

Our Ref: 21170

January 2019

Fujian Antai New Energy Tech. Co., Ltd.

ANTAISOLAR Roof Mounting System for use within Australia - Type T Rail

Dome Consulting (Aust) Pty Ltd have carried out a structural design check of the Fujian Antai New Energy Tech. Co., Ltd. Adjustable Tilt Legs System for use in Australia. The design check has been based on the information provided by Mortec Industries

Australian Standards

AS 1170. 2011 – Structural Design Actions

Part 0 – General Principles

Part 1 – Permanent imposed and other actions

Part 2 – Wind Actions

Part 3 – Snow and Ice Actions

AS 1664.1 – Aluminium structures - Limit state design

Following design criteria has been used for the structural verification

Wind Region A, B, C, D

Wind Terrain Category 2 & 3

Wind average recurrence interval of 100 years

Maximum Building height 20 m

Max. Solar Panel Dimensions 2000×1000

The design and documentation has determined that all supporting componentry in the above mentioned documentation was found to be acceptable.

Refer to attached summary table for interface spacing.

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

Our Ref: 21170

January 2019

Fujian Antai New Energy Tech. Co., Ltd.

Structural Design Summary Table

Roof Mounting System with Type T Rail

For

Fujian Antai New Energy Tech. Co., Ltd.
in accordance to AS1170.2 2011 Amdt 5 - June 2017

Terrain Category 3

Tile Roof 5° < a < 10° TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1817	1638	1637	1323		1188	829	732	518
15 m	1735	1570	1567	1124		1013	709	631	449
20 m	1676	1432	1435	992		896	631	559	400

Tile Roof 10° < a < 20° TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1688	1446	1479	1000		922	636	576	402
15 m	1617	1226	1256	857		788	546	495	347
20 m	1564	1082	1106	760		701	487	440	310

Tile Roof 20° < a < 30° TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1638	1555	1323	1089		829	689	518	434
15 m	1570	1338	1124	930		709	593	449	376
20 m	1432	1179	992	824		631	528	400	336

Tile Roof 30° < a < 60° TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1649	1505	1561	1177		1171	838	819	530
15 m	1611	1355	1446	1053		1045	724	706	457
20 m	1582	1244	1332	962		955	642	628	405

Tin Roof $5^\circ < a < 10^\circ$ TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1817	1638	1637	1488		1442	1316	1271	1164
15 m	1735	1570	1567	1429		1387	1267	1222	1123
20 m	1676	1520	1517	1385		1343	1232	1187	1091

Tin Roof $10^\circ < a < 20^\circ$ TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1688	1523	1529	1388		1354	1235	1196	1094
15 m	1617	1461	1467	1335		1302	1188	1152	1054
20 m	1564	1417	1423	1294		1264	1153	1117	1025

Tin Roof $20^\circ < a < 30^\circ$ TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1638	1555	1488	1417		1316	1258	1164	1115
15 m	1570	1494	1429	1361		1267	1211	1123	1074
20 m	1520	1446	1385	1320		1232	1176	1091	1045

Tin Roof $30^\circ < a < 60^\circ$ TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1649	1538	1561	1444		1436	1322	1309	1170
15 m	1588	1496	1520	1402		1395	1276	1259	1129
20 m	1582	1467	1490	1373		1366	1238	1222	1097

