGS
	Scale at A3: N/A / Date: AUG 2011
SHEETED ROOF AT 20° TO 35° PITCH TIMBER ROOF STRUCTURE	Job No.: 2011.0063 / Drg. No.: S6 D



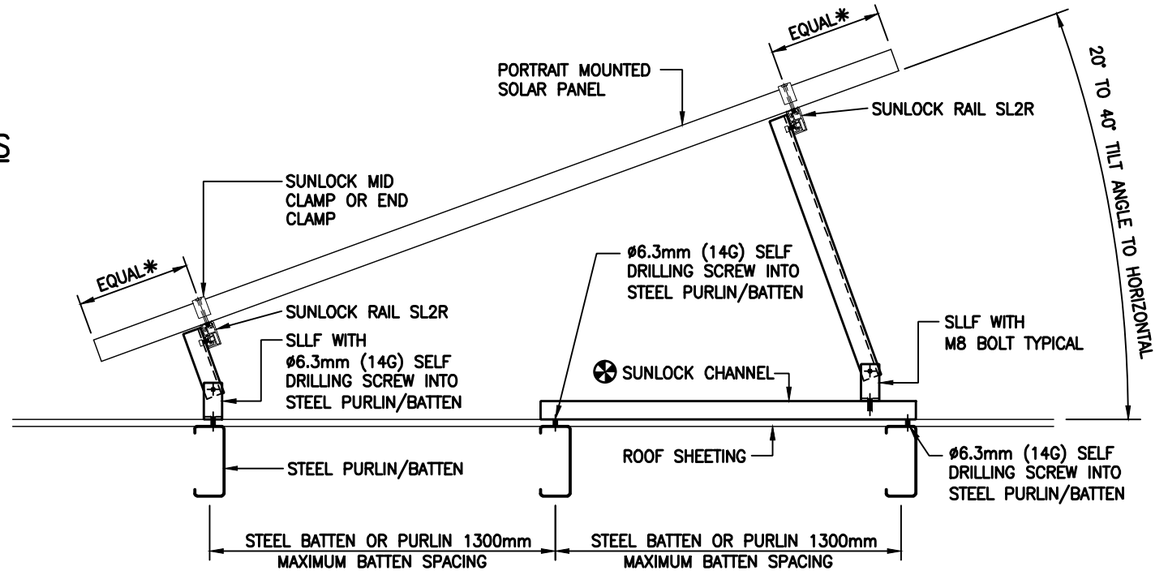
'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

METAL SHEETED ROOF – INSTALLATION ZONES

NOT TO SCALE

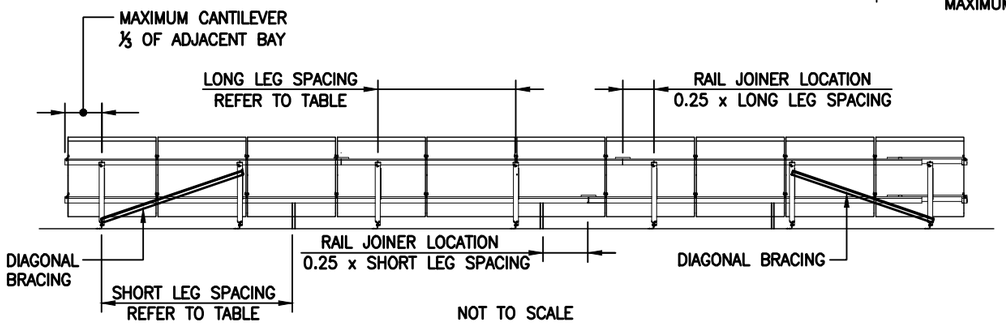
MAXIMUM L–FOOT SPACING IN mm FOR STEEL BATTENS/PURLINS					
WIND REGION		A	B	C	D
INTERNAL ZONE	SHORT LEG	1075	675	270	170
	LONG LEG	655	410	165	105
INTERMEDIATE ZONE	SHORT LEG	715	450	180	110
	LONG LEG	435	275	110	70
EDGE ZONE	SHORT LEG	535	335	135	85
	LONG LEG	325	205	85	50

