

General Certification for Titanergy Tilt Mounted System on Concealed Fix Roof with Titan Solar TTV2 Rail

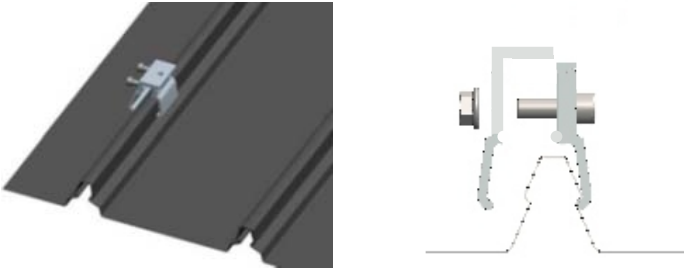
For: JIANGYIN TITANERGY CO. LTD
No.11 Wuxiang Road
Yunting Street, Jiangyin
China 214422

Job No.: 11323-RM08
Date: 30/06/2022

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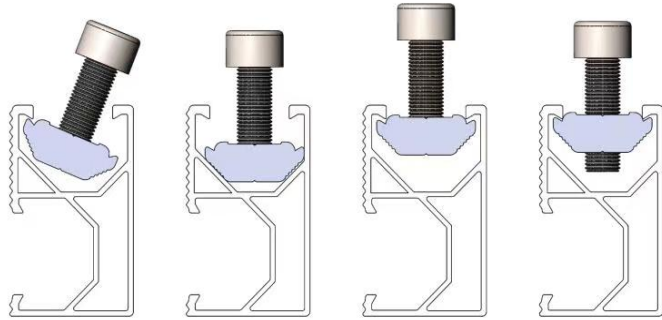
Installation

Install on Tin Roof	
1. Connect KlipLok Interface to the roof tightly. ※ Torsion:23-25N.m	
2. Fix Tin roof hook/Front leg/Rear leg/ Triangle on KlipLok ※ Kliplok406:using 1pc bolts and nuts ※ Torsion:23-25N.m	

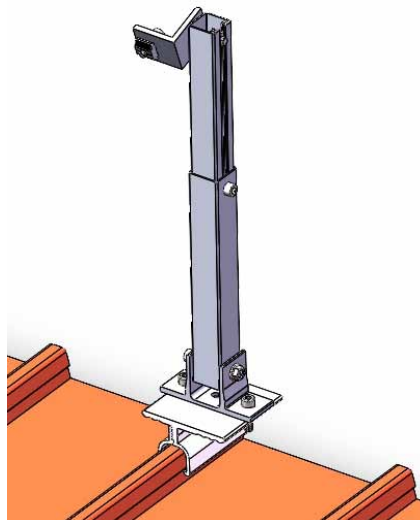
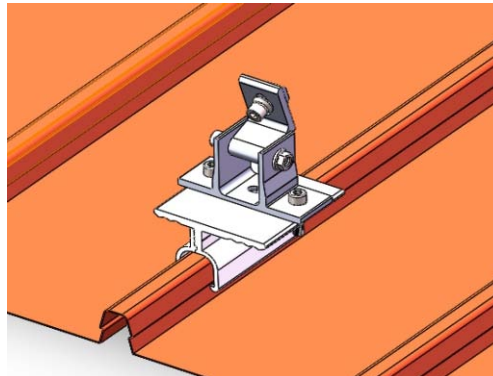
Install The TTV2-Rail

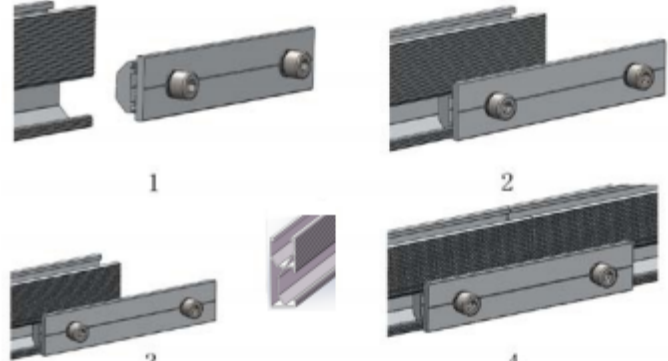
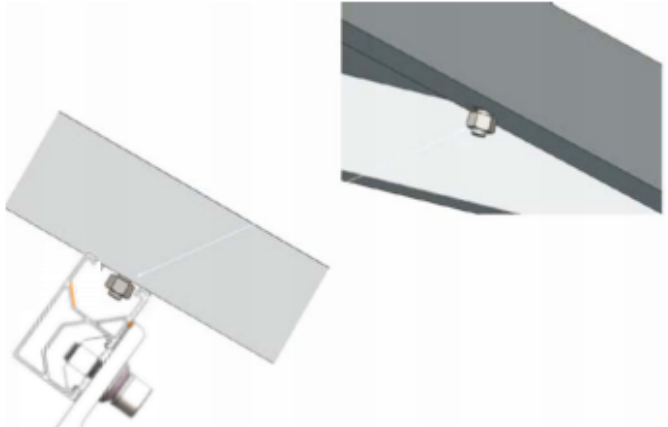
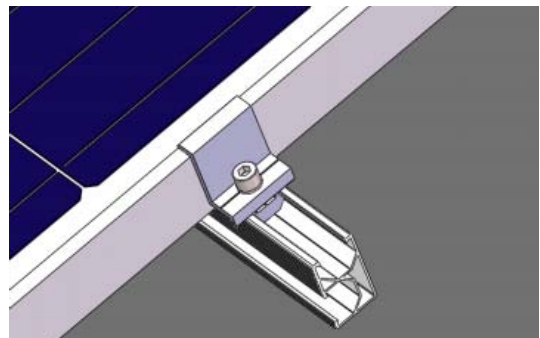
3. D-Module quick mount.

