Gamcorp (Melbourne) Pty Ltd A.C.N 141 076 904 A.B.N 73 015 060 240
www.gamcorp.com.au Email: melbourne@gamcorp.com.au
35 Butler St. Richmond VIC 3121. Tel: 03 9543 2211

Our Ref: 9981-02-Tilt/BL

4 July 2021

Tradezone Pty Ltd (Brand Name: Powerwave)
PO Box 3137, Helensvale
QLD 4212

PV Array Frame Engineering Certification

RE: Installation of Mibet Roof Tilt Mount Solar System on Tin Roof with MA Rails

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian Building Regulations, have carried out a structural design check of MA Rail Roof Tilt Mount Solar System installation on tin roof within Australia. The design check is based on the information and test reports provided by Tradezone Pty Ltd.

This certificate is **only valid** for the MA Rail Tilt Mount Solar System 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 MA Rail Roof Tilt Mount Solar System on tin roof for Australian use to be structurally sufficient based on the following conditions:

- Wind loads to AS/NZ1170.2:2011(R2016) Wind actions
- 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 **1670mm x 1000mm, 1970mm x 1000mm, 2100mm x 1050mm, 2200mm x 1200mm, 2400mm x 1200mm**
- Weight of the PV panel and array frame to be 15 kg/m^2
- Rails to be **MA Rails**
- Material to be **AL6005-T5** UNO
- The spacings are determined based on fixings into minimum JD4 seasoned timber and 1.9mm thick steel purlins
- Each PV panel to be installed using **2 rails** minimum in all circumstances
- 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)

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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 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 **Bianca Liu** in accordance with the provisions of Australian Building Regulations and in accordance with sound, widely accepted engineering principles. This certificate is only valid till 05/07/2023. 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: EC 45972
TAS Registration: CC7366

Attachments:

- Summary table for interface spacing – Tilt mount instillation on tin roof with MA rails

Gamcorp (Melbourne) Pty Ltd
Consulting Structural & Civil Engineers
A.C.N 141 076 904
A.B.N 73 015 060 240
www.gamcorp.com.au
melbourne@gamcorp.com.au

Structural Design Documentation

Mibet Tilt Array Frame System Spacing Table

According to AS/NZS 1170.2-2011 (R2016)

with MA Rail – Tin Roof

within Australia

Terrain Category 2 & 3

For: Tradezone Pty Ltd (Brand Name: Powerwave)
PO Box 3137, Helensvale
QLD 4212

Job Number: 9981-02-Tilt
Date: 29 June 2021

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35 Butler Street
Richmond VIC 3121
Tel: 03 9543 2211
melbourne@gamcorp.com.au
www.gamcorp.com.au
ISO 9001:2015 Registered Firm
Certificate No: AU1222

Job No: **9981-02-Tilt**
Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Mibet Tilt Array Frame System Spacing Table with MA Rail – Tin Roof**
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: **BL**
Checked: **AA**

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Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	1.67mx1m
Terrain category	**3**

Tilt angle to roof surface (α) – α ≤ 15°

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	825	1265	1480	1730	825	1265	1480	1730	625	1090	1400	1640	565	975	1320	1570
B	555	845	1145	1660	555	845	1145	1660	480	730	985	1525	--	655	880	1355
C	--	440	595	910	--	440	595	910	--	380	510	780	--	--	455	695
D	--	--	380	580	--	--	380	580	--	--	--	505	--	--	--	450

Tilt angle to roof surface (α) – 15° < α ≤ 25°

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	515	885	1200	1515	515	885	1200	1515	395	765	1035	1440	--	595	925	1380
B	--	595	805	1230	--	595	805	1230	--	515	695	1065	--	--	620	945
C	--	--	420	635	--	--	420	635	--	--	--	550	--	--	--	490
D	--	--	--	410	--	--	--	410	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 25° < α ≤ 30°

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	395	765	1040	1440	395	765	1040	1440	--	585	900	1370	--	525	805	1235
B	--	520	700	1070	--	520	700	1070	--	--	605	925	--	--	540	825
C	--	--	--	555	--	--	--	555	--	--	--	480	--	--	--	425
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	1.67mx1m
Terrain category	**2**