Notes

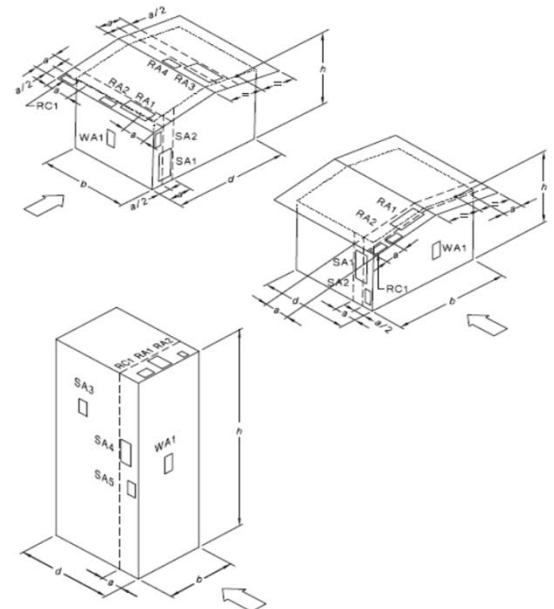
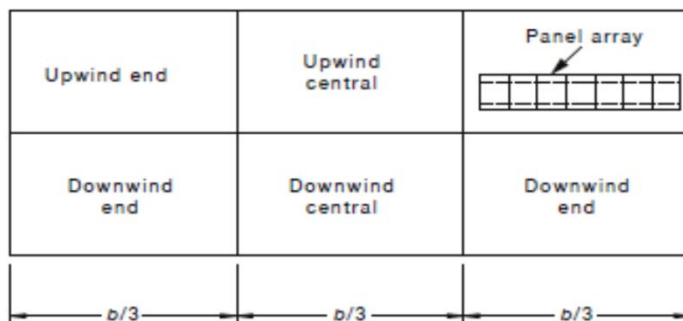
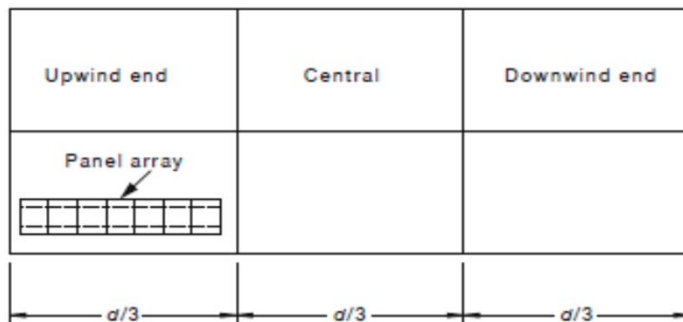
- * Minimum 35mm embedment length into timber
- * Please note that the screws provided with our products are designed for mounting in to wooden and metal structures. ANTAI Solar recommend using 13-11x50 RoofStars - Self Drilling Screws from ICONS® to fix to steel purlins.
- * Above spacing based on 1.9mm steel purlin or F17 Hardwood - Following reductions shall be applied

Material	Wind region C		Wind region C	
	Centre	Edge	Centre	Edge
0.55mm steel batten	22%	25%	30%	42%
0.75mm steel batten	n/a	n/a	10%	5%

- * Please consult ANTAI Solar for installing PV modules with a greater length than 2000mm.
- * For PV panels with length of 1700mm, increase the spacing by 15%.

Terrain Category 2 (TC2) 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) 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.



- NOTES:
- 1 The value of dimension a is the minimum of $0.2b$, $0.2d$ and h .
 - 2 The side ratio of any local pressure factor area on the roof shall not exceed 4.

Our Ref: 21170

January 2019

Fujian Antai New Energy Tech. Co., Ltd.

Structural Design Summary Table

Roof Mounting System with Type T Rail

For

Fujian Antai New Energy Tech. Co., Ltd.
in accordance to AS1170.2 2011 Amdt 5 - June 2017

Terrain Category 2

Tile Roof 5° < a < 10° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1611	1238	1241	866		779	552	489	350
15 m	1564	1108	1109	775		701	496	443	316
20 m	1502	1038	1039	731		660	467	417	298

Tile Roof 10° < a < 20° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1385	941	962	663		613	426	388	272
15 m	1235	844	863	596		552	385	350	246
20 m	1158	794	810	560		520	362	330	232

Tile Roof 20° < a < 30° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1238	1023	866	719		552	461	350	295
15 m	1108	917	775	645		496	417	316	266
20 m	1038	861	731	607		467	391	298	252

Tile Roof 30° < a < 60° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1541	1126	1209	866		861	563	550	356
15 m	1435	1041	1118	792		788	508	495	321
20 m	1373	994	1068	745		739	479	466	304

Tin Roof 5° < a < 10° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1611	1464	1464	1338		1299	1191	1149	1057
15 m	1564	1423	1423	1300		1264	1159	1120	1031
20 m	1538	1402	1400	1282		1243	1141	1103	1013