Four steps to quick mount the D-Module into TTV2-Rail channel. Move the assembly to it's desired final position, and fastens firmly in place by torque bolt to 10Nm.



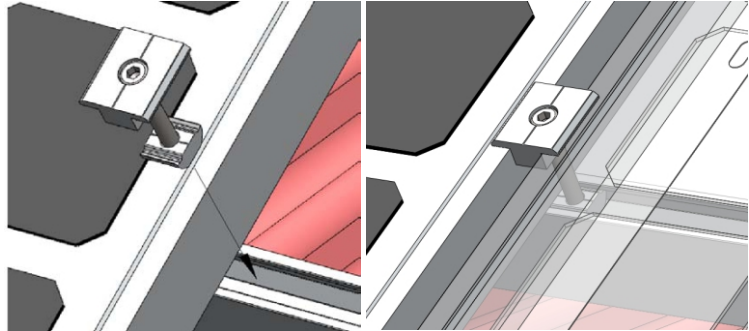
4. Fix the front leg and rear leg to the cliplok.



5. TTV2 Rail connect (with toothed gears) a. Put the TTV2 Rail Splice into the side channel of the TTV2 Rail about 75mm, then fasten the M8 Bolt. b. Put the other TTV2 Rail into the other side of the TTV2 Rail Splice and fasten the other M8 bolt. ※ Torsion:23-25N.m	
Install the module 6. Installing anti-slip protection The anti-slip protection is only necessary on the lowermost row of modules. At first, fit two bolts M6*20 and nuts into the lower holes of each module. Then place the first module of the bottom row so that the anti-slip protection sits in the rail channel of the lowest row of rails ※ Torsion:23-25N.m	
7. Fixing the outer modules by End clamp. a. Put the end clamp kit into the top channel of the TTV2-Rail as the step 3. b. Push the side of module to firmly against the end clamp and then fasten the bolt. ※ Torsion:23-25N.m	

8. Fixing the inter modules by inter clamp.
 - a. Put the inter clamp kit into the top channel of the TTV2-Rail as the step 3.
 - b. Push the Inter-module clamp firmly against the already fixed module.
 - c. Push the next module against the other side of the module-inter clamp.
 - d. Tighten the bolt

※ Torsion:23-25N.m



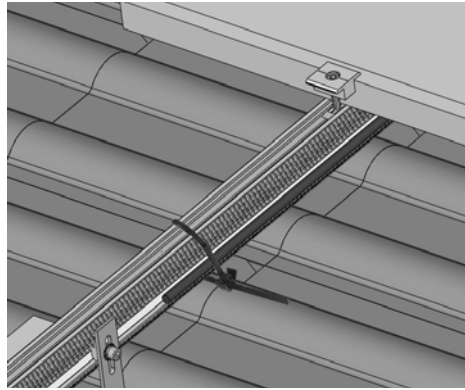
9. Installing the further rows of modules



Cable tie and Grounding

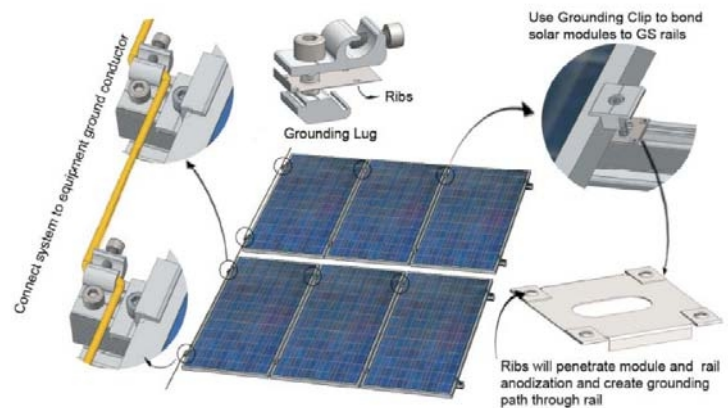
10. Tie cable with the rail

- a. Tie the cable with the rail using the zip tie



11. Grounding

Please see the Titan Solar Grounding System Installation Guide.



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Report Title		General Certification for Titanergy Tilt Mounted System on Concealed Fix Roof with Titan Solar TTV2 Rail				
Document ID		11323-RM08/BL		Job No.	11323	
File Path		G:\Shared drives\11000\11300 - 11399\11323\03 CERTIFICATION				
Client		JIANGYIN TITANERGY CO. LTD		Client Contact	Tina Nie	
Rev	Date	Revision Details	Prepared By	Author	Verifier	Approver
0	30/06/2022	First Issue	BL	BL	AA	LvS
Current Revision		0				

Approval			
Author Signature	<i>baincaliu</i>	Approver Signature	
Name	Bianca Liu	Name	L. Van Spaandonk
Title	Structural Engineer	Title	Principal Engineer

Our Ref: 11323-RM08/BL
30 June 2022

JIANGYIN TITANERGY CO. LTD

No.11 Wuxiang Road
Yunting Street, Jiangyin
China 214422

RE: General Certification for Titanergy Tilt Mounted System on Concealed Fix Roof (Lysaght Klip Lok 406, Lysaght Klip Lok 700 Classic, Lysaght Klip Lok 700 Hi-Strength, Stramit Speed Deck Ultra 700) with Titan Solar TTV2 Rail

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian Building Regulations, have carried out a structural design check of Titanergy Tilt Mounted System on Concealed Fix Roof with Titan Solar TTV2 rail within Australia. The design check has been based on the information and test reports provided by JIANGYIN TITANERGY CO. LTD.