Tilt angle to roof surface (α) – $\alpha \leq 15°$

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	595	1040	1375	1610	505	855	1155	1495	395	765	1040	1440	295	655	985	1410
B	--	700	945	1455	--	575	775	1185	--	520	700	1070	--	490	660	1005
C	--	--	490	750	--	--	400	615	--	--	--	555	--	--	--	525
D	--	--	--	480	--	--	--	395	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – $15° < \alpha \leq 25°$

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	295	655	990	1415	--	535	810	1245	--	495	655	1120	--	410	605	1055
B	--	495	665	1015	--	--	545	830	--	--	495	750	--	--	465	705
C	--	--	--	525	--	--	--	430	--	--	--	390	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – $25° < \alpha \leq 30°$

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	860	1320	--	420	615	1080	--	--	565	970	--	--	535	920
B	--	--	580	885	--	--	475	725	--	--	--	655	--	--	--	615
C	--	--	--	460	--	--	--	375	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	1.97mx1m
Terrain category	**3**

Tilt angle to roof surface (α) – $\alpha \leq 15°$

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	615	1070	1400	1640	615	1070	1400	1640	535	925	1255	1550	495	825	1120	1485
B	470	715	970	1500	470	715	970	1500	405	620	835	1290	--	555	745	1150
C	--	375	500	770	--	375	500	770	--	220	435	660	--	--	385	590
D	--	--	230	495	--	--	230	495	--	--	--	425	--	--	--	380

Tilt angle to roof surface (α) – $15° < \alpha \leq 25°$

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	355	695	1015	1435	355	695	1015	1435	--	575	875	1355	--	515	785	1205
B	--	505	680	1045	--	505	680	1045	--	435	590	900	--	--	525	800
C	--	--	355	540	--	--	355	540	--	--	--	465	--	--	--	415
D	--	--	--	350	--	--	--	350	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – $25° < \alpha \leq 30°$

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	--	575	885	1365	--	575	885	1365	--	515	755	1170	--	395	595	1045
B	--	440	590	905	--	440	590	905	--	--	510	780	--	--	455	695
C	--	--	--	470	--	--	--	470	--	--	--	405	--	--	--	360
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	1.97mx1m
Terrain category	**2**

Tilt angle to roof surface (α) – α ≤ 15°

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	515	885	1200	1525	295	655	980	1415	--	575	880	1360	--	545	835	1285
B	--	590	800	1235	--	485	655	1005	--	440	595	905	--	415	560	855
C	--	--	415	635	--	--	340	520	--	--	--	470	--	--	--	445
D	--	--	--	405	--	--	--	335	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 15° < α ≤ 25°

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	--	555	840	1295	--	400	605	1055	--	--	555	945	--	--	525	895
B	--	420	565	860	--	--	465	705	--	--	420	635	--	--	375	600
C	--	--	--	445	--	--	--	365	--	--	--	330	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 25° < α ≤ 30°

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	655	1120	--	--	535	915	--	--	495	825	--	--	400	780
B	--	--	490	750	--	--	405	615	--	--	--	555	--	--	--	520
C	--	--	--	390	--	--	--	220	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	2.1mx1.05m
Terrain category	**3**

Tilt angle to roof surface (α) – $\alpha \leq 15°$

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	540	1005	1370	1610	540	1005	1370	1610	360	865	1180	1520	--	615	1050	1455
B	335	670	910	1410	335	670	910	1410	--	580	785	1210	--	520	700	1075
C	--	340	470	720	--	340	470	720	--	--	405	620	--	--	365	555
D	--	--	--	465	--	--	--	465	--	--	--	400	--	--	--	355

Tilt angle to roof surface (α) – $15° < \alpha \leq 25°$

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	955	1405	--	565	955	1405	--	455	665	1270	--	--	590	1130
B	--	470	640	980	--	470	640	980	--	250	550	845	--	--	495	755
C	--	--	--	505	--	--	--	505	--	--	--	435	--	--	--	390
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – $25° < \alpha \leq 30°$

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	--	485	675	1280	--	485	675	1280	--	--	580	1100	--	--	530	980
B	--	260	555	850	--	260	555	850	--	--	480	735	--	--	320	655
C	--	--	--	440	--	--	--	440	--	--	--	380	--	--	--	235
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	2.1mx1.05m
Terrain category	**2**