✳ EQUAL CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL



DETAIL 1 – NOT TO SCALE

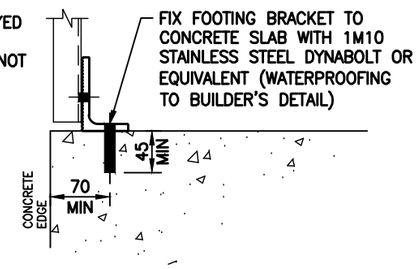
✳ NOTE: SUNLOCK CHANNEL TO BE EMPLOYED WHEN TILT ANGLE AND EXISTING PURLIN SPACING DICTATE THAT REAR LEG DOES NOT COINCIDE WITH A PURLIN



NOT TO SCALE

SUNLOCK REAR FRAMING ELEVATION

NOTE: PROVIDE SLDB1200 40 x 3 FLAT; ALUMINIUM DIAGONAL BRACE TO EACH END BAY



ALTERNATIVE CONCRETE FIXING DETAIL

SCALE 1:5

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL TILTED FRAME AND FIXINGS FOR SUNLOCK
- FOR 20° – 40° FRAME TILT ANGLES
- PORTRAIT MOUNTED PANELS

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s
- REGION C; VR = 69 m/s
- REGION D; VR = 88 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED BY A SUITABLY QUALIFIED STRUCTURAL ENGINEER TO ENSURE THAT IT CAN SUPPORT THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MAXIMUM 10° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- MAX ULTIMATE UP–LIFT FORCE PER FOOTING BRACKET 1.05kN IN NON CYCLONIC REGIONS, 0.63kN IN CYCLONIC REGIONS.
- MINIMUM STEEL BATTEN OR PURLIN THICKNESS 0.75mm GRADE 550

APPROVED FOR CONSTRUCTION

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ACEA COVER OF EXCELLENCE — Liability limited by a scheme approved under Professional Standards Legislation

No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O.	7.10.11
B	GENERAL REVISIONS	R.O.	31.10.11
C	RE–ISSUED FOR CONSTRUCTION	R.O.	20.02.12
D	GENERAL AMENDMENTS	R.O.	29.06.12

Partridge Partners
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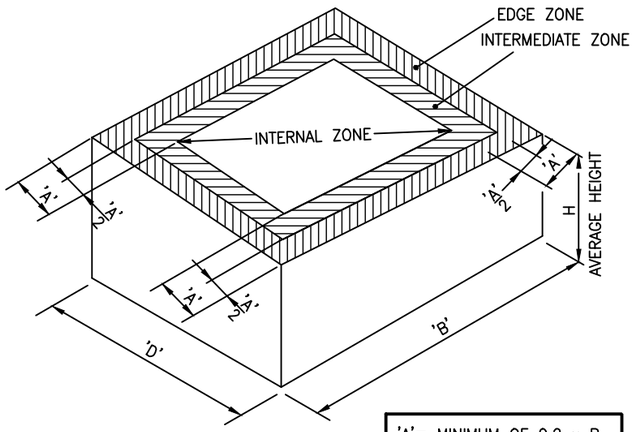
Level 4, 1 Chandos Street,
St Leonards NSW 2065
Tel 9460 9000
Email: partridge@partridge.com.au
Web: www.partridge.com.au

Client: ENERGY MATTERS PTY LTD	Electronic Code: R077345	Signature Date: 29.06.12
SUNLOCK MOUNTING SYSTEM AND FIXINGS	Design: R.H	Drawn: IGS
	Scale at A3: N/A	Date: AUG 2011
SHEETED ROOF AT MAXIMUM 10° PITCH STEEL ROOF STRUCTURE	Job No.: 2011.0063	Drg. No.: S7 D