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

Component	Part No.
Rail	Titan Solar TTV2 Rail
Roof Clamp	Titan Solar Cliplok 406 & 700
Mid Clamp	Titan Solar Mid Clamp Kit 40mm
End Clamp	Titan Solar End Clamp Kit 40mm
Tilt Roof System	Titan Solar Tilt Roof System

This certificate is **only valid** for Titanergy Tilt Mounted System on the Concealed Fix Roof (Lysaght Klip Lok 406, Lysaght Klip Lok 700 Classic, Lysaght Klip Lok 700 Hi-Strength, Stramit Speed Deck Ultra 700) with Titan Solar TTV2 rail. The roof structure or the building structure shall be assessed separately and accordingly.

This certificate is **only valid** when roof clamp fixing to the full rib of roof sheeting on the top of the purlins. If the fixing condition is different from those conditions, interface spacing shall be reviewed and validated. For the indicative location of **full rib** in the roof sheeting, please see **Figure 1**.

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 Tilt Mounted System on the Concealed Fix Roof (Lysaght Klip Lok 406, Lysaght Klip Lok 700 Classic, Lysaght Klip Lok 700 Hi-Strength, Stramit Speed Deck Ultra 700) for Australian use to be structurally sufficient based on the following conditions:

- Wind loads to **AS/NZS1170.2:2021**
- Wind region **A, B1, B2, C & D**
- Wind terrain category **2 & 3**
- Wind average recurrence interval of **200 years**
- Maximum building height **20m**
- The PV panel dimensions to be **1800mm x 1100mm, 2000mm x 1100mm, 2200mm x 1200mm, 2400mm x 1200mm**
- Maximum weight of the PV panel and array frame to be **15 kg/m²**
- Rails to be **Titan Solar TTV2** rails

- Roof clamp to be **Cliplok 406** and **700**
- Material of rails and other components to be **AL/6005-T5** UNO
- 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 ($50\text{mm} \leq s \leq 300\text{mm}$)
- 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

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.
- The capacity of roof clamp was obtained from test report no. 10038/Acha, dated 16th July 2020 and provided by Gamcorp (Melbourne) Pty Ltd.
- The capacities of tilt legs were obtained from test report no. 21-0685, dated 12th August 2021 and provided by Melbourne Testing Service(MTS).
- The spacing shown in the interface tables shall be adjusted based on the assessment and requirement of the roof structures.

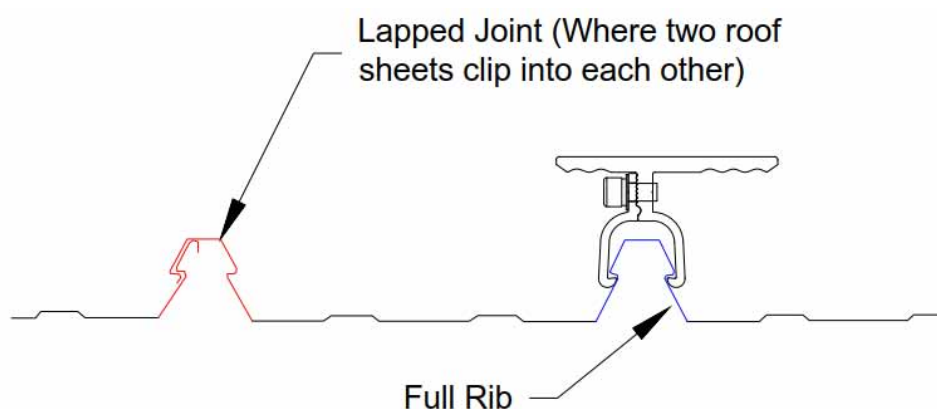


Figure 1 – Full Rib Location For Indicative

Construction is to be carried out strictly in accordance with the manufacturer's instructions. This work was designed by **Bianca Liu** in accordance with the provisions of Australian Building Regulations and in accordance with sound, widely accepted engineering principles.

This certification is only valid till **30/06/2024**. Gamcorp should be contacted for future validation. Contact Gamcorp for a 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

Attachments:

- Summary table for interface spacing - tilt mount installation on Lysaght Klip Lok 406 roof with Titan Solar TTV2 rail
- Summary table for interface spacing - tilt mount installation on Lysaght Klip Lok 700 Classic roof with Titan Solar TTV2 rail
- Summary table for interface spacing - tilt mount installation on Lysaght Klip Lok 700 Hi-Strength roof with Titan Solar TTV2 rail
- Summary table for interface spacing - tilt mount installation on Stramit Speed Deck Ultra 700 roof with Titan Solar TTV2 rail

Structural Design Documentation

Tilt Array Frame System Spacing Table

According to AS/NZS 1170.2-2021

with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
within Australia
Terrain Category 2 & 3

For: Jiangyin Titanergy Co. Ltd
No.11 Wuxiang Road
Yunting Street, Jiangyin
China 214422

Job Number: 11323-RM08a
Date: 30 June 2022



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Job No: 11323-RM08a
Client: Jiangyin Titanergy Co. Ltd
Project: Tilt Array Frame System Spacing Table
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: within Australia
Wind Terrain Category: Terrain Category 2 & 3

Australian/New Zealand 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 1170.2:2021	Structural design actions Part 2: Wind actions
AS/NZS 1664.1:1997 (R2020)	Aluminium structures Part 1: Limit state design
AS/NZS 4600:2018	Cold-formed steel structures
AS 4100:2020	Steel structures

Designed: BL
Checked: AA
Date: Jun-22

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Client: **Jiangyin Titanenergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: **within Australia**

