INSTALLATION INSTRUCTION

Tile Roof Mounting System







Content

I.	Safety Precautions	3
II.	Introduction	4
III.	Tools	4
IV.	Components	5
۷.	Installation steps	6
5.1	Installation of tile hook	6
5.2	Installation of Rail	7
5.3	Installation of rail splice	8
5.4	Installation of PV modules	9
5.5	Installation of Grounding Lug (Skip this step if not needed)	11
5.6	Installation diagram	12
VI.	Installation Precaution	13
1.1	Notes for the installation dimensions	13
2.1	Notes for Stainless Steel Fasteners	13



I. Safety Precautions

Thank you for purchasing Antai solar mounting system products. Please refer to this installation instruction before installation, operation, maintenance, and inspection.

• General considerations

The installation is limited to those who have professional experience and can carry out construction according to the specified items.

Please abide by the local national or local building regulations and environmental protection regulations. Please comply with the regulations on the prevention of industrial accidents and the relevant regulations of the insurance union.

There must be at least 2 operators during installation to prevent accidents.

Please wear safety clothes. (Especially protective helmets, work boots and gloves). Please always prepare at least one installation work instruction when installing.

When working at heights, please set up scaffolds and carry out construction after eliminating the danger of falling. Please use gloves and seat belts.

■ In order to prevent accidents and failures, please do not arbitrarily change the product style.

- Please pay attention to the profile section and sharp parts, and avoid collision and injury during construction.
- Please pay attention to tightening the bolts, nuts, self-tapping screws, etc. of each part, and pay great attention to whether they are locked.

When working on electrical wiring works, please pay attention not to touch the profile section, which may damage the wiring.

Please do not use damaged, faulty, or deformed products in case injury or accident happens. Please always prepare at least one installation work instruction when installing.

Requirement

- Please use the accessories designated by our company for construction parts, and do not arbitrarily transform and change the products.
- Please avoid hitting strongly on the profile as aluminum profile is easy to deform and scratch.
- This information is related to the installation of the system. Please consider the characteristics of the stand during the construction of the foundation, components, inverter, and electrical wiring.



II. Introduction

Antai tile hook system is a roof photovoltaic mounting system applied to tile roofs. The hooks are designed based on various types tile roofs. In that case, each roof has its corresponding and fitting hook for installation, which greatly improves the firmness of the connection between mounting system and roof structure. Multiple high-quality components and different types of rails can be used for different types tile roof in different countries and regions, while improving the stability of the overall supports. The whole system has fewer mounting accessories, which saves the users' installation time and cost. It is an efficient solution for large-scale tile roof projects.

Please read the installation manual carefully before installation.

		C Z B	
8mm Inner Hexagon Spanner	Electric Drill	Tape Measure	Thin Marker
		·	
Torque Spanner	String	Adjustable Wrench	Socket Spanner(M8)

III. Tools



IV. Components

Main Components							
Tile hook #1	Tile hook #2	Adjustable hook #1	Adjustable hook #2				
	0		6				
Rail 1 (Internal splice)	Rail splice 1	Rail 2 (External splice)	Rail splice 2				
End clamp	Mid clamp	Grounding lug					



V.Installation steps

5.1 Installation of tile hook

Self-tapping screws of tile hook need to be fixed to the roof purlins. Please mark the positions of tile hook according to shop drawing and make sure all tile hooks are installed on the same horizontal line. Then install the tile hooks accordingly and fasten them to the roof purlins by self-tapping screws. Shown as bellow:

5.1.1Mark the positions of tile hook on the roof and make sure they are on the same horizontal line.



Tile hook installation:





5.1.2 Install all hooks to the tile roof.



5.2 Installation of Rail

Fix rails to tile hooks after adjusting the length and height and tighten them by bolts.

5.2.1 Fix tile hook and adjust the rail position, slide T module into specified rail (refer to drawings) and then tighten them by bolts.





