Hopergy Quick User Guide

Contents

Australian Wind Regions for Maximum Rail Support Spacing

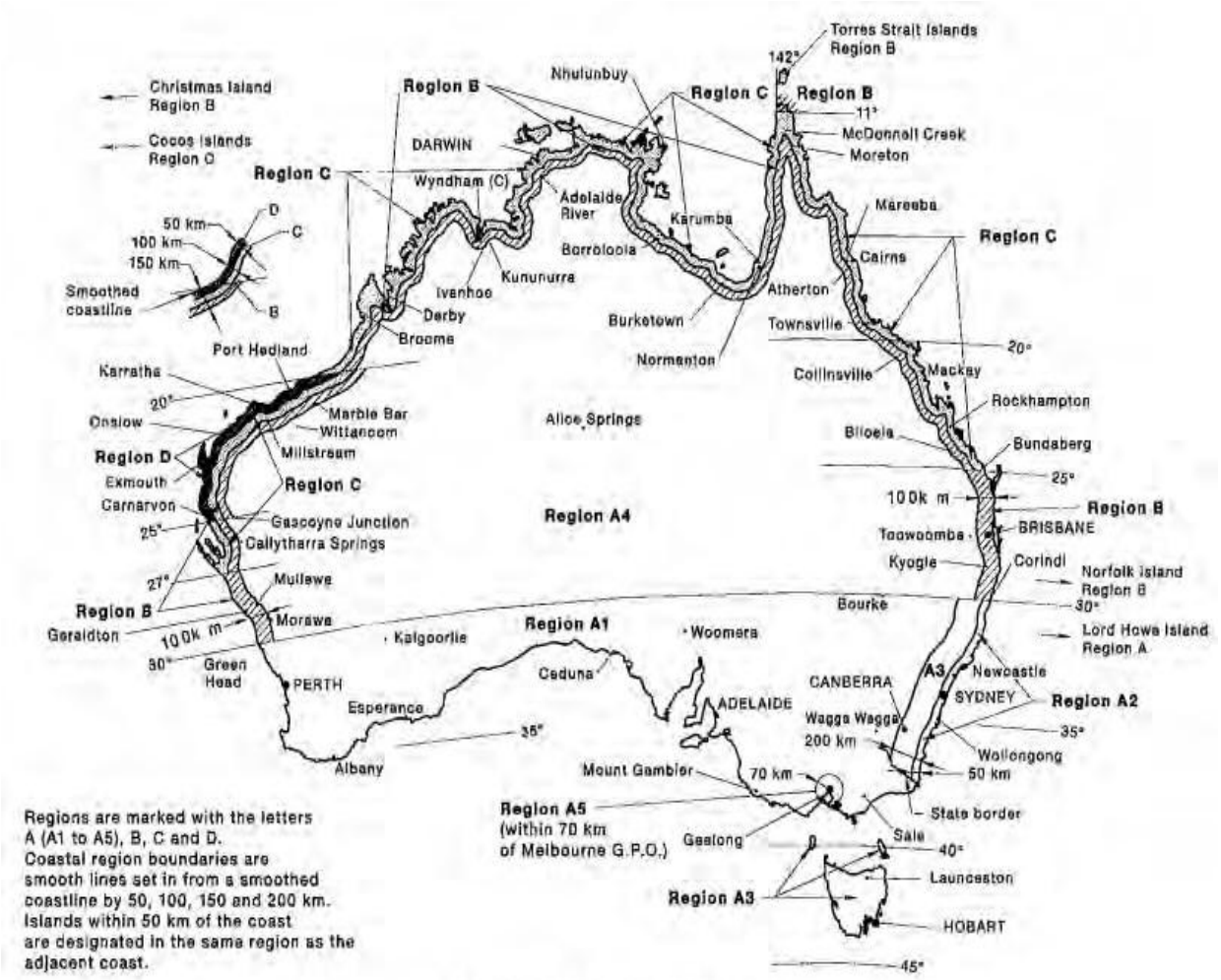
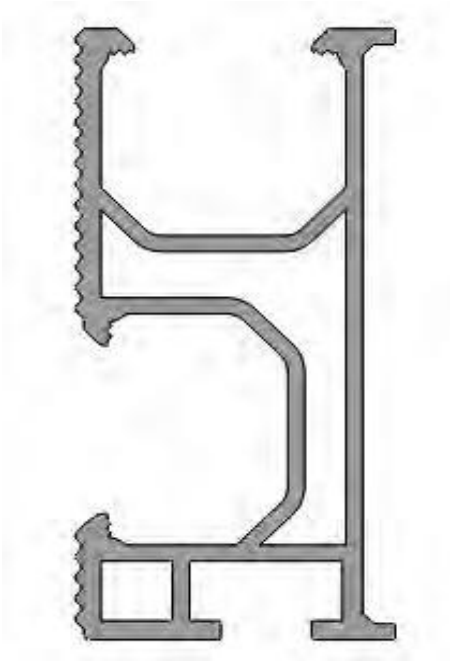


FIGURE 3.1(A) WIND REGIONS

Hopergy Select Series Rail System

Hopergy Select Series Rail is an optimized solution, it has THREE openings which make them compatible with a large variety of roof interface brackets. It is a smart system of engineered components that allows installers to quickly assemble .Its corrugated surfaces on both the rails and roof hooks ensure the secure connection of these parts. The loop design maximizes and distributes rail strength evenly throughout the length of the rails.



Select Series Rail

Select Rail Tile Spacing Table

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2400	1740	1710	1200	1070	755	660	465
10 Meters	2050	1445	970	1000	965	680	595	420

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1980	1390	1360	965	855	680	520	370
10 Meters	1630	1150	1130	800	775	545	475	335

Min.50mm embedment to existing timber rafters.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

Select Rail Tin Spacing Table

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1600	1220	1150	845	720	530	450	325
10 Meters	1350	1010	950	700	650	475	400	290

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1350	975	940	675	600	420	350	260
10 Meters	1100	810	780	560	530	380	330	235

Min. M12Φ screws Australian standard or equivalent.