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 406
Solar Panel Dimension	1.8mx1.1m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Wind angle to roof surface (α), $\alpha = 15^\circ$															
	Building Height - h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal
A	430	660	900	1415	430	660	900	1415	370	565	770	1205	--	505	685	1070
B1	--	490	665	1035	--	490	665	1035	--	420	570	885	--	380	510	790
B2	--	395	540	830	--	395	540	830	--	--	465	715	--	--	415	635
C	--	--	385	590	--	--	385	590	--	--	--	510	--	--	--	455
D	--	--	--	415	--	--	--	415	--	--	--	335	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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Client: **Jiangyin Titanenergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: **within Australia**

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 406
Solar Panel Dimension	1.8mx1.1m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: **within Australia**

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 406
Solar Panel Dimension	2mx1.1m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height – h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal
A	385	590	810	1275	385	590	810	1275	--	510	695	1085	--	455	620	960
B1	--	440	600	930	--	440	600	930	--	380	515	795	--	--	460	710
B2	--	310	485	750	--	310	485	750	--	--	415	640	--	--	370	570
C	--	--	--	530	--	--	--	530	--	--	--	455	--	--	--	405
D	--	--	--	375	--	--	--	375	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: **within Australia**

Job: **11323-RM08a**
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Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 406
2mx1.1m
2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: **within Australia**

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 406
Solar Panel Dimension	2.2mx1.2m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: **within Australia**

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 406
Solar Panel Dimension	2.2mx1.2m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanenergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
Address: **within Australia**

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 406
Solar Panel Dimension	2.4mx1.2m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
 Address: **within Australia**

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
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Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 406 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 406
Solar Panel Dimension	2.4mx1.2m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 406 Roof
within Australia
Address:

Job: **11323-RM08a**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

General Notes

Note 1 Following components are satisfied to use according to AS/NZS 1170.2:2021

Components	Part Number	Description
Rail	Titan Solar TTV2 Rail	As per drawing or test report provided by client
Mid Clamp	Mid Clamp Kit 40mm	
End Clamp	End Clamp Kit 40mm	
Roof Clamp	Titan Solar Cliplok 406	
Tilt Roof System	Titan Solar Tilt Roof System	

Note 2 Spacing calculated based on the roof clamp test results.

Note 3 Maximum uplift wind pressure is limited to 5kPa.

Note 4 Deflection is limited to Minimum of $L/120$ and 15mm.

Note 5 Tilt angle is measured from roof surface.

Note 6 "—" states NOT SUITABLE FOR INSTALLATION.

Note 7 Refer section 4.2.1 of AS/NZS 1170.2:2021 for terrain category definition.

Note 8 Wind regions are shown in Figure 3.1(A) of AS/NZS 1170.2:2021.

Note 9 Building height is average roof height of structure above ground. Refer Figure 1 for definition of h, d and b.

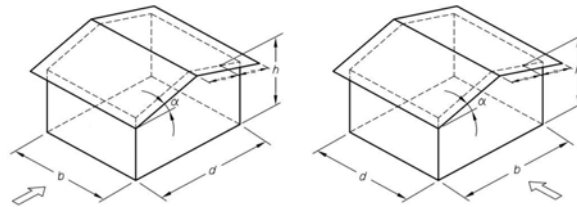
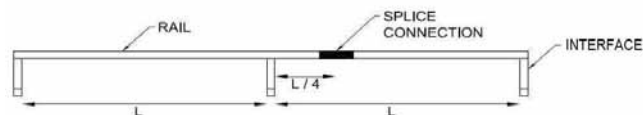


Figure 1 – h, d and b definition

Note 10 Rail splice connection must be placed a quarter length of the spacing of interface. No Splice connection should be placed at the centre of spacing or over the interface.



Note 11 Refer Figure 2 for definition of roof zones.

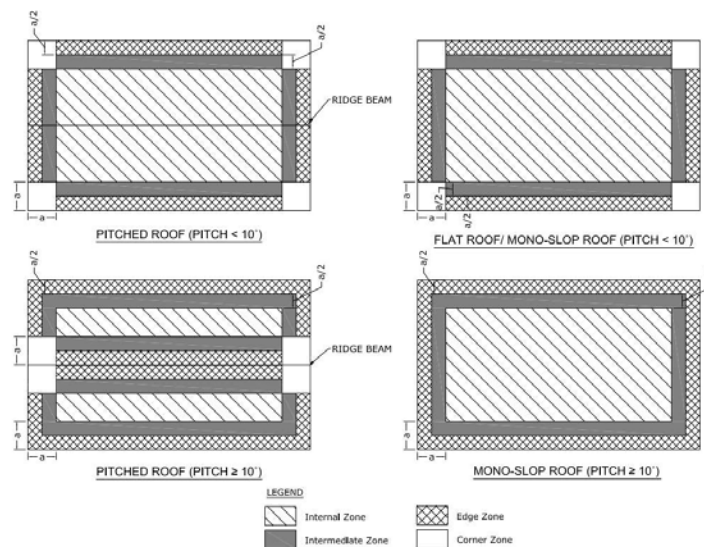


Figure2- Roof Zones Definition

In Figure 2, the value of dimension "a" is the minimum of $0.2b$ or $0.2d$, if (h/b) or $(h/d) \geq 0.2$; or $2h$ if both (h/b) and $(h/d) < 0.2$ (b & d are building dimensions and h is average roof height, see Figure 1)

Structural Design Documentation

Tilt Array Frame System Spacing Table

According to AS/NZS 1170.2-2021

with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
within Australia
Terrain Category 2 & 3

For: Jiangyin Titanergy Co. Ltd
No.11 Wuxiang Road
Yunting Street, Jiangyin
China 214422