Tilt angle to roof surface (α) – $\alpha \leq 15°$

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal
A	--	670	1125	1490	--	550	920	1385	--	475	670	1275	--	415	625	1205
B	--	555	750	1155	--	390	615	945	--	260	555	850	--	--	525	800
C	--	--	390	595	--	--	--	485	--	--	--	440	--	--	--	415
D	--	--	--	380	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – $15° < \alpha \leq 25°$

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal
A	--	425	625	1215	--	--	530	990	--	--	425	890	--	--	--	705
B	--	205	530	805	--	--	325	660	--	--	205	595	--	--	--	560
C	--	--	--	420	--	--	--	265	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – $25° < \alpha \leq 30°$

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal	Corner	Edge	Interme diate	Internal
A	--	--	550	1050	--	--	--	755	--	--	--	615	--	--	--	585
B	--	--	435	700	--	--	--	575	--	--	--	520	--	--	--	490
C	--	--	--	365	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Relationships built on trust

Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	2.2mx1.2m
Terrain category	**3**

Tilt angle to roof surface (α) – α ≤ 15°

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	--	610	1310	1585	--	610	1310	1585	--	--	1125	1495	--	--	630	1430
B	--	485	725	1345	--	485	725	1345	--	--	630	1155	--	--	505	1025
C	--	--	260	690	--	--	260	690	--	--	--	595	--	--	--	525
D	--	--	--	440	--	--	--	440	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 15° < α ≤ 25°

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	--	--	595	1385	--	--	595	1385	--	--	--	1210	--	--	--	685
B	--	--	--	820	--	--	--	820	--	--	--	680	--	--	--	610
C	--	--	--	355	--	--	--	355	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 25° < α ≤ 30°

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	--	--	--	1220	--	--	--	1220	--	--	--	665	--	--	--	600
B	--	--	--	680	--	--	--	680	--	--	--	605	--	--	--	415
C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	2.2mx1.2m
Terrain category	**2**

Tilt angle to roof surface (α) – α ≤ 15°

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	--	--	**680**	**1470**	--	--	**525**	**1360**	--	--	--	**1220**	--	--	--	**1150**
B	--	--	**610**	**1105**	--	--	--	**750**	--	--	--	**680**	--	--	--	**645**
C	--	--	--	**565**	--	--	--	**305**	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 15° < α ≤ 25°

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	--	--	--	**1160**	--	--	--	**605**	--	--	--	**485**	--	--	--	--
B	--	--	--	**645**	--	--	--	**440**	--	--	--	--	--	--	--	--
C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 25° < α ≤ 30°

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	--	--	--	**630**	--	--	--	--	--	--	--	--	--	--	--	--
B	--	--	--	**515**	--	--	--	--	--	--	--	--	--	--	--	--
C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Relationships built on trust

Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	2.4mx1.2m
Terrain category	**3**

Tilt angle to roof surface (α) – α ≤ 15°

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	--	540	1200	1535	--	540	1200	1535	--	--	645	1455	--	--	595	1390
B	--	--	670	1235	--	--	670	1235	--	--	595	1060	--	--	375	940
C	--	--	--	630	--	--	--	630	--	--	--	545	--	--	--	360
D	--	--	--	290	--	--	--	290	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 15° < α ≤ 25°

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	--	--	460	1295	--	--	460	1295	--	--	--	1110	--	--	--	630
B	--	--	--	725	--	--	--	725	--	--	--	630	--	--	--	505
C	--	--	--	235	--	--	--	235	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 25° < α ≤ 30°

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	--	--	--	1115	--	--	--	1115	--	--	--	615	--	--	--	510
B	--	--	--	630	--	--	--	630	--	--	--	490	--	--	--	--
C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

Mibet Flush Array Frame System Spacing Table - mm

Type of Rail	MA Rail (Tin Roof)
Type of Interface	Tilt Roof Set
Solar Panel Dimension	2.4mx1.2m
Terrain category	**2**

Tilt angle to roof surface (α) – α ≤ 15°

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	--	--	620	1425	--	--	--	1245	--	--	--	1115	--	--	--	665
B	--	--	490	1010	--	--	--	690	--	--	--	630	--	--	--	605
C	--	--	--	520	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 15° < α ≤ 25°

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	--	--	--	675	--	--	--	510	--	--	--	--	--	--	--	--
B	--	--	--	605	--	--	--	--	--	--	--	--	--	--	--	--
C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tilt angle to roof surface (α) – 25° < α ≤ 30°