Min. 35mm embedment to existing timber batten.

Min. steel batten/ purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

Select Rail Tilt Spacing Table

1) For 10°-15°:

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2200	1100	1500	750	720	360	440	
10 Meters	1800	900	1250	625	650	325	400	
15 Meters	1650	825	1150	575	570		350	
20 Meters	1550	775	1050	525	510		315	
For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1800	900	1250	625	588		362	
10 Meters	1500	750	1000	500	530		327	
15 Meters	1350	675	940	470	465			
20 Meters	1250	625	890	445	415			

Min. 2-M12Φ screws Australian standard or equivalent.

Min. 35mm embedment to existing timber batten.

Min. steel batten/ purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

2) For 15°-60°:

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2100	1050	1450	725	900	450	560	
10 Meters	1740	870	1200	600	820	410	500	
15 Meters	1580	790	1090	545	720	360	440	
20 Meters	1495	745	1030	515	640	320	395	

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1680	840	1160	580	720	360	440	
10 Meters	1390	695	960	480	650	325	400	
15 Meters	1260	630	870	435	570		350	
20 Meters	1190	595	820	410	510		315	

Min. 2-M12Φ screws Australian standard or equivalent.

Min. 35mm embedment to existing timber batten.

Min. steel batten/ purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

Select Rail Tripod Spacing Table

1) For 10°-15°:

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2200	1100	1500	750	720	360	440	
10 Meters	1800	900	1250	625	650	325	400	
15 Meters	1650	825	1150	575	570		350	
20 Meters	1550	775	1050	525	510		315	
For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1800	900	1250	625	588		362	
10 Meters	1500	750	1000	500	530		327	
15 Meters	1350	675	940	470	465			
20 Meters	1250	625	890	445	415			

Min. 4-M12Φ screws Australian standard or equivalent.

Min. 35mm embedment to existing timber batten.

Min. steel batten/ purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

2) For 15°-60°:

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2100	1050	1450	725	900	450	560	
10 Meters	1740	870	1200	600	820	410	500	
15 Meters	1580	790	1090	545	720	360	440	
20 Meters	1495	745	1030	515	640	320	395	

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1680	840	1160	580	720	360	440	
10 Meters	1390	695	960	480	650	325	400	
15 Meters	1260	630	870	435	570		350	
20 Meters	1190	595	820	410	510		315	

Min. 4-M12Φ screws Australian standard or equivalent.

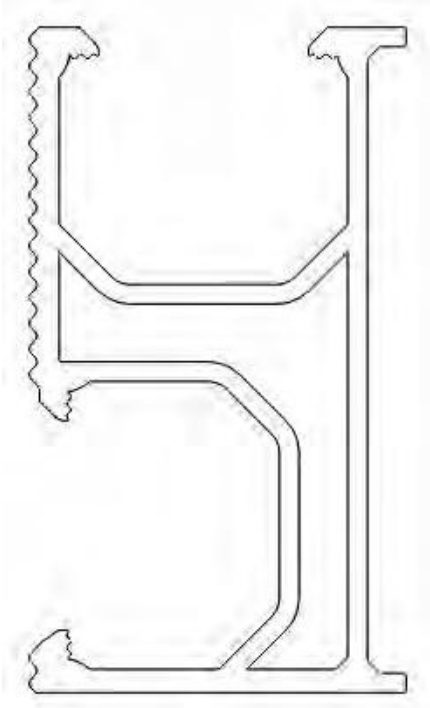
Min. 35mm embedment to existing timber batten.

Min. steel batten/ purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

Hopergy Select-lite Series Rail System

Hopergy Select-lite Series Rail is an economical solution with focusing on both installation cost and production efficiency. It has TWO openings which make them compatible with a large variety of roof interface brackets. It's a smart system of engineered components that allows installers to quickly assemble .Its corrugated surfaces on both the rails and roof hooks ensure the secure connection of these parts. The Loop design maximizes and distributes rail strength evenly throughout the length of the rails.



Select-lite Series Rail

Select-lite Rail Tile Spacing Table

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2100	1740	1710	1200	1070	755	660	465
10 Meters	2000	1445	970	1000	965	680	595	420

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1980	1390	1360	965	855	680	520	370
10 Meters	1630	1150	1130	800	775	545	475	335

Min. 50mm embedment to existing timber rafters.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

Select-lite Rail Tin Spacing Table

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1600	1220	1150	845	720	530	450	325
10 Meters	1350	1010	950	700	650	475	400	290

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1350	975	940	675	600	420	350	260
10 Meters	1100	810	780	560	530	380	330	235

Min. M12Φ screws Australian standard or equivalent.

Min. 35mm embedment to existing timber batten.

Min. steel batten/purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

Select-lite Rail Tilt Spacing Table

1) For 10°-15°:

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2000	1000	1400	700	675	338	417	
10 Meters	1700	850	1200	600	610	305	376	
15 Meters	1500	750	1050	525	532		328	
20 Meters	1450	725	1000	500	479		300	

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1700	850	1150	575	552		340	
10 Meters	1400	700	950	475	500		306	
15 Meters	1250	625	880	440	435			
20 Meters	1200	600	840	420	390			

Min. 2-M12Φ screws Australian standard or equivalent.

Min. 35mm embedment to existing timber batten.

Min. steel batten/ purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

2) For 15°-60°:

For Up To 1600mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	2100	1050	1450	725	900	450	560	
10 Meters	1740	870	1200	600	820	410	500	
15 Meters	1580	790	1090	545	720	360	440	
20 Meters	1495	745	1030	515	640	320	395	

For Up To 1960mm Long Panel (2 Rails)								
Max. Support Spacing (mm)								
Installation	Region A		Region B		Region C		Region D	
Height(m)	Center	Edge	Center	Edge	Center	Edge	Center	Edge
5 Meters	1680	840	1160	580	720	360	440	
10 Meters	1390	695	960	480	650	325	400	
15 Meters	1260	630	870	435	570		350	
20 Meters	1190	595	820	410	510		315	

Min. 2-M12Φ screws Australian standard or equivalent.