5.2.2 Install other rails accordingly.





5.3 Installation of rail splice

Rails should be connected by rail splice if needed, as shown below:

5.3.1 Slide half of the rail splice into the first rail, adjust the fixed position, and tighten the bolts. Then Slide the second rail into the rail splice, tighten them by bolts when leveled.



Above are for TYN53、CG019、TYN28 and others by external rail splices.



Above are for CG010, TYN305A, TYN355 and others by internal rail splices.

5.3.2 Completed installation is as the pic shown below





5.4 Installation of PV modules

According to the installation dimensions of the drawings, place the modules o n the rail, and fix them with end clamps, mid clamps.



5.4.1 Place the PVmodule on the rail and adjust the position according to the drawing. Then fix the end clamp into the rail channel, and tighten the bolts.



5.4.2 After fixing the end clamp of first PV module, please put the second PV module on the rail at proper position. Connecting firmly the first PV module and the second one with mid clamp and fasten the bolts.





5.4.3 If there are earthing clips needed, place them between the PV modules and rails while installing the mid clamps. Adjusting the position to ensure the sharp spikes on earthing clips are pressed by both PV modules. Then tighten the mid clamps by bolts.



5.4.4 Repeat the steps above. When it comes to the last PV module, fix it with the end clamp and tighten with bolts.





5.5 Installation of Grounding Lug (Skip this step if not

needed)

5.5.1 Install grounding lug at the end of the rail as the picture shown below and fix it with bolts.



5.5.2 At the edge of the layout, connect each grounding lug with copper wire, fix the copper wire with M6 bolts, and conduct the end of copper wire to the grounding.





5.6 Installation diagram



Axonometric drawing



VI. Installation Precaution

1. Notes for the installation dimensions

The specific dimensions of all installations involved are subject to the construction drawings. This installation instruction is only for the description of the product installation method.

2. Notes for Stainless Steel Fasteners

Because of the good ductility for stainless steel, the fasteners have big difference with carbon steel one in nature. If use in improper way, it will result in bolt and nut being "locked", which commonly known as "seizure". Prevention from lock basically has the following ways:

2.1. Reduce the Friction Coefficient

(1) Ensure that the bolt thread surface is clean and tidy (No dust, grit, etc.);

(2) It is recommended to use yellow wax or lubricant during installation (such as lubricating grease, 40# engine oil, which are prepared by users).

2.2. Correct Operation Method

(1) The bolt must be perpendicular to the axis of the thread, and not inclined (Do not tighten Obliquely);

(2) In the process of tightening, the strength needs to be balanced, tightening torque shall not exceed the prescribed safety torque value;

(3) Choose torque wrench or socket wrench as far as possible, avoid using adjustable wrench or electric wrench. Lower the rotating speed while have to use electric wrenches;

(4) Avoid using electric wrenches etc. under high temperature conditions, do not rotate fast when using, to avoid rapid rise in temperature and cause "seizure".

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Signature		Signature	-
Name	Yesim Kocabalkan	Name	L. Van Spaandonk
Title	Structural Engineer	Title	Principal Engineer



Our Ref: 10166-09/YK 24 August 2021

ANTAI SOLAR AUSTRALIA PTY LTD Level 1 suite 1.02/309 Pitt St Sydney NSW 2000

PV Array Frame Engineering Certification

<u>RE: AS/NZ 1170.2 Certification for Flush Mounted System on Tile/Tin Roof (Pierced Fix Roof)</u>

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian Building Regulations, have carried out a structural design check of Flush Mounted System on Tile/Tin Roof (Pierced Fix Roof) within Australia. The design check is based on the information and test reports provided by ANTAI SOLAR AUSTRALIA PTY LTD.