Job Number: 11323-RM08b
Date: 30 June 2022



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Job No: 11323-RM08b
Client: Jiangyin Titanergy Co. Ltd
Project: Tilt Array Frame System Spacing Table
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
Address: within Australia
Wind Terrain Category: Terrain Category 2 & 3

Australian/New Zealand 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 1170.2:2021	Structural design actions Part 2: Wind actions
AS/NZS 1664.1:1997 (R2020)	Aluminium structures Part 1: Limit state design
AS/NZS 4600:2018	Cold-formed steel structures
AS 4100:2020	Steel structures

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Client: **Jiangyin Titanergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
 Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	1.8mx1.1m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height - h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal
A	605	925	1265	1555	605	925	1265	1555	520	795	1085	1470	465	710	965	1405
B1	450	690	935	1460	450	690	935	1460	390	595	805	1250	--	535	720	1110
B2	--	560	760	1170	--	560	760	1170	--	485	655	1005	--	430	585	895
C	--	400	540	830	--	400	540	830	--	--	470	715	--	--	420	640
D	--	--	385	585	--	--	385	585	--	--	--	505	--	--	--	450

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	1.8mx1.1m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2mx1.1m
3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	The angle to roof surface (α), $\alpha \leq 45^\circ$															
	Building Height - h (m)															
	h $\leq$ 5				5<h $\leq$ 10				10<h $\leq$ 15				15<h $\leq$ 20			
	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal
A	545	835	1140	1505	545	835	1140	1505	470	720	975	1420	420	640	870	1355
B1	405	620	845	1310	405	620	845	1310	--	535	725	1125	--	480	650	1000
B2	--	505	680	1055	--	505	680	1055	--	435	590	905	--	390	525	805
C	--	355	485	745	--	355	485	745	--	--	420	645	--	--	375	575
D	--	--	--	525	--	--	--	525	--	--	--	455	--	--	--	405

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2mx1.1m
2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
 Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.2mx1.2m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height – h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	495	755	1035	1455	495	755	1035	1455	425	650	885	1375	--	580	790	1230
B1	--	565	765	1190	--	565	765	1190	--	485	660	1020	--	435	590	910
B2	--	460	620	960	--	460	620	960	--	390	535	820	--	--	475	730
C	--	--	440	680	--	--	440	680	--	--	--	585	--	--	--	520
D	--	--	--	480	--	--	--	480	--	--	--	415	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.2mx1.2m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Relationships built on trust

Client: **Jiangyin Titanergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
 with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
 Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.4mx1.2m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
 with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
 Address: **within Australia**

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok Classic 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.4mx1.2m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok Classic 700 Roof
within Australia
Address:

Job: **11323-RM08b**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

General Notes

Note 1 Following components are satisfied to use according to AS/NZS 1170.2:2021

Components	Part Number	Description
Rail	Titan Solar TTV2 Rail	As per drawing or test report provided by client
Mid Clamp	Mid Clamp Kit 40mm	
End Clamp	End Clamp Kit 40mm	
Roof Clamp	Titan Solar Cliplok 700	
Tilt Roof System	Titan Solar Tilt Roof System	

Note 2 Spacing calculated based on the roof clamp test results.

Note 3 Maximum uplift wind pressure is limited to 5kPa.

Note 4 Deflection is limited to Minimum of $L/120$ and 15mm.

Note 5 Tilt angle is measured from roof surface.

Note 6 "—" states NOT SUITABLE FOR INSTALLATION.

Note 7 Refer section 4.2.1 of AS/NZS 1170.2:2021 for terrain category definition.

Note 8 Wind regions are shown in Figure 3.1(A) of AS/NZS 1170.2:2021.

Note 9 Building height is average roof height of structure above ground. Refer Figure 1 for definition of h, d and b.

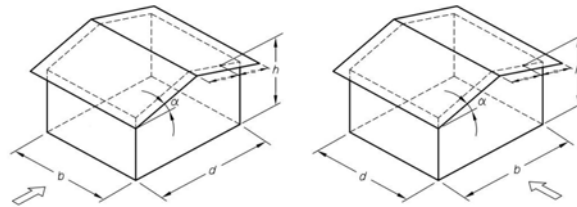
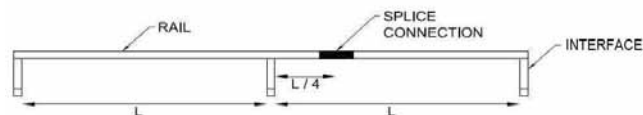


Figure 1 – h, d and b definition

Note 10 Rail splice connection must be placed a quarter length of the spacing of interface. No Splice connection should be placed at the centre of spacing or over the interface.



Note 11 Refer Figure 2 for definition of roof zones.

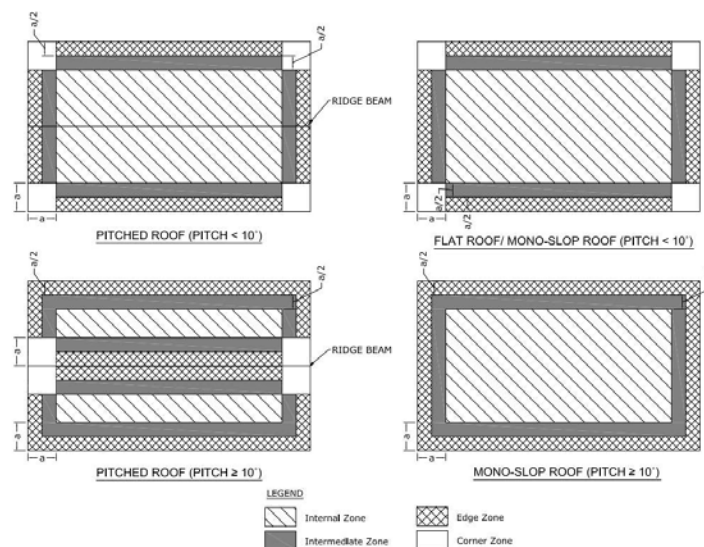


Figure2- Roof Zones Definition

In Figure 2, the value of dimension "a" is the minimum of $0.2b$ or $0.2d$, if (h/b) or $(h/d) \geq 0.2$; or $2h$ if both (h/b) and $(h/d) < 0.2$ (b & d are building dimensions and h is average roof height, see Figure 1)