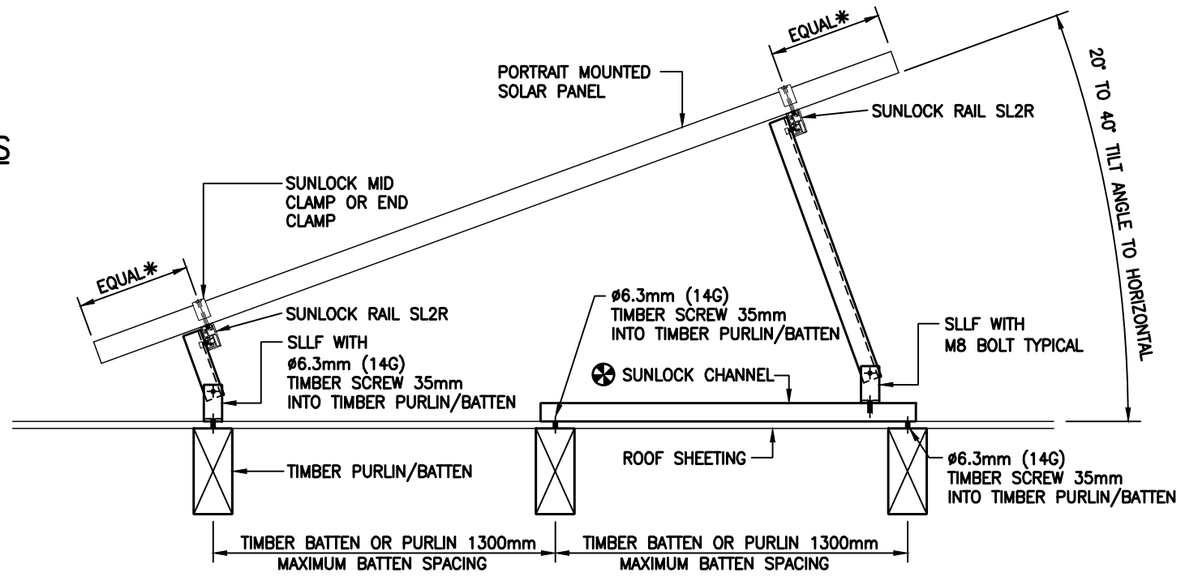
'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

METAL SHEETED ROOF – INSTALLATION ZONES

NOT TO SCALE

MAXIMUM L–FOOT SPACING IN mm FOR TIMBER BATTENS/PURLINS					
WIND REGION		A	B	C	D
INTERNAL ZONE	SHORT LEG	1270	1025	690	430
	LONG LEG	1000	625	420	260
INTERMEDIATE ZONE	SHORT LEG	1090	685	460	285
	LONG LEG	665	415	280	175
EDGE ZONE	SHORT LEG	820	510	345	215
	LONG LEG	500	310	210	130

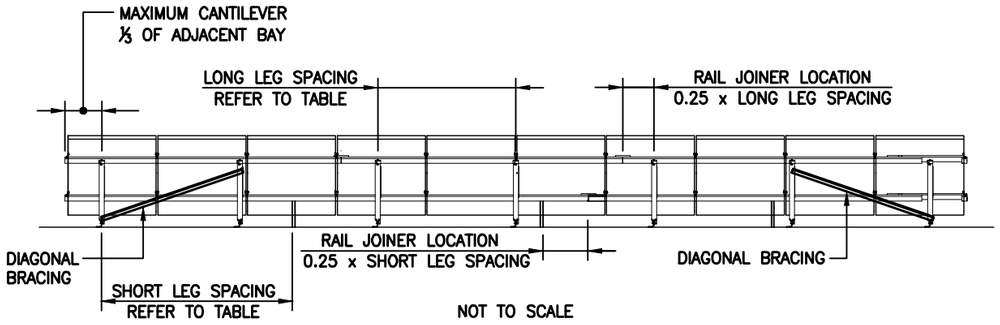
✳ EQUAL CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL



