

Our Ref: 25151

2 July 2013

Clenergy Australia
18/20 Duerdin Street
Clayton North VIC 3168

Array Frame Engineering Certificate

Installation of tilt solar system array on tin roof

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of New Zealand Building Regulations, have carried out a structural design check of the Tilt Leg System installation within New Zealand. The design check has been based on the information in the Intallation Guide PV-ezRack SolarRoof Adjustable Tilt Legs and schematic drawings of the system components by Xiamen Clenergy co.,Ltd, provide by Clenergy Australia.

We find the installation of the tilt array frame on tin roof to be structurally sufficient for New Zealand use based on the following conditions:

- Wind Loads to AS/NZ1170.2:2011 Admt 2-2012
- Wind Region A and W
- Wind Terrain Category 2 & 3
- Wind average recurrence interval of 100 years region A and W
- Maximum Building height 20 m
- Max. Solar Panel Dimensions 2000x1000

Refer to attached summary table for interface spacing.

Construction is to be carried out strictly in accordance with the manufacturers instructions. This work was designed in accordance with the provisions of New Zealand Building Regulations and in accordance with sound, widely accepted engineering principles.

Yours faithfully,
Gamcorp (Melbourne) Pty Ltd



Martin Gamble
Managing Director
MAICD



Milan Bjelobrk
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Structural Design Documentation

PV-ezRack® SolarRoof Adjustable tilt leg Frame spacing table According to AS/NZS 1170.2:2011 With in New Zealand

For:

Clenergy Australia



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ISO 9001:2008 Register
Certificate No:

Job No: 25151

Client: Clenergy Australia

Project: PV-ezRack® SolarRoof Adjustable tilt leg

Address: With in New Zealand

Australian Standards

AS 1170. 2011 – Structural Design Actions

Part 0 – General Principles

Part 1 – Permanent imposed and other actions

Part 2 – Wind Actions

AS 1664.1 – Aluminium structures - Limit state design

Wind Terrain Category:

WTC 2

Designed: B.C

Date: Feb-14

Client: **Clenergy Australia**
 Project: **PV-ezRack® SolarRoof Adjustable tilt leg**
 Address: **With in New Zealand**
 Designed: **B.C**

Job: **25151**
 Date: **Feb-14**

PV-ezRack® SolarRoof Frame spacing Table for Adjustable Tilt Leg

Type of Rail ER-R-ST
 Type of Interface ER-TL-10/15, ER-TL-15/30 and ER-TL-30-60
 Solar Panel Dimension 2mx1m
 Terrain category 2

Solar panel angle to the horizontal 10°-15°

Wind Region	Building Height - H (m)							
	H≤10		10<H≤15		15<H≤20			
	Edge	Middle	Edge	Middle	Edge	Middle	Edge	Middle
A	1148	1285	1118	1250	1101	1231		
W	1059	1181	1032	1150	1016	1133		

Solar panel angle to the horizontal 15°-25°

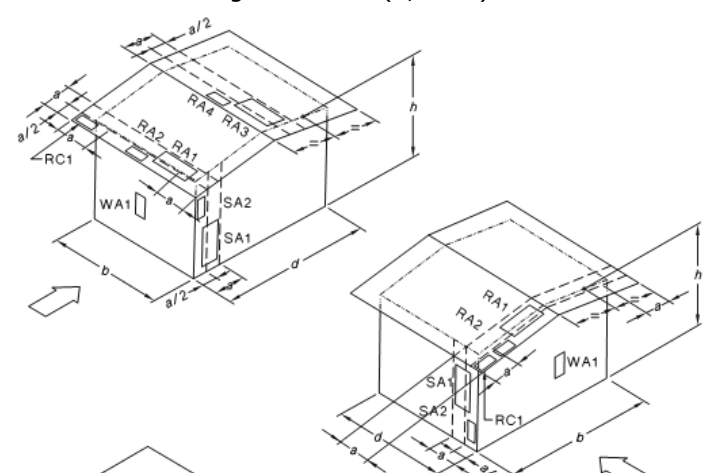
Wind Region	Building Height - H (m)							
	H≤10		10<H≤15		15<H≤20			
	Edge	Middle	Edge	Middle	Edge	Middle	Edge	Middle
A	1024	1141	998	1111	983	1095		
W	946	1053	922	1026	909	1011		

Solar panel angle to the horizontal 25°-60°

Wind Region	Building Height - H (m)							
	H≤10		10<H≤15		15<H≤20			
	Edge	Middle	Edge	Middle	Edge	Middle	Edge	Middle
A	1048	1167	1022	1137	943	1049		
W	969	1077	945	1050	872	969		