Min. 35mm embedment to existing timber batten.

Min. steel batten/purlin thickness=0.6mm.

For 1960mm Long Panels with 3 supporting rails, the maximum Spacing can be increased by 25%.

Hopergy KlipLok interface Clamp Spacing Table

Hopergy KlipLok Interface is a fantastic versatile exterior cladding clamp, the double-sided supporting walls ensure it has much better structural stability than other similar brackets on market.

Attention installer:

For critical installations on metal roof by using KlipLok interface inspections by the required by a local qualified engineer prior to any installation, to ensure the existing metal roof is under suitable conditions, although we have provided the Max. Support Spacing as a guide only. Hopergy expresses no opinions as to the suitability of KlipLok interface for any specific application or project condition. Please ensure you use Hopergy KlipLok Interface responsibly.

Assumption:
The existing roofing is firmly/properly fixed to the existing roof battens.

Please use the following table to determine the KlipLok interface spacing for metal sheet roof installations for Australia A,B,C and D wind zones:

Ⅰ. Max. Support Spacing (mm) for solar panels being fixed directly with mid clamps and end clamps.

	Region A		Region B		Region C		Region D	
Roof Type	Center	Edge	Center	Edge	Center	Edge	Center	Edge
KlipLok 406	1400	710	920	460	640			
KlipLok 700 and Speed Deck Ultra	2000	1000	1320	660	950	470	580	
KingKlip 700	1200	600	810	410	600			

Ⅱ. Max. Support Spacing (mm) for composite application with tilt legs up to 15 degrees

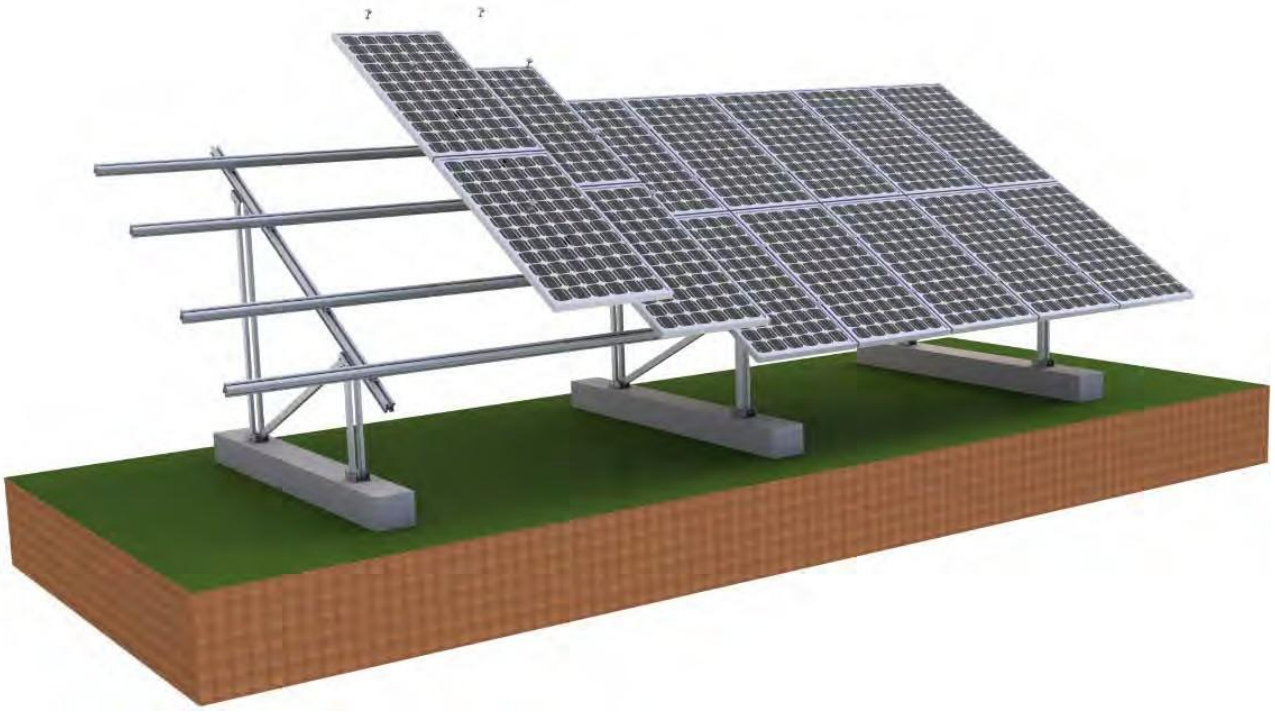
Roof Type	Region A	Region B	Region C
KlipLok 406	820	520	
KlipLok 700 and Speed Deck Ultra	1200	760	520
KingKlip 700	550		