DETAIL 1

NOT TO SCALE

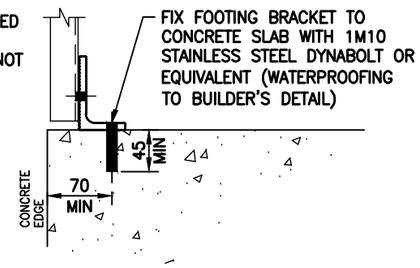
✳ NOTE: SUNLOCK CHANNEL TO BE EMPLOYED WHEN TILT ANGLE AND EXISTING PURLIN SPACING DICTATE THAT REAR LEG DOES NOT COINCIDE WITH A PURLIN



NOT TO SCALE

SUNLOCK REAR FRAMING ELEVATION

NOTE: PROVIDE SLDB1200 40 x 3 FLAT; ALUMINIUM DIAGONAL BRACE TO EACH END BAY



ALTERNATIVE CONCRETE FIXING DETAIL

SCALE 1:5

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL TILTED FRAME AND FIXINGS FOR SUNLOCK
- FOR 20° – 40° FRAME TILT ANGLES
- PORTRAIT MOUNTED PANELS

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 2; Mz,CAT = 1.0
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s
- REGION C; VR = 69 m/s
- REGION D; VR = 88 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED BY A SUITABLY QUALIFIED STRUCTURAL ENGINEER TO ENSURE THAT IT CAN SUPPORT THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MAXIMUM 10° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- MAX ULTIMATE UP–LIFT FORCE PER FOOTING BRACKET 1.6kN
- TIMBER BATTENS OR PURLINS TO SUPPORT FRAME TO BE JOINT GROUP J4 OR BETTER

APPROVED FOR CONSTRUCTION

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ACEA COVER OF EXCELLENCE — Liability limited by a scheme approved under Professional Standards Legislation

No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O.	7.10.11
B	GENERAL REVISIONS	R.O.	31.10.11
C	GENERAL AMENDEMENTS	R.O.	09.12.11
D	RE–ISSUED FOR CONSTRUCTION	R.O.	21.02.12
E	GENERAL AMENDMENTS	R.O.	29.06.12

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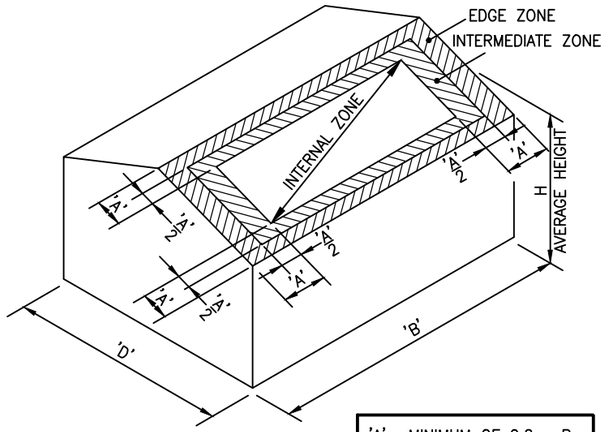
Client: ENERGY MATTERS PTY LTD	Electronic Code: R077345	Signature Date: 29.06.12
SUNLOCK MOUNTING SYSTEM AND FIXINGS	Design: R.H	Drawn: IGS
	Scale at A3: N/A	Date: AUG 2011
SHEETED ROOF AT MAXIMUM 10° PITCH TIMBER ROOF STRUCTURE	Job No.: 2011.0063	Drg. No.: S8 E

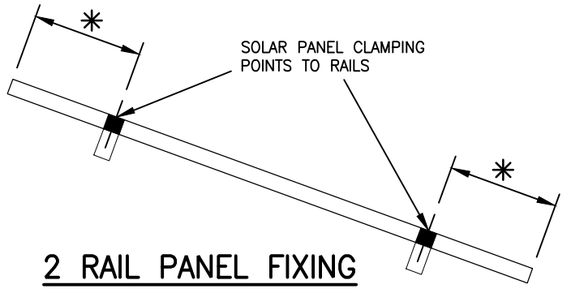


'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

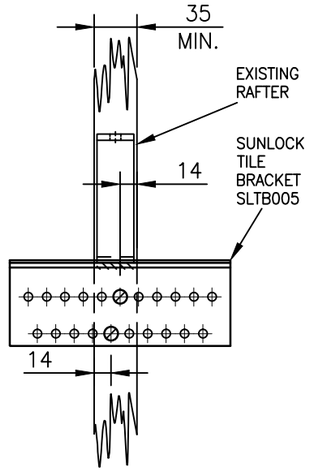
TILED ROOF – INSTALLATION ZONES

NOT TO SCALE

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	2	985	615
	3	1230	770
INTERMEDIATE ZONE	2	655	410
	3	815	505
EDGE ZONE	2	490	305
	3	615	380