Components of the system covered in this certificate shown in the table below:

Component	Part No
Rail	ATL-TYN-305A; ATL-TYN-305B;
Rail Splice	ATL-TYN-304/54
Tin interface	ATL-FWNY-05
Tille Hook	AT-TYN-hook01
Inter Clamp Kit	ATL-FWNY-09; ATL-GN-003
End Clamp Kit	ATL-CG-018

This certificate is **only valid** for Flush Mounted System on Tile/Tin Roof (Pierced Fix Roof) itself. The roof structure or the building structure and PV panels shall be assessed separately and accordingly.

This certificate is **only valid** when fixing into minimum 1.9BMT steel or minimum JD4 seasoned timber. If the fixing condition is different from those conditions, interface spacing shall be reviewed and validated.

This certificate is **only valid** as a whole. Any information extracted from this certificate is not valid if standing alone.



We find the Installation of Flush Mounted System on Tile/Tin Roof (Pierced Fix Roof) for Australian use to be structurally sufficient based on the following conditions:

- Wind loads to AS/NZ1170.2:2011(R2016) Wind actions
- For corrosion effect, ISO 9223:2012 Corrosion of Metals and Alloys
- Wind region **A**, **B**, **C**, **D**
- Wind terrain category 2 & 3
- Wind average recurrence interval of 200 years
- Maximum building height 20m
- The maximum assessed PV panel dimensions are 2300mm x 1200mm
- Weight of the PV panel and array frame to be 15 kg/m²
- Material of Rails to be AL6005-T6
- The spacings are determined based on fixings into minimum JD4 seasoned timber and 1.9mm thick steel purlins
- For purlin thickness t=1.5mm, decrease the spacing to 79%
- For purlin thickness t=1.2mm, decrease the spacing to 70%
- Each PV panel to be installed using **2 rails** minimum in all circumstances
- No PV panel to be installed within 2xs from edges and ridge. "s" is the maximum gap between the underside of the panel and the roof surface when installed on the roof (50mm≤s≤300mm)
- Installation of PV panels to be done in accordance with the PV panels installation manual
- The certification **excludes** assessment of roof structure and PV panels
- For Corrosivity Category C4, decrease the spacing to 92%
- For Corrosivity Category C5, decrease the spacing to 84%

Refer to attached summary table for interface spacing (Unit: mm)

NOTES:

- The recommended spacing nominated in this certification is based on the capacity of the array frame and the fixing of array frames to the roof, not the roof structure and PV panels. It is the responsibility of the installer to adopt the most critical spacing.
- If any of the above conditions cannot be met, the structural engineer must be notified immediately.
- Tile interface is considered reaching its serviceability limit when then unloaded (residual) displacement reach approx. 30% of loaded displacement.
- The capacity of L Feet was obtained from test report no. MT-18/377, dated 16.04.2018 and provided by Melbourne Testing Services.
- The capacity of roof tile hook was obtained from test report no. MY-14/473, dated 04.07.2014 and provided by Melbourne Testing Services.
- The spacing shown in the interface tables shall be adjusted based on the assessment and requirement of the roof structures.



Construction is to be carried out strictly in accordance with the manufacturers instructions. This work was designed by **Yesim Kocabalkan** in accordance with the provisions of Australian Building Regulations and in accordance with sound, widely accepted engineering principles. This certificate is only valid till 24/08/2023. Gamcorp should be contacted for future validation. Contact Gamcorp for customised system or if the site conditions are not covered by this assessment.