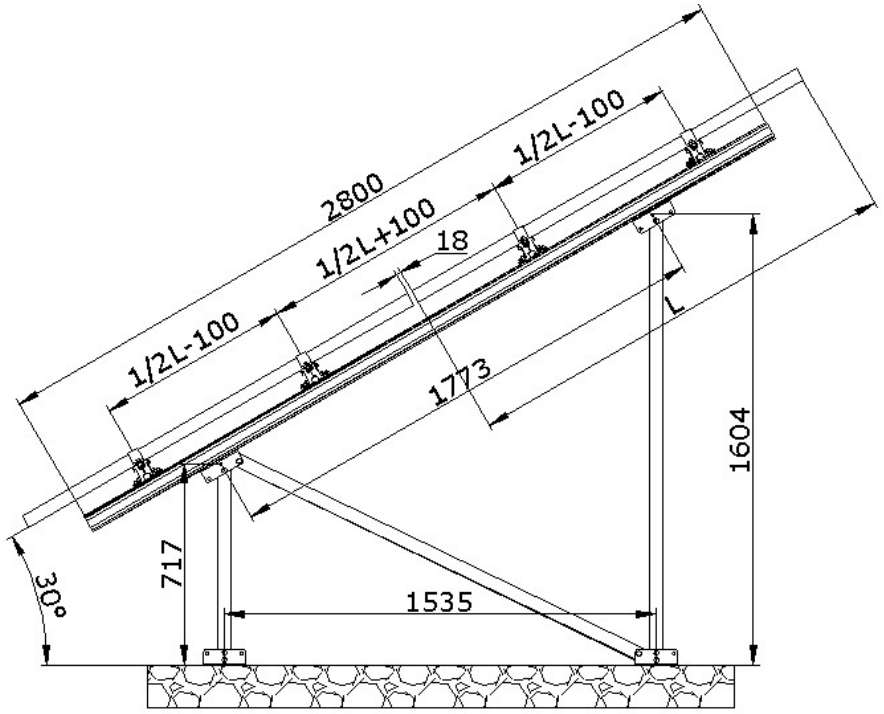
Ⅲ. Max. Support Spacing (mm) for composite application with tilt legs up to 30 degrees

Roof Type	Region A	Region B	Region C
KlipLok 406	560		
KlipLok 700 and Speed Deck Ultra	820	530	
KingKlip 700	480		

Hopergy Ground Mount Installation Guide

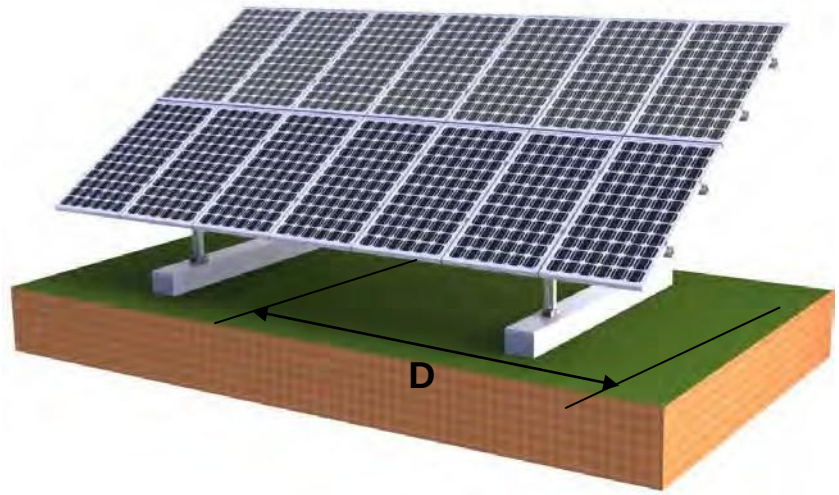
Hopergy's Ground Mount I is a pre-assembled ground mount system suitable for large scale commercial and utility scale installations. Ground Mount I has been developed to fit all PV modules. Using high quality engineered Hopergy DURA series rail and flexible support kit, Ground Mount I saves developers and installers time and money when delivering large scale projects.





L=Solar Panel length. Hopergy Ground Mount I is compatible for panels up to 1800mm x1000mm).

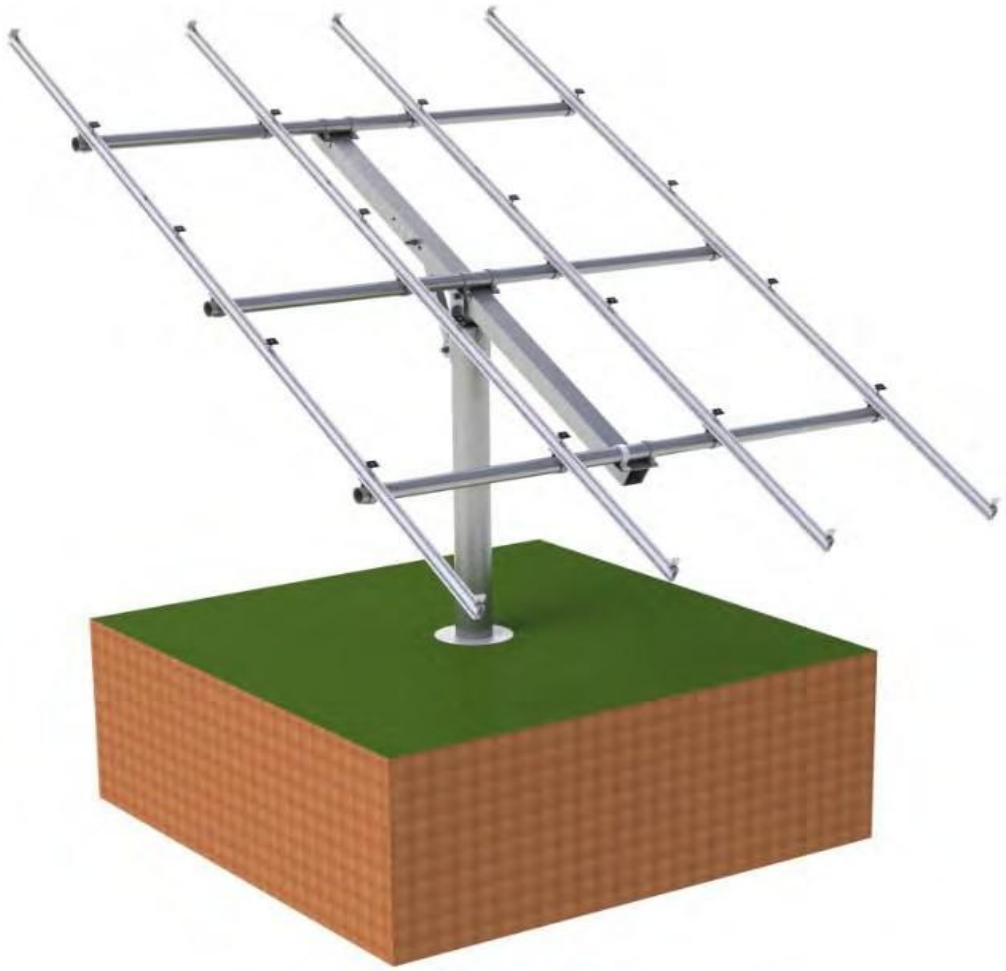
Maximum Spacing between Legs:

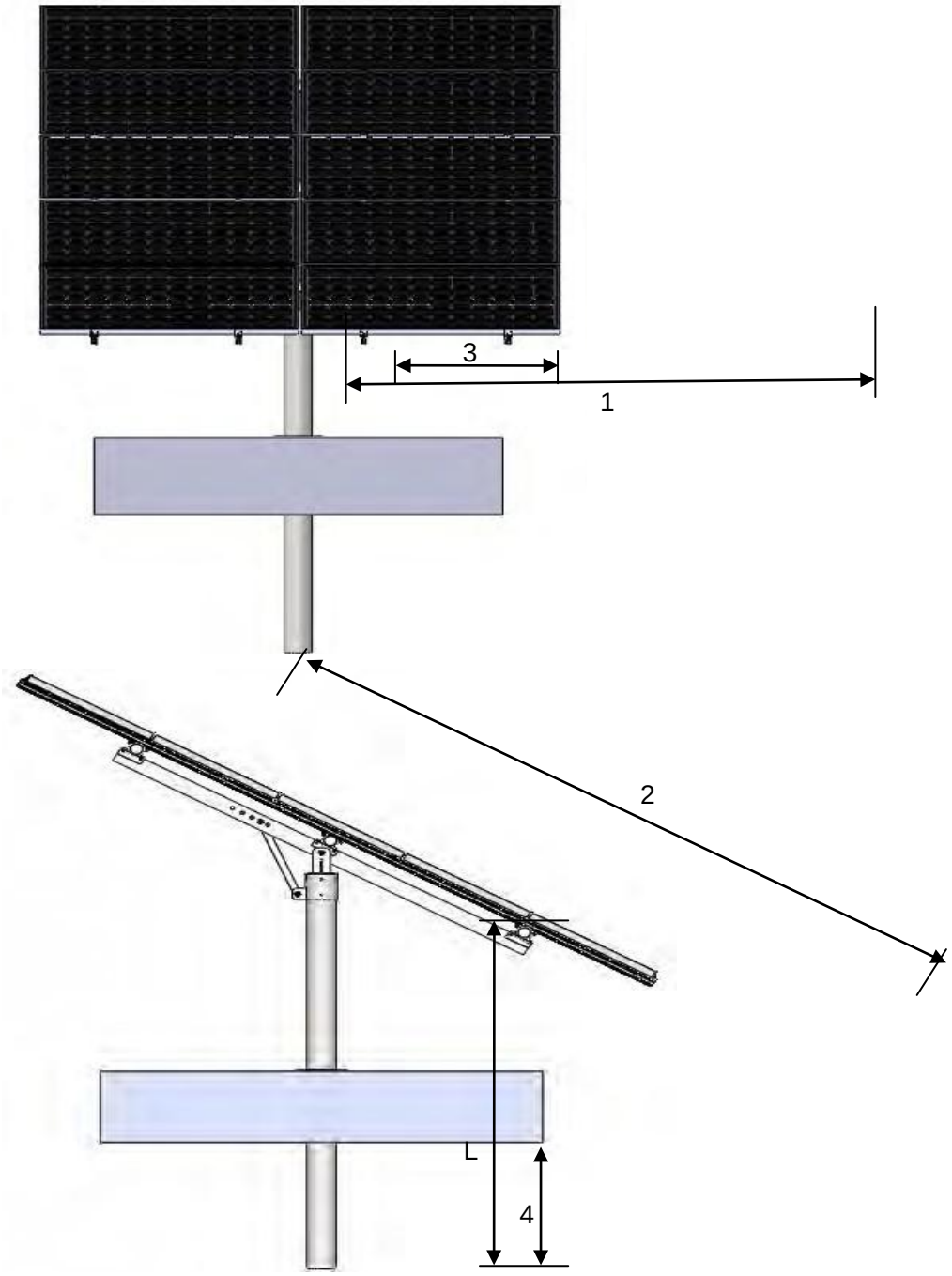


Wind Zone	A	B	C	D
Wind Speed(m/s)	43.4	53.0	65.2	81.7
D maximum spacing(mm)	2850	1880	1255	795

Hopergy Pole Mount Installation Guide

Hopergy Pole Mount is one optimized solution to mount 2, 3, 4, 6, 8 or 10 panels each pole with effective, flexible and durable single support post. Each pole system can be adjusted to five angles for being fixed at 10, 20, 30, 40 and 50 degree.





Planning the array layout

1. Array width = number of modules in the horizontal direction x module length + 11/16 in (18 mm).

2. Array height = number of modules in the vertical direction x (module width + 11/16 in (18 mm)) +1-1/4 in (32 mm)

3. Horizontal spacing of the rails attachment = approx. ½ of module length

4. Concrete footing under pole:

a. 4 Panel-------Min 1200mmD*600mm SQ

b. 6 Panel-------Min 1200mmD*600mm SQ

c. 8 Panel-------Min 1300mmD*650mm SQ

d. 10 Panel------Min 1300mmD*750mm SQ

Select Series Rail System AS/NZS 1170.2 Certificate

DOME
CONSULTING (Aust)

Dome Consulting (Aust) Pty Ltd
Suite 12.10 401 Docklands Drive
Docklands Vic 3008

Phone +61 3 9420 9777
mail@dome.com.au
www.dome.com.au
ABN: 32 146 605 870

Our Ref: LTR/10819/2/AV

CERTIFICATE

24/12/2012

This is to certify that at the request of Xiamen Hopergy Photovoltaic Technology Co., Ltd, Dome Consulting (Aust) Pty Ltd have reviewed the componentry used for the installation of Sunrack Solar Panels to existing roof structures.