Structural Design Documentation

Tilt Array Frame System Spacing Table

According to AS/NZS 1170.2-2021

with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
within Australia
Terrain Category 2 & 3

For: Jiangyin Titanergy Co. Ltd
No.11 Wuxiang Road
Yunting Street, Jiangyin
China 214422

Job Number: 11323-RM08c
Date: 30 June 2022



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Job No: 11323-RM08c
Client: Jiangyin Titanergy Co. Ltd
Project: Tilt Array Frame System Spacing Table
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
Address: within Australia
Wind Terrain Category: Terrain Category 2 & 3

Australian/New Zealand 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 1170.2:2021	Structural design actions Part 2: Wind actions
AS/NZS 1664.1:1997 (R2020)	Aluminium structures Part 1: Limit state design
AS/NZS 4600:2018	Cold-formed steel structures
AS 4100:2020	Steel structures

Designed: BL
Checked: AA
Date: Jun-22

Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
 Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	1.8mx1.1m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height - h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal
A	575	885	1210	1555	575	885	1210	1555	495	760	1035	1470	445	680	925	1405
B1	430	660	895	1390	430	660	895	1390	375	570	770	1190	--	510	690	1060
B2	--	535	725	1120	--	535	725	1120	--	460	625	960	--	415	555	855
C	--	385	515	790	--	385	515	790	--	--	445	685	--	--	400	610
D	--	--	365	560	--	--	365	560	--	--	--	480	--	--	--	430

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Relationships built on trust

Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
 Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	1.8mx1.1m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
 Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2mx1.1m
3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height - h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal
A	520	795	1085	1505	520	795	1085	1505	445	685	930	1420	400	610	830	1295
B1	390	595	805	1250	390	595	805	1250	--	510	690	1070	--	460	620	955
B2	--	480	650	1005	--	480	650	1005	--	415	560	865	--	370	500	770
C	--	--	465	710	--	--	465	710	--	--	400	615	--	--	355	550
D	--	--	--	505	--	--	--	505	--	--	--	435	--	--	--	385

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
 Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2mx1.1m
2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanenergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2.2mx1.2m
3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	The angle to roof surface (α), $\alpha \leq 15^\circ$															
	Building Height - h (m)															
	h $\leq$ 5				5<h $\leq$ 10				10<h $\leq$ 15				15<h $\leq$ 20			
	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal
A	470	725	990	1455	470	725	990	1455	405	625	845	1325	--	555	755	1175
B1	--	540	730	1140	--	540	730	1140	--	465	630	975	--	415	560	865
B2	--	435	590	915	--	435	590	915	--	--	510	785	--	--	455	700
C	--	--	420	645	--	--	420	645	--	--	--	560	--	--	--	500
D	--	--	--	455	--	--	--	455	--	--	--	390	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
 Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2.2mx1.2m
2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Relationships built on trust

Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
 Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.4mx1.2m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Relationships built on trust

Client: **Jiangyin Titanenergy Co. Ltd**
 Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
 Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for LYSAGHT Klip-Lok 700 Hi-Strength Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.4mx1.2m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with Titan Solar TTV2 Rail – LYSAGHT Klip-Lok 700 Hi-Strength Roof
Address: **within Australia**

Job: **11323-RM08c**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

General Notes

Note 1 Following components are satisfied to use according to AS/NZS 1170.2:2021

Components	Part Number	Description
Rail	Titan Solar TTV2 Rail	As per drawing or test report provided by client
Mid Clamp	Mid Clamp Kit 40mm	
End Clamp	End Clamp Kit 40mm	
Roof Clamp	Titan Solar Cliplok 700	
Tilt Roof System	Titan Solar Tilt Roof System	

Note 2 Spacing calculated based on the roof clamp test results.

Note 3 Maximum uplift wind pressure is limited to 5kPa.

Note 4 Deflection is limited to Minimum of $L/120$ and 15mm.

Note 5 Tilt angle is measured from roof surface.

Note 6 "—" states NOT SUITABLE FOR INSTALLATION.

Note 7 Refer section 4.2.1 of AS/NZS 1170.2:2021 for terrain category definition.

Note 8 Wind regions are shown in Figure 3.1(A) of AS/NZS 1170.2:2021.

Note 9 Building height is average roof height of structure above ground. Refer Figure 1 for definition of h, d and b.

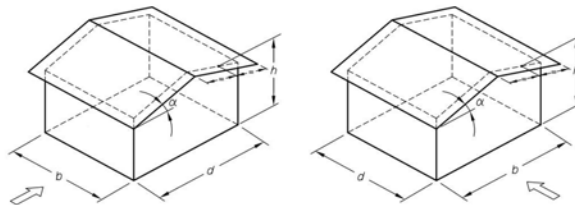
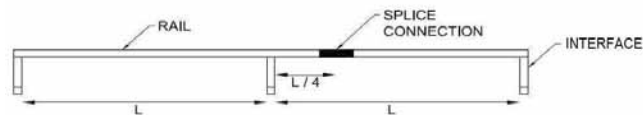


Figure 1 – h, d and b definition

Note 10 Rail splice connection must be placed a quarter length of the spacing of interface. No Splice connection should be placed at the centre of spacing or over the interface.