Yours faithfully, Gamcorp (Melbourne) Pty Ltd

<u>L. Van [']Spaandonk</u> Principal Engineer FIEAust CPEng NER 5038980 NT Registration: 244137ES QLD Registration: 18703 VIC Registration: PE0001956 TAS Registration: CC7366

Attachments:

- Summary table for interface spacing, Flush mount Tin Roof (Pierced Fix Roof);
- Summary table for interface spacing, Flush mount Tile Roof



Gamcorp (Melbourne) Pty Ltd Consulting Structural & Civil Engineers A.C.N 141 076 904 A.B.N 73 015 060 240

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Structural Design Documentation

Flush Array Frame System Spacing Table For Tile Roof

According to AS/NZS 1170.2-2011 (R2016)

with Rail ATL-TYN-305A within Australia Terrain Category 2 & 3

For: ANTAI SOLAR AUSTRALIA PTY LTD Level 1 suite 1.02/309 Pitt St Sydney NSW 2000

Job Number: Date: 9670-09 18 May 2021



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> ISO 9001:2015 Registered Firm Certificate No: AU1222

Job No:	9670-09
Client:	ANTAI SOLAR AUSTRALIA PTY LTD
Project:	Flush Array Frame System Spacing Table For Tile Roof with Rail ATL-TYN-305A
Address:	within Australia

Australian Standards

AS/NZS 1170.0:2002 – Structural design actions, Part 0: General principles AS/NZS 1170.1:2002 (R2016) – Structural design actions, Part 1: Permanent, imposed and other actions AS/NZS 1170.2:2011 (R2016) – Structural design actions, Part 2: Wind actions AS/NZS 1664.1:1997 – Aluminium structures - Limit state design AS 4100:2020 – Steel Structures AS/NZS 4600:2018 – Cold-formed Steel Structures

Wind Terrain Category:

WTC 2 & 3

Designed:	JD
Checked:	AA

Date: May-21



Client: Project: Designed: **JD**

Relationships built on trust ANTAI SOLAR AUSTRALIA PTY LTD Solar Array Interface Spacing Table Address: within Australia

Job: 9670-09 Date: May-21

Checked: AA

Flush Array Frame System Spacing Table for Tile Roof (mm)

Type of Rail	ATL-TYN-305A
Type of Interface	Tile Interface AT-TYN-hook01
Solar Panel Dimension	2.3mx1.2m
Terrain category	2

Roof Angle (Φ) – Φ < 5°								
Wind		Building Height – H (m)						
Region	H≤5		5 <h≤10< td=""><td colspan="2">10<h≤15< td=""><td colspan="2">15<h≤20< td=""></h≤20<></td></h≤15<></td></h≤10<>		10 <h≤15< td=""><td colspan="2">15<h≤20< td=""></h≤20<></td></h≤15<>		15 <h≤20< td=""></h≤20<>	
	End	Central	End	Central	End	Central	End	Central
Α	880	1110	665	890	610	735	555	690
В	725	980	605	725	450	665	315	630
С		610						
D								

Roof Angle (Φ) -	5°<
Roof Aligie (Ψ) =	$2.2\Delta \ge 20.$

Wind	Building Height – H (m)							
Region	H≤5		5 <h≤10< td=""><td colspan="2">10<h≤15< td=""><td colspan="2">15<h≤20< td=""></h≤20<></td></h≤15<></td></h≤10<>		10 <h≤15< td=""><td colspan="2">15<h≤20< td=""></h≤20<></td></h≤15<>		15 <h≤20< td=""></h≤20<>	
	End	Central	End	Central	End	Central	End	Central
Α	880	1335	665	1065	610	950	555	885
В	725	1175	605	945	450	795	315	725
С		705		595		380		
D		430						

Roof Ang	le (Φ) –		30°≤Φ ≤ €	50°					
Wind	Building Height – H (m)								
Region	H≤	≤5	5 <h< td=""><td>≤10</td><td>10<+</td><td>l≤15</td><td>15<</td><td>1≤20</td></h<>	≤10	10<+	l≤15	15<	1≤20	
	Intermedi ate	Internal	Intermedia te	Internal	Intermedi ate	Internal	Intermedi ate	Internal	
Α	1155	1735	930	1515	785	1335	715	1250	
В	1025	1665	760	1330	680	1175	645	1105	
с	630	1065	340	820		705		665	
D	255	740		615		430		355	