The elements which were to be checked include:

- Ø Roof hooks
- Ø Supporting panel rail – Type A
- Ø Klamp lock chips
- Ø L Feet
- Ø Splice kit
- Ø Mounting base
- Ø Leg Pipe
- Ø Triangle Brackets

The check included a review of Australia wide wind loading conditions including Cyclonic conditions, in accordance to AS1170.2/Amdt2/2012.12.24

The general arrangement of the rails and supports for regions throughout Australia is to be provided by Xiamen Xiamen Hopergy Photovoltaic Technology Co., Ltd and to comply with Dome Consulting (Aust) Pty Ltd Structural Report 10819-000 Dated 23/08/2012.

The review has determined that all the above mentioned supporting componentry was found to be acceptable.

Attention Installer:

For Solar panels installed on metal roof by using klamp locks inspections by be required by a local qualified Engineer prior to any installation, to ensure the existing metal roof is under suitable conditions.

Assumption:

The existing roofing is firmly/properly fixed to the existing roof battens.

Should you have any further queries please do not hesitate to contact me.

Yours faithfully,

FOR & ON BEHALF OF DOME CONSULTING PTY LTD

Robert Cilia
BE (Civil) RBP RPEQ TBP

Select-lite Series Rail System AS/NZS 1170.2 Certificate

DOME
CONSULTING (Aust)

Dome Consulting (Aust) Pty Ltd
Suite 12.10 401 Docklands Drive
Docklands Vic 3008

Phone +61 3 9420 9777
mail@dome.com.au
www.dome.com.au
ABN: 32 146 605 870

Our Ref: LTR/10819/3/AV

24/12/2012

CERTIFICATE

This is to certify that at the request of Xiamen Hopergy Photovoltaic Technology Co., Ltd, Dome Consulting (Aust) Pty Ltd have reviewed the componentry used for the installation of Sunrack Solar Panels to existing roof structures.

The elements which were to be checked include:

- *Roof hooks*
- *Supporting panel rail – Type B*
- *Klamp lock chips*
- *L Feet*
- *Splice kit*
- *Mounting base*
- *Leg Pipe*
- *Triangle Brackets*

The check included a review of Australia wide wind loading conditions including Cyclonic conditions, in accordance to AS1170.2/Amdt2/2012.12.24.

The general arrangement of the rails and supports for regions throughout Australia is to be provided by Xiamen Xiamen Hopergy Photovoltaic Technology Co., Ltd and to comply with Dome Consulting (Aust) Pty Ltd Structural Report 10819B-000 Dated 25/08/2012.

For Solar panels installed on metal roof by using klamp locks inspections by be required by a local qualified Engineer prior to any installation, to ensure the existing metal roof is under suitable conditions.

Assumption:

The existing roofing is firmly/properly fixed to the existing roof battens.

Should you have any further queries please do not hesitate to contact me.

Yours faithfully,
FOR & ON BEHALF OF DOME CONSULTING PTY LTD

Robert Cilia
BE (Civil) RBP RPEQ TBP

Ground Mount PVGrid-I Certificate AS/NZS 1170.2 Certificate

SPAD
CONSULTING STRUCTURAL AND CIVIL ENGINEERS

11 November 2011

Project number: M137

Xiamen Hopergy Photovoltaic Technology Co. Ltd. (Client)
No. 46 1A Huli Av. Huli District
Xiamen China

Attention Mr.Hu.

Dear Madam,

RE: XIAMEN HOPERGY PHOTOVOLTAIC TECHNOLOGY AS1170.2 VERIFICATION OF GROUND MOUNTED FRAME SUPPORT

As requested, we have reviewed the structural adequacy of the Aluminum support framing and the fixings specified in 'Ground Mounting System I Installation Manual' prepared by Xiamen Hopergy Photovoltaic Technology.

Maximum spacing between two legs of support shall be as follows.

Wind Zone	A	B	C	D
Wind Speed Vr (m/s)	43.4	53.0	65.2	81.7
Maximum spacing D between frames (mm)	2850	1880	1255	795

Our design investigation is based on the following Australian Standards and sections of Building Code of Australia relevant to structural issues.

- AS1170.0-2002 Structural design Actions Part 0: General principles.
- AS1170.2-2002 Structural design Actions Part 2: Wind actions.
- AS 1664.1-1997 Aluminum structures Part 1: Limit state design.
- AS 3566.1-2002 Self-drilling screws for the building and construction industries.
- AS 3566.1-2002 Self-drilling screws for the building and construction industries.
- AS3566.2 – 2002 Part 2: Corrosion resistance requirements.
- ISO3506:1-2009 Mechanical Properties of Corrosion-Resistance Stainless Steel Fasteners.

Following design criteria has been used for the structural verification.

➢ Design Life	25 years.
➢ Importance Level	Type 2: Ordinary.
➢ Annual Probability of exceedance	1/250.
➢ Terrain Category to AS1170.2	2.
➢ Service Deflection	Not limited.
➢ Snow loading	Not considered.

SPAD Pty Ltd ABN 47 090 039 571
Consulting Structural & Civil Engineers
233 Johnston Street, Annandale NSW 2038
AUSTRALIA

tel: +61 (2) 9660 4200
fax: +61 (2) 9660 4900
info@spadengineer.com.au
www.spadengineer.com.au

Director: Paheer C Paheerathan
BScEng, MEngSc, MIEAust, CPEng,
NPER (Civil & Structural)

➢ Earthquake Loading	Not considered.
➢ Maximum Pitch	30 degrees.
➢ Aluminum Rails	6005 - T5.
➢ Maximum size of Solar panels	1800x1000

Subject to the following qualifications we certify that the above mentioned frames are structurally adequate and conform to the above Australian standards.