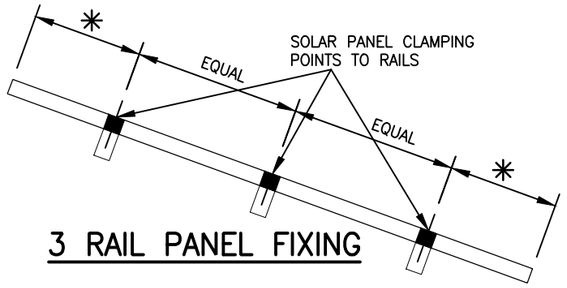


2 RAIL PANEL FIXING



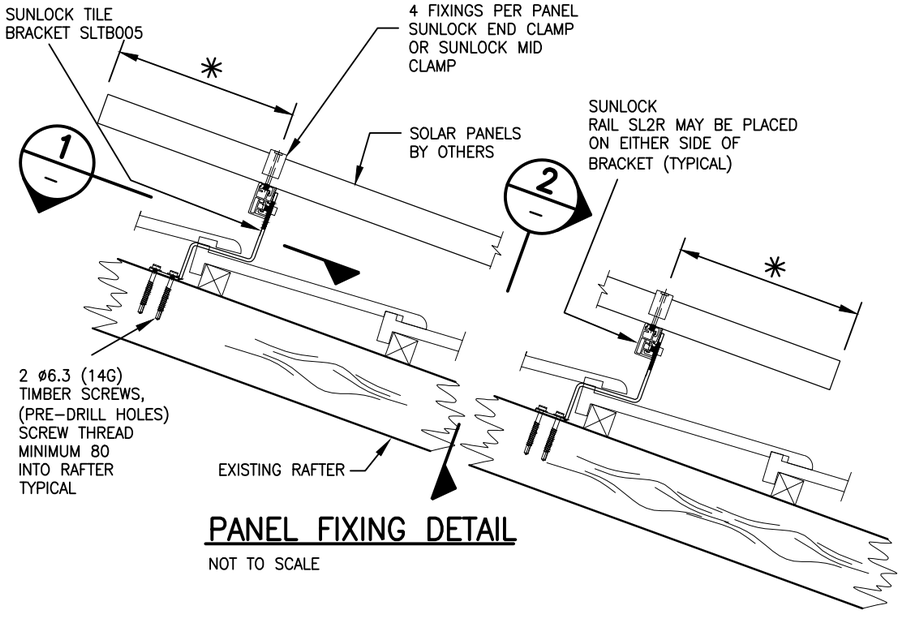
SECTION 1

NOT TO SCALE



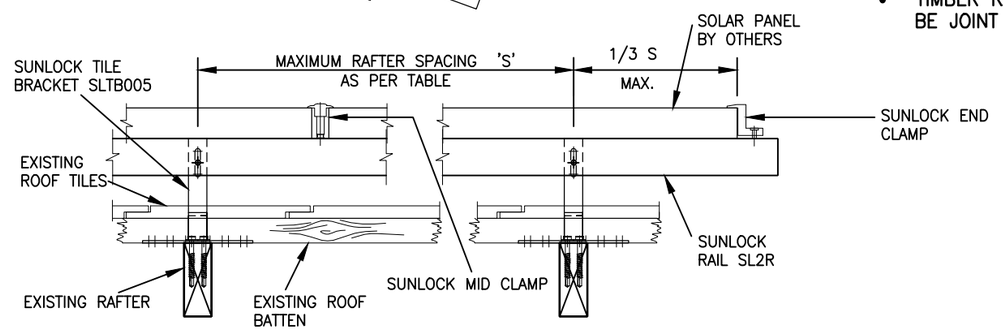
3 RAIL PANEL FIXING

✳ CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL



PANEL FIXING DETAIL

NOT TO SCALE



SECTION 2

NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK FOR 10° – 20° TILED ROOFS
- PORTRAIT MOUNTED PANELS
- SUNLOCK TILE BRACKET