Client: Project: Designed: **JD**

Relationships built on trust ANTAI SOLAR AUSTRALIA PTY LTD Solar Array Interface Spacing Table Address: within Australia

Job: 9670-09 Date: May-21

Checked: AA

Flush Array Frame System Spacing Table for Tile Roof (mm)

Type of Rail	
Type of Interface	
Solar Panel Dimension	
Terrain category	

ATL-TYN-305A Tile Interface AT-TYN-hook01 2.3mx1.2m 3

Roof Angl	е (Ф) –		Φ < 5°					
Wind			Βι	uilding Heig	ıht – H (m			
Region	H	≤5	5 <h< td=""><td>≤10</td><td>10<1</td><td>H≤15</td><td>15<</td><td>l≤20</td></h<>	≤10	10<1	H≤15	15<	l≤20
	End	Central	End	Central	End	Central	End	Central
A	1100	1390	1100	1390	935	1175	760	1030
В	970	1220	970	1220	785	1035	675	910
С	605	725	605	725	355	630		485
D		555		555		270		

Roof Angle (Φ) – 5°≤Φ ≤ 30°

Wind	Building Height – H (m) H≤5 $5 < H ≤ 10$ $10 < H ≤ 15$ $15 < 15 < 15 < 15 < 15 < 15 < 15 < 15 <$							
Region	H	≤5	5 <h< td=""><td>≤10</td><td>10<</td><td>l≤15</td><td>15<ł</td><td>1≤20</td></h<>	≤10	10<	l≤15	15<ł	1≤20
	End	Central	End	Central	End	Central	End	Central
Α	1100	1670	1100	1670	935	1420	760	1235
в	970	1470	970	1470	785	1245	675	1085
С	605	945	605	945	355	740		665
D		665		665		585		330

Roof Angl	е (Ф) –		30°≤Φ ≤ €	50°				
Wind	Building Height – H (m)							
Region	H≤	≤5	5 <h< th=""><th>≤10</th><th>10<+</th><th>l≤15</th><th>15<</th><th>1≤20</th></h<>	≤10	10<+	l≤15	15<	1≤20
	Intermedi ate	Internal	Intermedia te	Internal	Intermedi ate	Internal	Intermedi ate	Internal
Α	1455	1850	1455	1850	1225	1765	1075	1695
В	1275	1780	1275	1780	1080	1700	945	1545
С	760	1330	760	1330	655	1125	595	985
D	595	910	595	910	320	785		690



Client: ANTA Project: Solar Address: within Designed: JD

Relationships built on trust ANTAI SOLAR AUSTRALIA PTY LTD Solar Array Interface Spacing Table within Australia

Job: **9670-09** Date: **May-21**

Checked: AA

General Notes



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	Samonh	
Client: Project:	Relationships built on trust ANTAI SOLAR AUSTRALIA PTY LTD Solar Array Interface Spacing Table	Job: 9670-09 Date: May-21
Address: Designed	within Australia JD	Checked: AA
Note 7	Terrain Category 2 (TC2) refers to open terrain, including obstructions having heights generally from 1.5 m to 5 m, hectare, e.g. farmland and cleared subdivisions with isola Terrain Category 3 (TC3) refers to terrain with numerous heights generally from 3 m to 10 m. The minimum densit equivalent of 10 house-size obstructions per hectare, e.g or dense forests.	grassland, with well-scattered with no more than two obstructions per ated trees and uncut grass. closely spaced obstructions having cy of obstructions shall be at least the . suburban housing, light industrial estates
Note 8	The optimised location of rail splice connection is at quart No Splice connection should be placed at the centre of sp	ter length of the spacing of the interface. acing or over the interface.
	RAIL	



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Structural Design Documentation

Flush Array Frame System Spacing Table For Tile Roof

According to AS/NZS 1170.2-2011 (R2016)

with Rail ATL-TYN-305B within Australia Terrain Category 2 & 3

For: ANTAI SOLAR AUSTRALIA PTY LTD Level 1 suite 1.02/309 Pitt St Sydney NSW 2000