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Note 1	General Notes		
	Recommended screws		
	Metal Purlins/Battens	Fasteners to use	
	0.55 mm – 0.75 mm	14g -10 TPI (T17) OR M6 Roof Zips	
	1.5 – 1.9 mm	14g - 10 TPI Tekes OR M6 Roof Zips	
	2.4 mm and Above	14g - 10 TPI Tekes	
	Wood purlins and Rafter	Fasteners to use	
	Pine and Hardwood (35mm embedment and above)	M6 (12g) with 10 TPI	
Note 2	All screw holes must be pre-drilled, before screws are installed If screw needs to be replaced next size up must be used.		
Note 3	Above Spacing calculated based on 1.5 mm steel purlin OR F17 Hardwood. If the supporting members are found to be otherwise, then spacing should be reduced as follows:		
	Material	10°-15°	15°-25°
	0.55 mm steel batten	38.00%	38.00%
	0.75 mm steel batten	0.00%	0.00%
	1.2 mm purlin	8.00%	0.00%
Note 4	Following components are satisfied to use according to AS/NZS 1170.2:2011		
	Components	Part Number	Description
	MT-base Rail	ER-R-MT2560	MT-Rail 2560 mm
	Corrugated Adapter	ER-AD-C110	Adapter for corrugated iron roof
	Tilt Legs	ER-TL-30	Tilt Legs Kit fixed 30° (front and back leg)
	Hanger Bolt	ER-HB-200/WOMP	Hanger Bolt without mounting plate M10x200. Fixed to timber purlin only. Minimum embedment length 70 mm.
	Roof extender	ER-RE-200	Roof Hook Extender 200mm
Note 5	Figure shows the building dimension (b,d & h)		
			

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Certificate No: AU1222

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Address: With in New Zealand

Australian Standards

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AS 1664.1 – Aluminium structures - Limit state design

Wind Terrain Category:

WTC 2

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Date: Feb-14

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PV-ezRack® SolarRoof Frame spacing Table for Adjustable Tilt Leg

Type of Rail ER-R-ST
 Type of Interface ER-TL-10/15, ER-TL-15/30 and ER-TL-30-60
 Solar Panel Dimension 2mx1m
 Terrain category 3

Solar panel angle to the horizontal 10°-15°

Wind Region	Building Height - H (m)							
	H≤10		10<H≤15		15<H≤20			
	Edge	Middle	Edge	Middle	Edge	Middle	Edge	Middle
A	1273	1434	1224	1375	1188	1332		
W	1171	1312	1127	1261	1094	1223		

Solar panel angle to the horizontal 15°-25°

Wind Region	Building Height - H (m)							
	H≤10		10<H≤15		15<H≤20			
	Edge	Middle	Edge	Middle	Edge	Middle	Edge	Middle
A	1131	1265	1089	1217	1058	1180		
W	1043	1164	1006	1120	977	1088		

Solar panel angle to the horizontal 25°-60°

Wind Region	Building Height - H (m)							
	H≤10		10<H≤15		15<H≤20			
	Edge	Middle	Edge	Middle	Edge	Middle	Edge	Middle
A	1157	1292	1114	1243	1014	1130		
W	747	1190	986	1146	937	1042		

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	2.4 mm and Above	14g - 10 TPI Tekes	
	Wood purlins and Rafter	Fasteners to use	
	Pine and Hardwood (35mm embedment and above)	M6 (12g) with 10 TPI	
Note 2	All screw holes must be pre-drilled, before screws are installed If screw needs to be replaced next size up must be used.		
Note 3	Above Spacing calculated based on 1.5 mm steel purlin OR F17 Hardwood. If the supporting members are found to be otherwise, then spacing should be reduced as follows:		
	Material	10°-15°	15°-25°
	0.55 mm steel batten	45.00%	19.00%
	0.75 mm steel batten	13.00%	13.00%
	1.2 mm purlin	11.00%	0.00%
		25°-60°	26.00%
			13.00%
			0.00%
Note 4	Following components are satisfied to use according to AS/NZS 1170.2:2011		
	Components	Part Number	Description
	MT-base Rail	ER-R-MT2560	MT-Rail 2560 mm
	Corrugated Adapter	ER-AD-C110	Adapter for corrugated iron roof
	Tilt Legs	ER-TL-30	Tilt Legs Kit fixed 30° (front and back leg)
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Note 5	Figure shows the building dimension (b,d & h)		
	