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY = 3; Mz,CAT = 0.83
- REGION A; VR = 45 m/s
- REGION B; VR = 57 m/s

LIMITATIONS

- **THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.**
- **IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (IE. A SLOPE, A HILL ETC) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.**
- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 10° ROOF PITCH
- MAXIMUM 20° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER TILE BRACKET 1.03kN
- TIMBER RAFTERS TO SUPPORT FRAME TO BE JOINT GROUP J4 OR BETTER

APPROVED FOR CONSTRUCTION

THIS DRAWING HAS BEEN ASSIGNED AN ELECTRONIC SIGNATURE CODE. THE PRESENCE OF THIS CODE SIGNIFIES THAT THIS IS THE CERTIFIED DRAWING ISSUED FOR CONSTRUCTION.

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No.	Issue/Amendment	App'd	Date
A	ISSUED FOR CONSTRUCTION	R.O.	15.12.11
B	GENERAL AMENDMENTS	R.O.	29.06.12
C	BRACKET AMENDED	R.O.	31.08.12

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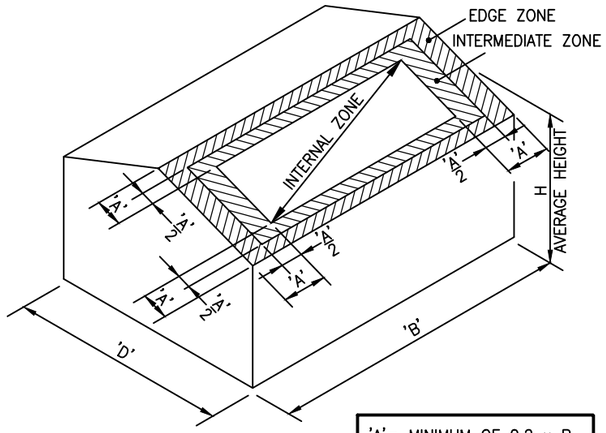
Client: ENERGY MATTERS PTY LTD

SUNLOCK
MOUNTING SYSTEM AND FIXINGS

TILED ROOF 10° – 20° PITCH, TC3
TIMBER ROOF STRUCTURE

Electronic Code	Signature Date
RO74427	31.08.12
Design: R.H	Drawn: IGS
Scale at A3: N/A	Date: AUG 2011
Job No.: 2011.0063	Drg. No.: S9 C

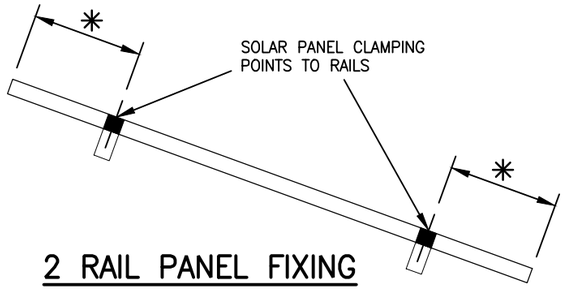


'A'= MINIMUM OF 0.2 x B,
0.2 x D OR 1 x H

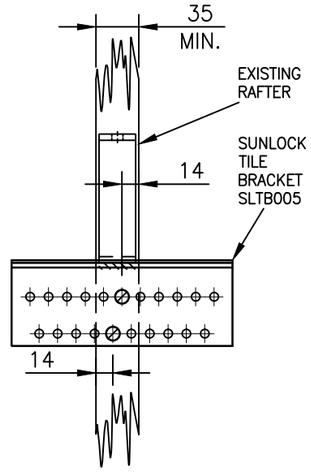
TILED ROOF – INSTALLATION ZONES

NOT TO SCALE

TERRAIN CATEGORY 3			
MAXIMUM RAFTER SPACING 'S' IN mm, FOR TILED ROOFS OF PITCH 20°–35°			
LOCATION	No OF RAILS	WIND REGION A	WIND REGION B
INTERNAL ZONE	2	1800	1140
	3	1800	1425
INTERMEDIATE ZONE	2	1220	760
	3	1525	950
EDGE ZONE	2	910	570
	3	1145	710