- Each row of solar panels shall have a minimum of two rows of railing fixed to the roof framing.
- The connections between the solar panels shall be flexible to accommodate deflection of the railing.
- The deflection of the railing has not been controlled in the design. If deflection has to be limited then spacing shall be reduced as advised by a practicing structural engineer.
- The installation of the framing shall conform to relevant Australian Standards, Manufacturer's specifications and good building practice.
- The footings shall be founded on stable soil that has a minimum safe baring capacity of 100 kPa. The surrounding shall be adequately drained to prevent undermining and or settlement of the footings.
- The concrete footings shall conform to AS3600.
- The cantilever span of the railing shall not exceed 50% of the adjacent spacing of the installed fixings.
- Dissimilar metals shall be separated with a suitable inert material to prevent galvanic corrosion.
- The installation and fixings shall be periodically inspected and maintained.
- The following are excluded from this certification.
  - x Framing of the solar panel units.
  - x Verification of test certificates for the materials and components.
  - x Load testing and certification.

Should you have any queries please feel free to call Paheer on 9660 4200.

Yours faithfully,
SPAD PTY LTD

C. Pah

Paheer C Paheerathan BScEng, MEngSc, MIEAust, CPEng, NPER (Civil & Structural) 142156
Director

SPAD Pty Ltd ABN 47 090 039 571
Consulting Structural & Civil Engineers
233 Johnston Street, Annandale NSW 2038
AUSTRALIA

Pole Mount AS/NZS 1170.2 Certificate

SPAD
CONSULTING STRUCTURAL AND CIVIL ENGINEERS

28 May 2012

Project number: M137

Xiamen Hopergy Photovoltaic Technology Co. Ltd. (Client)
No. 46 1A Huli Av. Huli District
Xiamen China

Attention :Mr.Hu

Dear Madam,

RE: XIAMEN HOPERGY PHOTOVOLTAIC TECHNOLOGY FOOTINGS FOR GROUND MOUNTED FRAME SUPPORT

As requested, we have reviewed the structural adequacy of the continuous paving slab and individual pad footings for the 'Ground Mounting System I ' prepared by Xiamen Hopergy Photovoltaic Technology.
Hereby we certify that the details and specification of continuous paving slab and individual pad footings provided in drawing HOP-GMIV-BA dated 7 May 2012 prepared by Hopergy are structurally adequate and conform to relevant Australian standards listed below.

Our design investigation is based on the following Australian Standards and sections of Building Code of Australia relevant to structural issues.

- AS1170.0-2002 Structural design Actions Part 0: General principles.
- AS1170.2-2002 Structural design Actions Part 2: Wind actions.
- AS 3600 -2009 Concrete structures.
- AS2870 – 2011 Residential Slabs & Footings.

Our certification is subject to the following qualifications.

- The materials and construction shall conform to AS3600.
- The footings shall be founded on stable soil that has a minimum safe baring capacity of 100 kPa. The soil condition shall be assessed by a suitably qualified person.
- The surrounding shall be adequately drained to prevent undermining and or settlement of the footings. Any softened materials shall be replaced with mass concrete or compacted backfill conforming to AS2870.
- The surrounding ground shall be drained to keep storm water away from the footings.
- The anchors shall be installed in accordance with the manufacturer's written specifications.
- The installation of the framing shall conform to relevant Australian Standards, Manufacturer's specifications and good building practice.
- All works, and safety during construction shall conform to statutory requirements relevant to the site.

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Director: Paheer C Paheerathan
BScEng, MEngSc, MIEAust, CPEng,
NPER (Civil & Structural)

XIAMEN HOPERGY PHOTOVOLTAIC TECHNOLOGY FOOTINGS FOR GROUND MOUNTED FRAME SUPPORT
28 May 2012
Project No. **M137**

SPAD

Following design criteria has been used for the structural verification.

➢ Design Life	25 years.
➢ Importance Level	Type 2: Ordinary.
➢ Annual Probability of exceedance	1/250.
➢ Terrain Category to AS1170.2	2.
➢ Service Deflection	Not limited.
➢ Snow loading	Not considered.
➢ Earthquake Loading	Not considered.
➢ Maximum Pitch	30 degrees.
➢ Aluminum Rails	6005 - T5.
➢ Maximum size of Solar panels	1800x1000

Should you have any queries please feel free to call Paheer on 9660 4200.

Yours faithfully,
SPAD PTY LTD

C. Paheerathan

Paheer C Paheerathan BScEng, MEngSc, MIEAust, CPEng, NPER (Civil & Structural) 142156
Director

HOP-GMI -BA
Figure No
4100 MAX. (X 3000 MAX. LONG)
SOLAR PANEL ARRAY SUPPORTED
ON MINIMUM OF TWO RACKS.
(8 NO. 1460*985 SOLAR PANELS)
FIX TO FOOTINGS WITH:
WIND REGIONS A & B
4-AS1010tH GALV.
'ANKASCREWS' PER POST.
WIND REGION C
4-AS1210tH GALV.
'ANKASCREWS' PER POST.
(OR SIMILAR APPROVED)
T
(Refer Schedule)
Continuous Paving Slab
T (Refer schedule for thickness)
Provide control joints as required
Extend paving slab 1500min.
Beyond last rack leg.
D
(Refer Schedule)
W
(Refer Schedule)
A x B
(Refer Schedule)
X
(Refer Schedule)
Front Leg
Rear Leg
3CM
Step
Size of strip footing
RL1118 TOP & BTM (50 CVR)
Main wires longitudinally
extend strip 1500 min.
Beyond last rack leg.
Size of Pad footing
A mm x B mm x X mm (Refer Schedule)
FOOTING SCHEDULE
Wind Region
Size of strip footing W mm X D mm
Rear Leg
Front Leg
Continuous Paving Slab for site classification A, S, & A1 only
Size of Pad footing A mm x B mm x X mm
Rear Leg
Front Leg
A
500 x 600
500 x 600
170mm
SL92 top & SL82 bot
B
700 x 600
500 x 600
250mm
SL 102 Top & SL 82 bot
1200x1200x650
Top N16 @200 EW
Bot. SL82
600x600x650
SL 82 top & Bot
C
1100 x 600
500 x 600
400mm
R12@300 EW Top
R12@300 EW Bot
Control joints shall be provided as appropriate.
Allow to provide compacted sub base as required to suit ground condition.
Concrete
All construction shall conform to AS3600
Grade 25MPa for Exposure classification A1 & A2.
Exposure Classification
Concrete Grade MPa
Cover
A1, A2
25
B1
32
50mm bot, 40mm top
B2
40
Footings.
All footings and slabs shall bear on stable ground with a safe bearing capacity of 100kPa
Top of all footings shall be 30mm above ground level.
The surrounding area shall be drained away from the footings.
TYPICAL ELEVATION
1:20
Tolerance
Dimension
Tolerance
Dimension
Tolerance
0~3
±0.06
120~250
±0.25
3~10
±0.09
250~400
±0.32
10~50
±0.13
400~1000
±0.45
50~120
±0.19
>1000
±0.80
Version
Date
Amendment
App by
Figure No.
HOP-GMI -BA
Designer
Vincent
Date
2012.5.7
Che by
Material
App by
View
Hopergy

