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Our Ref: 2830/K.Z

29 November 2016

Xiamen Hopergy Photovoltaic Technology Co. Ltd.
No.630, Tonghong Road
Tongan District, Xiamen 361100
China

PV Array Frame Engineering Certification

Installation of Hopergy Roof Flush Mount Solar System on KlipLok 700 with HOP-SLR02 Rails

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian and New Zealand Building Regulations, have carried out a structural design check of Hopergy Roof Flush Mount Solar System installation on KlipLok 700 within Australia and New Zealand. The design check is based on the information and test report provided by Hopergy Australia (IMSOLAR).

We find the Installation of Hopergy Roof Flush Mount Solar System on KlipLok 700 for Australian and New Zealand use to be structurally sufficient based on the following conditions:

- Wind loads to AS/NZ1170.2:2011 Admt 3:2013
- Wind region A, B, C, D, W
- Wind terrain category 2 & 3
- Wind average recurrence interval of 500 years
- Maximum building height 20m
- The maximum PV panel dimensions to be 1670mm x 1000mm
- Maximum weight of the PV panel and array frame to be 15 kg/m²
- Rails to be HOP-SLR02
- The roof interface to be HOP-KLK700 as per test report 2016111201
- Each PV panel to be installed using 2 rails minimum in all circumstances
- Installation of PV array to be done in accordance with the PV installation manual
- The certification **excludes** assessment of roof structure and PV panels

Refer to attached summary table for interface spacing

NOTES:

- **The recommended spacing nominated in this certification is based on the capacity of the array frame, not the roof structure and PV panel. It is the responsibility of the installer to adopt the most critical spacing.**



Relationships built on trust



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- **If any of the above conditions cannot be met, the structural engineer must be notified immediately.**

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

Yours faithfully,
Gamcorp (Melbourne) Pty Ltd

A handwritten signature in blue ink, appearing to read 'Martin Gamble'.

Martin Gamble
Managing Director
MAICD

A handwritten signature in blue ink, appearing to read 'Mudi Ariyaratna'.

Mudi Ariyaratna
B.Eng(Civil)(Hons)Monash, M.Eng&Mgt, MIEAust,
CPEng, NPER, RBP EC-39699, RPEQ- 15899

Structural Design Documentation

KlipLok 700 Flush Mount PV Racking System Interface Spacing Table According to AS/NZS 1170.2-2011 Amdt 3-2013 with HOP-SLR02 Rails within Australia and New Zealand Terrain Category 2 & 3

For: Xiamen Hopergy Photovoltaic
Technology Co. Ltd.



Job Number: 2830
Date: 29 November 2016

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ISO 9001:2008 Registered Firm
Certificate No: AU1222

Job No: 2830

Client: Xiamen Hopergy Photovoltaic Technology Co. Ltd.

Project: Flush Mount Interface Spacing Table for KlipLok 700

Address: within Australia and New Zealand

Australian and New Zealand Standards

AS/NZS 1170. 2011 – Structural Design Actions

Part 0 – General Principles

Part 1 – Permanent imposed and other actions

Part 2 – Wind Actions

AS/NZS 1252 – High Strength Structural Bolting

AS 4055 – Wind Loads for Housing

AS/NZS 1664 – Aluminium Structures

AS 4100 – Steel Structures

AS/NZS 4600 – Cold-Formed Steel Structures

Wind Terrain Category:

WTC 2 & 3

Designed: K.Z

Date: Nov-16

Client: **Xiamen Hopergy Photovoltaic Technology Co. Ltd.**
 Project: **Flush Mount Interface Spacing Table for KlipLok 700**
 Address: **within Australia and New Zealand**
 Designed: **K.Z**

Job: **2830**
 Date: **Nov-16**

Checked: **M.A**

Flush Mount Interface Spacing Table for KlipLok 700

Type of Rail: HOP-SLR02
 Type of Interface: HOP-KLK700
 Solar Panel Dimension: 1.67m x 1.0m
Terrain category: 2