Job Number: Date: 9670-09 18 May 2021



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ISO 9001:2015 Registered Firm Certificate No: AU1222

Job No:	9670-09
Client:	ANTAI SOLAR AUSTRALIA PTY LTD
Project:	Flush Array Frame System Spacing Table For Tile Roof
	with Rail ATL-TYN-305B
Address:	within Australia

Australian Standards

AS/NZS 1170.0:2002 – Structural design actions, Part 0: General principles AS/NZS 1170.1:2002 (R2016) – Structural design actions, Part 1: Permanent, imposed and other actions AS/NZS 1170.2:2011 (R2016) – Structural design actions, Part 2: Wind actions AS/NZS 1664.1:1997 – Aluminium structures - Limit state design AS 4100:2020 – Steel Structures AS/NZS 4600:2018 – Cold-formed Steel Structures

Wind Terrain Category:

WTC 2 & 3

Designed: JD Checked: AA

Date: May-21



Client: Project: Designed: **JD**

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Job: 9670-09 Date: May-21

Checked: AA

Flush Array Frame System Spacing Table for Tile Roof (mm)

Type of Rail	ATL-TYN-305B
Type of Interface	Tile Interface AT-TYN-hook01
Solar Panel Dimension	2.3mx1.2m
Terrain category	2

Roof Angl	е (Ф) –		Φ < 5°					
Wind			Bu	ilding Heig	jht – H (m	ı)	15< End 	
Region	H	≤5	5 <h< td=""><td>≤10</td><td>10<1</td><td>H≤15</td><td>15<ł</td><td>l≤20</td></h<>	≤10	10<1	H≤15	15<ł	l≤20
	End	Central	End	Central	End	Central	End	Central
Α	735	1110	615	740	490	670		630
В	665	980	490	665		610		555
С		490						
D								

Deef Angle (A)	F0 < A < 200
Roul Angle (Ψ) –	2 24 2 20

Wind			Bu	uilding Heig	jht – H (m	ı)		
Region	H	≤5	5 <h< td=""><td>≤10</td><td>10<</td><td>1≤15</td><td>15<</td><td>1≤20</td></h<>	≤10	10<	1≤15	15<	1≤20
	End	Central	End	Central	End	Central	End	Central
A	735	1335	615	1065	490	830		740
В	665	1175	490	830		700		665
С		645		440				
D								

Roof Ang	le (Φ) –		30°≤Φ ≤ €	50°					
Wind	Building Height – H (m)								
Region	H≤	≤5	5 <h< td=""><td>≤10</td><td>10<+</td><td>l≤15</td><td>15<</td><td>1≤20</td></h<>	≤10	10<+	l≤15	15<	1≤20	
	Intermedi ate	Internal	Intermedia te	Internal	Intermedi ate	Internal	Intermedi ate	Internal	
Α	1155	1685	805	1515	690	1335	655	1250	
В	1025	1610	690	1330	630	1175	605	1105	
С	580	1065		715		645		615	
D		680		490					



Client: Project: Designed: **JD**

Relationships built on trust ANTAI SOLAR AUSTRALIA PTY LTD Solar Array Interface Spacing Table Address: within Australia

Job: 9670-09 Date: May-21

Checked: AA

Flush Array Frame System Spacing Table for Tile Roof (mm)

Type of Rail	
Type of Interface	
Solar Panel Dimension	
Terrain category	

ATL-TYN-305B Tile Interface AT-TYN-hook01 2.3mx1.2m 3

Roof Angl	е (Ф) –		Φ < 5°						
Wind		Building Height – H (m)							
Region	H	≤5	5 <h< td=""><td>≤10</td><td>10<1</td><td>1≤15</td><td>15<ł</td><td>1≤20</td></h<>	≤10	10<1	1≤15	15<ł	1≤20	
	End	Central	End	Central	End	End Central		Central	
Α	1100	1390	1100	1390	815	1175	690	1030	
В	970	1220	970	1220	690	1035	620	760	
С	490	665	490	665		595			
D		365		365					