Note 11 Refer Figure 2 for definition of roof zones.

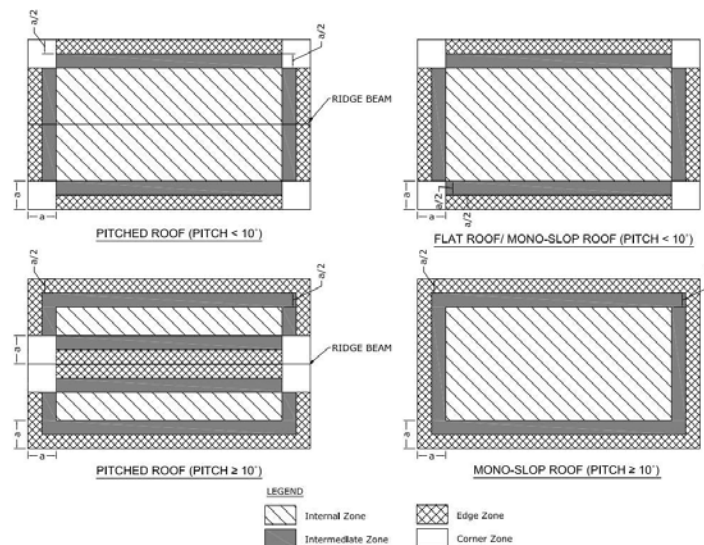


Figure2- Roof Zones Definition

In Figure 2, the value of dimension "a" is the minimum of $0.2b$ or $0.2d$, if (h/b) or $(h/d) \geq 0.2$; or $2h$ if both (h/b) and $(h/d) < 0.2$ (b & d are building dimensions and h is average roof height, see Figure 1)

Structural Design Documentation

Tilt Array Frame System Spacing Table

According to AS/NZS 1170.2-2021

with Titan Solar TTV2 Rail – STRAMIT Speed Deck Ultra 700 Roof
within Australia
Terrain Category 2 & 3

For: Jiangyin Titanergy Co. Ltd
No.11 Wuxiang Road
Yunting Street, Jiangyin
China 214422

Job Number: 11323-RM08d
Date: 30 June 2022



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Job No: 11323-RM08d
Client: Jiangyin Titanergy Co. Ltd
Project: Tilt Array Frame System Spacing Table
with Titan Solar TTV2 Rail – STRAMIT Speed Deck Ultra 700 Roof
Address: within Australia
Wind Terrain Category: Terrain Category 2 & 3

Australian/New Zealand 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 1170.2:2021	Structural design actions Part 2: Wind actions
AS/NZS 1664.1:1997 (R2020)	Aluminium structures Part 1: Limit state design
AS/NZS 4600:2018	Cold-formed steel structures
AS 4100:2020	Steel structures

Designed: BL
Checked: AA
Date: Jun-22

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Address: **within Australia**

Job: **11323-RM08d**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	1.8mx1.1m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height - h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal
A	630	965	1315	1555	630	965	1315	1555	540	830	1130	1470	485	740	1005	1405
B1	470	720	975	1520	470	720	975	1520	405	620	840	1300	--	555	750	1155
B2	--	585	790	1220	--	585	790	1220	--	505	680	1045	--	450	605	930
C	--	420	565	865	--	420	565	865	--	--	490	745	--	--	435	665
D	--	--	400	610	--	--	400	610	--	--	--	525	--	--	--	470

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	1.8mx1.1m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height - h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal
A	520	795	1080	1445	425	650	880	1340	--	585	795	1225	--	555	750	1155
B1	--	590	800	1235	--	485	660	1010	--	440	595	910	--	415	560	855
B2	--	480	650	1000	--	395	535	815	--	--	480	735	--	--	455	695
C	--	--	465	710	--	--	--	585	--	--	--	525	--	--	--	495
D	--	--	--	505	--	--	--	415	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2mx1.1m
3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height – h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	565	870	1185	1505	565	870	1185	1505	490	745	1015	1420	435	665	905	1360
B1	425	645	880	1365	425	645	880	1365	360	560	755	1170	--	500	675	1040
B2	--	525	710	1095	--	525	710	1095	--	455	610	940	--	405	545	840
C	--	375	505	775	--	375	505	775	--	--	440	670	--	--	390	600
D	--	--	355	550	--	--	355	550	--	--	--	475	--	--	--	420

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2mx1.1m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height – h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal	Corner	Edge	Intermed iate	Internal
A	465	715	975	1395	385	585	795	1230	--	525	715	1100	--	500	675	1040
B1	--	530	720	1115	--	440	590	910	--	395	535	820	--	375	505	770
B2	--	435	585	900	--	--	480	735	--	--	435	665	--	--	410	625
C	--	--	420	640	--	--	--	525	--	--	--	475	--	--	--	445
D	--	--	--	450	--	--	--	370	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
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Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2.2mx1.2m
3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Pitch angle to roof surface (α), $\alpha \leq 15^\circ$															
	Building Height - h (m)															
	h $\leq$ 5				5<h $\leq$ 10				10<h $\leq$ 15				15<h $\leq$ 20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	515	790	1075	1455	515	790	1075	1455	445	680	925	1375	395	605	825	1285
B1	--	590	800	1240	--	590	800	1240	--	505	685	1060	--	455	615	945
B2	--	475	645	995	--	475	645	995	--	410	555	855	--	--	495	765
C	--	--	460	705	--	--	460	705	--	--	395	610	--	--	--	545
D	--	--	--	500	--	--	--	500	--	--	--	430	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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Address: **within Australia**