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	--	--	--	595	--	--	--	--	--	--	--	--	--	--	--	--
B	--	--	--	375	--	--	--	--	--	--	--	--	--	--	--	--
C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Relationships built on trust

Client: **Tradezone Pty Ltd (Brand Name: Powerwave)**
Project: **Solar Array Interface Spacing Table**
Address: **within Australia**
Designed: **BL**

Job: **9981-02-Tilt**
Date: **Jun-21**

Checked: **AA**

General Notes

Note 1 Following components are satisfied to use according to AS/NZS 1170.2-2011(R2016)

Components	Part Number	Description
MA Rail	MA Rail	as per drawing provided by client
Inter Clamp Kit (MA)	Inter Clamp Kit (MA)	as per drawing provided by client
End Clamp Kit (MA)	End Clamp Kit (MA)	as per drawing provided by client
Standard Tilt System	Standard Tilt System	as per drawing provided by client

Note 2 Spacing calculated based on 1.9mm steel purlin or 35mm screw embedment length into timber (JD4 seasoned timber).

Note 3 Recommended screws

Metal Purlins/Battens	Fasteners to use
1.9mm	M6-11 TPI RoofZips or 14g-10 TPI Teks screws
2.4mm above	14g-10 TPI Teks screws
Timber Purlins/Battens	**Fasteners to use**
Softwood/Hardwood (35mm embedment and above)	14g-10 TPI T17 screws

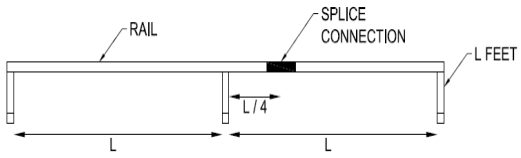
Note 4 Maximum uplift wind pressure is limited to 5 kPa. -- states more uplift pressure.

Note 5 Deflection is limited to Minimum of L/120 and 15mm

Note 6 Terrain Category 2 (TC2) refers to open terrain, including grassland, with well-scattered obstructions having heights generally from 1.5 m to 5 m, with no more than two obstructions per hectare, e.g. farmland and cleared subdivisions with isolated trees and uncut grass.
Terrain Category 3 (TC3) refers to terrain with numerous closely spaced obstructions having heights generally from 3 m to 10 m. The minimum density of obstructions shall be at least the equivalent of 10 house-size obstructions per hectare, e.g. suburban housing, light industrial estates or dense forests.

Note 7 Tile angle is measured from roof surface

Note 8 The optimised location of rail splice connection is at quarter length of the spacing of the interface. No Splice connection should be placed at the centre of spacing or over the interface.



Note 9 Refer Figure 2 for definition of roof zones.

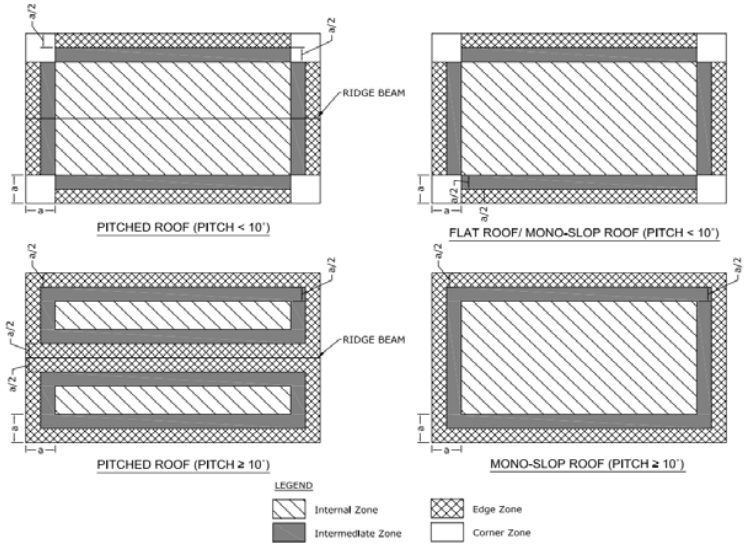


Figure 2 - Roof Zones Definition

In Figure 1, the value of dimension "a" is the minimum of 0.2b, 0.2d and h. (b & d are building dimensions and h is its height)