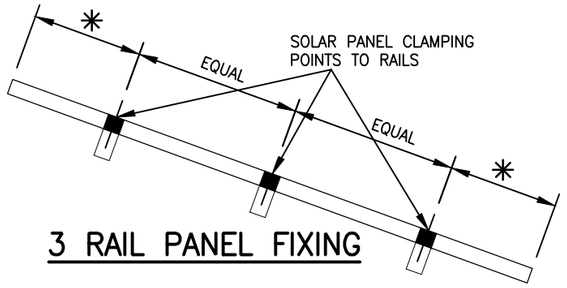


2 RAIL PANEL FIXING

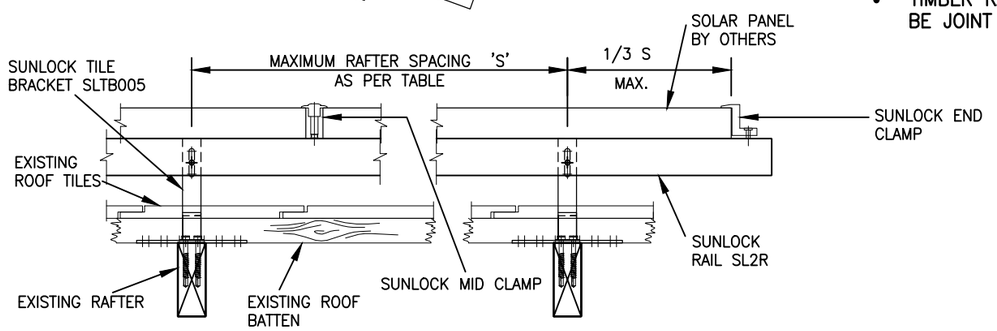


SECTION 1

NOT TO SCALE



3 RAIL PANEL FIXING



SECTION 2

NOT TO SCALE

✳ CANTILEVER 10% TO 25% OF PANEL SIZE IN ACCORDANCE WITH THE SOLAR PANEL MANUFACTURER'S DETAIL

PANEL FIXING DETAIL

NOT TO SCALE

PRODUCT NAME

SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION

- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK FOR 20° – 35° TILED ROOFS
- PORTRAIT MOUNTED PANELS
- SUNLOCK TILE BRACKET

MANUFACTURER'S NAME

ENERGY MATTERS PTY LTD

DESIGN CRITERIA

- WIND SPEEDS AND PRESSURES ARE CALCULATED IN ACCORDANCE WITH AS/NZS 1170.2: 2011
- IMPORTANCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0
- TERRAIN CATEGORY = 3; Mz,CAT = 0.83
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- MAXIMUM ROOF HEIGHT= 10m
- MINIMUM 20° ROOF PITCH
- MAXIMUM 35° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1680mm x 1000mm
- FOR RAIL AND RAIL FIXING ONLY.
- MAX ULTIMATE UP–LIFT FORCE PER TILE BRACKET 1.03kN
- TIMBER RAFTERS TO SUPPORT FRAME TO BE JOINT GROUP J4 OR BETTER

APPROVED FOR CONSTRUCTION

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Client: ENERGY MATTERS PTY LTD

SUNLOCK
MOUNTING SYSTEM AND FIXINGS

TILED ROOF 20° – 35° PITCH, TC3
TIMBER ROOF STRUCTURE

Electronic Code	Signature Date
RO74427	31.08.12
Design: R.H	Drawn: IGS
Scale at A3: N/A	Date: AUG 2011
Job No.: 2011.0063	Drg. No.: S10 C