Job: **11323-RM08d**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail
Type of Interface
Solar Panel Dimension
Terrain category

Titan Solar TTV2 Rail
Cliplok 700
2.2mx1.2m
2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

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Address: **within Australia**

Job: **11323-RM08d**
Date: **Jun-22**
Designed: **BL**
Checked: **AA**

Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.4mx1.2m
Terrain category	3

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

Wind Region	Building Height – h (m)															
	h≤5				5<h≤10				10<h≤15				15<h≤20			
	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal	Corner	Edge	Intermed late	Internal
A	470	725	985	1415	470	725	985	1415	405	620	845	1325	--	555	755	1175
B1	--	540	730	1140	--	540	730	1140	--	465	630	975	--	415	560	865
B2	--	435	590	915	--	435	590	915	--	--	510	785	--	--	455	700
C	--	--	420	645	--	--	420	645	--	--	--	560	--	--	--	500
D	--	--	--	455	--	--	--	455	--	--	--	390	--	--	--	--

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
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Checked: **AA**

Tilt Array Frame System Spacing Table for STRAMIT Speed Deck Ultra 700 Roof (mm)

Type of Rail	Titan Solar TTV2 Rail
Type of Interface	Cliplok 700
Solar Panel Dimension	2.4mx1.2m
Terrain category	2

Tilt angle to roof surface (α), $\alpha \leq 15^\circ$

[illegible]

Tilt angle to roof surface (α), $15^\circ < \alpha \leq 30^\circ$

[illegible]

Tilt angle to roof surface (α), $30^\circ < \alpha \leq 60^\circ$

[illegible]

Client: **Jiangyin Titanergy Co. Ltd**
Project: **Tilt Array Frame System Spacing Table**
with **Titan Solar TTV2 Rail – STRAMIT Speed Deck Ultra 700 Roof**
Address: **within Australia**

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Date: **Jun-22**
Designed: **BL**
Checked: **AA**

General Notes

Note 1 Following components are satisfied to use according to AS/NZS 1170.2:2021

Components	Part Number	Description
Rail	Titan Solar TTV2 Rail	As per drawing or test report provided by client
Mid Clamp	Mid Clamp Kit 40mm	
End Clamp	End Clamp Kit 40mm	
Roof Clamp	Titan Solar Cliplok 700	
Tilt Roof System	Titan Solar Tilt Roof System	

Note 2 Spacing calculated based on the roof clamp test results.

Note 3 Maximum uplift wind pressure is limited to 5kPa.

Note 4 Deflection is limited to Minimum of $L/120$ and 15mm.

Note 5 Tilt angle is measured from roof surface.

Note 6 "—" states NOT SUITABLE FOR INSTALLATION.

Note 7 Refer section 4.2.1 of AS/NZS 1170.2:2021 for terrain category definition.

Note 8 Wind regions are shown in Figure 3.1(A) of AS/NZS 1170.2:2021.

Note 9 Building height is average roof height of structure above ground. Refer Figure 1 for definition of h, d and b.

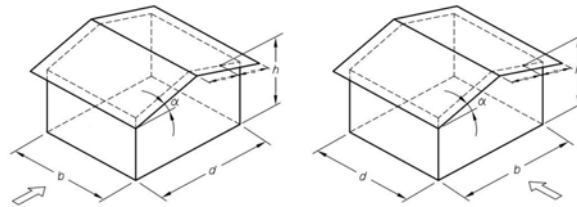
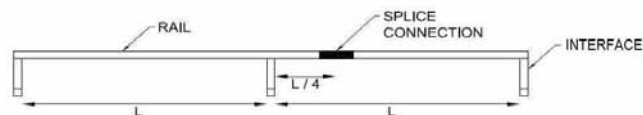


Figure 1 – h, d and b definition

Note 10 Rail splice connection must be placed a quarter length of the spacing of interface. No Splice connection should be placed at the centre of spacing or over the interface.



Note 11 Refer Figure 2 for definition of roof zones.

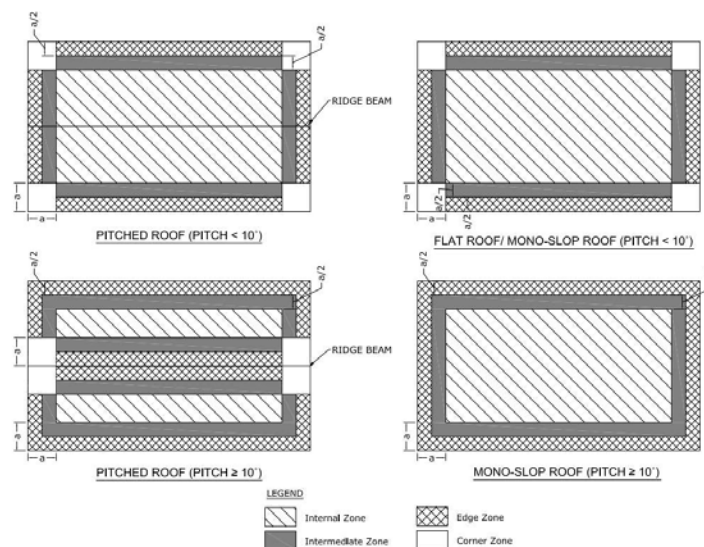


Figure2- Roof Zones Definition

In Figure 2, the value of dimension "a" is the minimum of $0.2b$ or $0.2d$, if (h/b) or $(h/d) \geq 0.2$; or $2h$ if both (h/b) and $(h/d) < 0.2$ (b & d are building dimensions and h is average roof height, see Figure 1)