Roof Angle (Φ) – 5°≤Φ ≤ 30°

Wind		Building Height – H (m)								
Region	H	≤5	5 <h≤10< td=""><td colspan="2">10<h≤15< td=""><td colspan="2">15<h≤20< td=""></h≤20<></td></h≤15<></td></h≤10<>		10 <h≤15< td=""><td colspan="2">15<h≤20< td=""></h≤20<></td></h≤15<>		15 <h≤20< td=""></h≤20<>			
	End	Central	End	Central	End	Central	End	Central		
Α	1100	1610	1100	1610	815	1420	690	1235		
В	970	1470	970	1470	690	1245	620	1085		
С	490	830	490	830		675		610		
D		615		615		400				

Roof Ang	$le (\Phi) - 30^{\circ} \le \Phi \le 60^{\circ}$								
Wind		Building Height – H (m)							
Region	H≤5		5 <h≤10< th=""><th>10<+</th><th>l≤15</th><th>15<</th><th>l≤20</th></h≤10<>		10<+	l≤15	15<	l≤20	
	Intermedi ate	Internal	Intermedia te	Internal	al Intermedi Internal Intermedi ate		Internal		
Α	1455	1805	1455	1805	1225	1720	1075	1640	
В	1275	1735	1275	1735	1080	1645	830	1545	
С	690	1330	690	1330	610	1125	440	985	
D	450	905	450	905		705		630	



Client: ANTA Project: Solar Address: within Designed: JD

Relationships built on trust ANTAI SOLAR AUSTRALIA PTY LTD Solar Array Interface Spacing Table within Australia

Job: **9670-09** Date: **May-21**

Checked: AA

General Notes



Client: Project:	Relationships built on trust ANTAI SOLAR AUSTRALIA PTY LTD Solar Array Interface Spacing Table	Job: Date:	9670-09 May-21
Designed	JD	Checked	d: AA
Note 7	Terrain Category 2 (TC2) refers to open terrain, including obstructions having heights generally from 1.5 m to 5 m, hectare, e.g. farmland and cleared subdivisions with isola Terrain Category 3 (TC3) refers to terrain with numerous heights generally from 3 m to 10 m. The minimum densit equivalent of 10 house-size obstructions per hectare, e.g. or dense forests.	grassland, with no mo ited trees an closely spa y of obstruct suburban	with well-scattered ore than two obstructions per nd uncut grass. ced obstructions having ctions shall be at least the housing, light industrial estates
NOTE 8	No Splice connection should be placed at the centre of spa	acing or ove	er the interface.
	-RAIL -SP CO	LICE	
			LFEET



Relationships built on trust





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Author Signature		Approver Signature	
Name	Yesim Kocabalkan	Name	L. Van Spaandonk
Title	Structural Engineer	Title	Principal Engineer



Our Ref: 10341/YK 23 September 2021

ANTAI SOLAR AUSTRALIA PTY LTD Level 1 suite 1.02/309 Pitt St Sydney NSW 2000

Addendum Letter

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian Building Regulations, have carried out an assessment for 2.3mx1.2m and 2.2mx1.2m PV panels when using 2 or 3 rails per PV panel associated with PV array frame engineering certifications which were issued by Gamcorp.

We find the spacing can be adjusted/increased as per the tables below when the panel sizes and the number of rails are different from the certificates as referenced in the next page.