Roof Angle (Φ) – $0^\circ \leq \Phi < 5^\circ$

Wind Region	Roof Angle (°)	Building Height – H (m)							
		H≤10			10<H≤15			15<H≤20	
		D.W & U.W	Central		D.W & U.W	Central		D.W & U.W	Central
A		1463	1606		1319	1564		1243	1527
B		892	1091		806	986		760	930
C		594	725		537	655		507	619
D		369	449		334	407		316	384
W		1124	1378		1015	1244		957	1172

Roof Angle (Φ) – $5^\circ \leq \Phi \leq 30^\circ$

Wind Region	Building Height – H (m)								
		H≤10			10<H≤15			15<H≤20	
		D.W & U.W	Central		D.W & U.W	Central		D.W & U.W	Central
A		1463	1677		1319	1632		1243	1607
B		892	1283		806	1158		760	1091
C		594	850		537	768		507	725
D		369	526		334	476		316	449
W		1124	1543		1015	1463		957	1379

D.W & U.W – Downwind and Upwind refer to note 3.



Relationships built on trust

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Roof Angle (Φ) – $30^\circ < \Phi \leq 60^\circ$

Wind Region	Building Height – H (m)								
		H≤10			10<H≤15			15<H≤20	
		Intermediate	Internal		Intermediate	Internal		Intermediate	Internal
A		1709	1858		1673	1822		1653	1801
B		1433	1819		1293	1783		1219	1762
C		948	1450		856	1308		808	1232
D		586	889		530	804		500	758
W		1588	1747		1546	1711		1522	1691

D.W & U.W – Downwind and Upwind refer to note 3.

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Flush Mount Interface Spacing Table for KlipLok 700

Type of Rail: HOP-SLR02
 Type of Interface: HOP-KLK700
 Solar Panel Dimension: 1.67m x 1.0m
Terrain category: 3

Roof Angle (Φ) – $0^\circ \leq \Phi < 5^\circ$

Wind Region	Building Height – H (m)							
	H≤10		10<H≤15		15<H≤20			
	D.W & U.W	Central	D.W & U.W	Central	D.W & U.W	Central		
A	1689	1787	1624	1716	1575	1663		
B	1316	1617	1136	1394	1014	1242		
C	871	1066	754	922	674	823		
D	539	658	467	570	418	510		
W	1553	1639	1436	1577	1280	1530		

Roof Angle (Φ) – $5^\circ \leq \Phi \leq 30^\circ$

Wind Region	Building Height – H (m)							
	H≤10		10<H≤15		15<H≤20			
	D.W & U.W	Central		D.W & U.W	Central		D.W & U.W	Central
A	1689	1870		1624	1794		1575	1738
B	1316	1812		1136	1642		1014	1462
C	871	1253		754	1083		674	966
D	539	771		467	668		418	597
W	1553	1712		1436	1646		1280	1596

D.W & U.W – Downwind and Upwind refer to note 3.

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Roof Angle (Φ) – $30^\circ < \Phi \leq 60^\circ$

Wind Region	Building Height – H (m)							
	H≤10		10<H≤15		15<H≤20			
	Intermediate	Internal	Intermediate	Internal	Intermediate	Internal	Intermediate	Internal
A	1846	1995	1794	1944	1754	1904		
B	1807	1957	1756	1905	1635	1865		
C	1400	1825	1209	1773	1078	1654		
D	859	1312	744	1133	665	1011		
W	1735	1885	1684	1833	1644	1793		

D.W & U.W – Downwind and Upwind refer to note 3.

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General Notes

Note 1	Following components are satisfied to use according to AS/NZS 1170.2-2011 Amdt 3-2013		
	Components	Part Number	Description
	HOP-SLR02 Rail	1.01.SSR02.00000-00	
	HOP-KLK700 Clamp		as per test 2016111201
Note 2	Terrain category 2 (TC2) refers to open terrain, including grassland, with well-scattered obstructions having heights generally from 1.5 m to 5 m, with no more than two obstruction per obstructions per hectare.		
	Terrain category 3(TC3) refers to numerous closely spaced obstructions having heights generally from 3 m to 10 m. For example suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011 Amdt 3-2013 for definition of Terrain category 3.		
Note 3	For the definition of Downwind, Upwind end and central, refer figure D9 from AS/NZS 1170.2-2011 Amdt 3-2013.		