SPAD
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
think lateral

10 November 2011

Project number: M137

Xiamen Hopergy Photovoltaic Technology Co. Ltd. (Client)
No. 46 1A Huli Av. Huli District
Xiamen China

Attention :Mr.Hu

Dear Madam,

RE: XIAMEN HOPERGY PHOTOVOLTAIC TECHNOLOGY AS1170.2 VERIFICATION OF POLE MOUNTED FRAME SUPPORT

As requested, we have reviewed the structural adequacy of the Aluminum support framing and the fixings specified in 'Pole Mounting System Installation Manual' prepared by Xiamen Hopergy Photovoltaic Technology.

We certify that the pole mounted system supporting four (4) solar panels is structurally adequate to be used in the wind region A provided the post size is increased 165x3 CHS.

The certification is subject to the qualifications and criteria listed in this document.

Our design investigation is based on the following Australian Standards and sections of Building Code of Australia relevant to structural issues.

- AS1170.0-2002 Structural design Actions Part 0: General principles.
- AS1170.2-2002 Structural design Actions Part 2: Wind actions.
- AS 1664.1-1997 Aluminum structures Part 1: Limit state design.
- AS 4673-2001 Cold Formed Stainless Steel.
- AS 3566.1-2002 Self-drilling screws for the building and construction industries.
- AS 3566.1-2002 Self-drilling screws for the building and construction industries.
- AS3566.2 – 2002 Part 2: Corrosion resistance requirements.
- ISO3506:1-2009 Mechanical Properties of Corrosion-Resistance Stainless Steel Fasteners.

Following design criteria has been used for the structural verification.

➢ Design Life	25 years.
➢ Importance Level	Type 2: Ordinary.
➢ Annual Probability of exceedance	1/250.
➢ Wind Region to AS 1170.2	A
➢ Terrain Category to AS1170.2	2.
➢ Service Deflection	Not limited.
➢ Snow loading	Not considered.
➢ Earthquake Loading	Not considered.

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- Maximum Pitch 40 degrees.
- Aluminum Rails 6005 - T5.
- Maximum Height of post above ground. 1600
- 165x3 Post Steel Q235
- Maximum size of Solar panels 1800x1000

Subject to the following qualifications we certify that the above mentioned frames are structurally adequate and conform to the above Australian standards.

- Each row of solar panels shall have a minimum of two rows of railing fixed to the roof framing.
- The connections between the solar panels shall be flexible to accommodate deflection of the railing.
- The deflection of the railing has not been controlled in the design. If deflection has to be limited then spacing shall be reduced as advised by a practicing structural engineer.
- The post shall be embedded in a concrete pier founded in stable ground. The footing shall conform to AS2159, and AS2870, and be designed to suit the geotechnical condition of the soil and the imposed wind and gravity loading.
- The installation of the framing shall conform to relevant Australian Standards, Manufacturer's specifications and good building practice.
- The cantilever span of the railing shall not exceed 50% of the adjacent spacing of the installed fixings.
- Dissimilar metals shall be separated with a suitable inert material to prevent galvanic corrosion.
- The installation and fixings shall be periodically inspected and maintained.
- The following are excluded from this certification.
  - x Framing of the solar panel units.
  - x Verification of test certificates for the materials and components.
  - x Load testing and certification.

Should you have any queries please feel free to call Paheer on 9660 4200.

Yours faithfully,
SPAD PTY LTD

C. Pah

Paheer C Paheerathan BScEng, MEngSc, MIEAust, CPEng, NPER (Civil & Structural) 142156
Director

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Our Ref: LTR/10819-2/A/1/AV

24/12/2012

CERTIFICATE

This is to certify that at the request of Xiamen Hopergy Photovoltaic Technology Co., Ltd, Dome Consulting (Aust) Pty Ltd have reviewed the componentry used for the installation of Pole Mounting System (6,8,10 Panels)

The elements which were to be checked include:

- Ø Angle adjustment tubes
- Ø Beams
- Ø Poles
- Ø Tube cap
- Ø Steel tube embrace hoop
- Ø Girders
- Ø Aluminium rail

The check included a review of Region A & B of Australia wind loading conditions including Cyclonic conditions, in accordance to AS1170.2/Amdt2/2012.12.24.

The general arrangement of the rails and supports for regions A & B throughout Australia is to be provided by Xiamen Hopergy Photovoltaic Technology Co., Ltd and to comply with Dome Consulting (Aust) Pty Ltd Structural Report 10819-2-000 Dated 07/01/2013.

The review has determined that all the above mentioned supporting componentry was found to be acceptable.

Should you have any further queries please do not hesitate to contact me.

Yours faithfully,
FOR & ON BEHALF OF DOME CONSULTING PTY LTD

Robert Cilia
BE (Civil) RBP RPEQ TBP

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