0	Region A							
Case 1	Number of rails per panel	Panel length x width (m)	Spacing					
Central zone	3	2.3m x 1.2m	+ 10%					
End zone	3	2.3m x 1.2m	+ 35%					
	Regi	ion B,C and D						
	Number of rails per panel	Panel length x width (m)	Spacing					
All zones	3	2.3m x 1.2m	+ 50%					
()	Region A							
Case 2	Number of rails per panel	Panel length x width (m)	Spacing					
Central zone	3	≤2.2m x 1.2m	+ 12%					
End zone	3	≤2.2m x 1.2m	+ 39%					
	Regi	ion B,C and D						
	Number of rails per panel	Panel length x width (m)	Spacing					
All zones	3	≤2.2m x 1.2m	+ 55%					
(Regio	n A, B, C and D						
Case 3	Number of rails per panel	Panel length x width (m)	Spacing					
All zones	2	≤2.2m x 1.2m	+ 5%					

Table 1 - Flush mount solar installation

Table 2 - Tilt mounted solar installation

	Regio	n A, B, C and D	
	Number of rails per panel	Panel length x width (m)	Spacing
All zones	2	≤2.2m x 1.2m	+ 5%



This addendum letter to be used in relation to the certificates listed below:

10166-01 - General Certificate - Flush Mount _ Tile or Tin Roof (Pierced Fix Roof)
10166-02 - General Certificate - Tilt Mount Solar System For Tin Roof (Pierced Fix Roof)
10166-03-01-General Certificate - Flush Mount - Lysaght Klip Lok 700 High Strength
10166-03-02-General Certificate - Flush Mount _ Lysaght Klip Lok 406
10166-03-03-General Certificate - Flush Mount Solar System For Lysaght Longline 305
10166-04-01-General Certificate - Tilt Mount - Lysaght Klip Lok 700 Hi
10166-04-02-General Certificate - Tilt Mount - Lysaght Klip Lok 406
10166-04-03-General Certificate - Tilt Mount - Lysaght Longline 305
10166-05 - General Certificate - Flush Mount _ Tile or Tin Roof (Pierced Fix Roof)
10166-06 - General Certificate - Tilt Mount Solar System For Tin Roof (Pierced Fix Roof)
10166-07-01-General Certificate - Flush Mount - Klip Lok 700 Hi
10166-07-02-General Certificate - Flush Mount _ Lysaght Klip Lok 406
10166-07-03-General Certificate - Flush Mount Solar System For Lysaght Longline 305
10166-08-01-General Certificate - Tilt Mount - Lysaght Klip Lok 700 Hi
10166-08-02-General Certificate - Tilt Mount - Lysaght Klip Lok 406
10166-08-03-General Certificate - Tilt Mount - Lysaght Longline 305
10166-09 - General Certificate - Flush Mount _ Tile or Tin Roof (Pierced Fix Roof)
10166-10 - General Certificate - Tilt Mount Solar System For Tin Roof (Pierced Fix Roof)
10166-11-01-General Certificate - Flush Mount - Klip Lok 700 Hi
10166-11-02-General Certificate - Flush Mount _ Lysaght Klip Lok 406
10166-11-03-General Certificate - Flush Mount Solar System For Lysaght Longline 305
10166-12-01-General Certificate - Tilt Mount - Lysaght Klip Lok 700 Hi
10166-12-02-General Certificate - Tilt Mount - Lysaght Klip Lok 406
10166-12-03-General Certificate - Tilt Mount - Lysaght Longline 305

Construction is to be carried out strictly in accordance with the manufacturers instructions. This work was designed by **Yesim Kocabalkan** in accordance with the provisions of Australian Building Regulations and in accordance with sound, widely accepted engineering principles. This letter is only valid till 23/09/2023. Gamcorp should be contacted for future validation. Contact Gamcorp for customised system or if the site conditions are not covered by this assessment.

Yours faithfully, Gamcorp (Melbourne) Pty Ltd

L. Van Spaandonk Principal Engineer FIEAust CPEng NER 5038980 NT Registration: 244137ES QLD Registration: 18703 VIC Registration: PE0001956 TAS Registration: CC7366