Tin Roof 10° < a < 20° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1505	1367	1373	1250		1220	1115	1083	993
15 m	1464	1332	1335	1218		1191	1089	1057	967
20 m	1441	1311	1314	1200		1171	1071	1039	952

Tin Roof 20° < a < 30° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1464	1397	1338	1276		1191	1138	1057	1010
15 m	1423	1358	1300	1244		1159	1109	1031	984
20 m	1402	1338	1282	1223		1141	1092	1013	973

Tin Roof 30° < a < 60° TG.2 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails)									
Max. Support Spacing (mm)									
Installation Height (m)	Region A		Region B			Region C		Region D	
	Center	Edge	Center	Edge		Center	Edge	Center	Edge
10 m	1546	1432	1452	1338		1331	1197	1181	1060
15 m	1520	1402	1426	1309		1302	1165	1152	1034
20 m	1502	1385	1408	1288		1281	1147	1135	1019

Notes

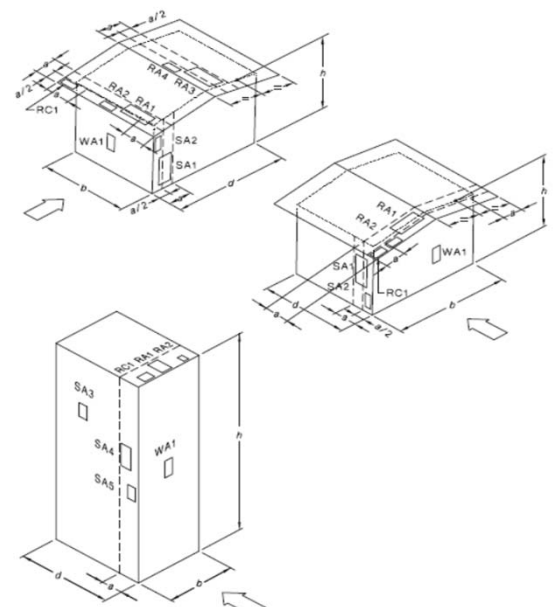
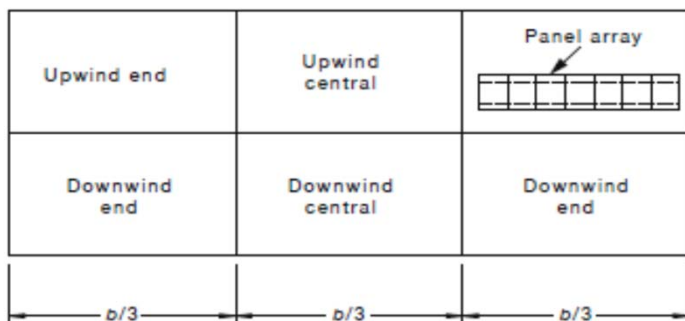
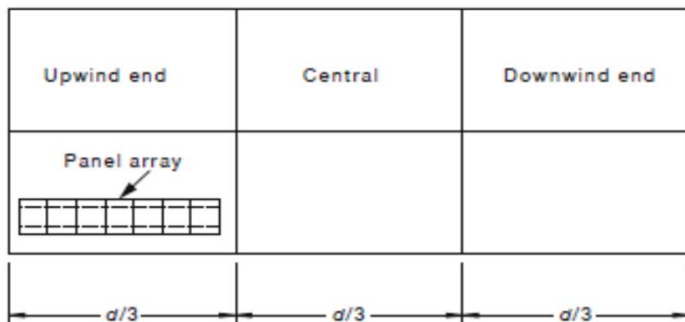
- * Minimum 35mm embedment length into timber
- * Please note that the screws provided with our products are designed for mounting in to wooden and metal structures. ANTAI Solar recommend using 13-11x50 RoofStars - Self Drilling Screws from ICONS® to fix to steel purlins.
- * Above spacing based on 1.9mm steel purlin or F17 Hardwood - Following reductions shall be applied

Material	Wind region C		Wind region C	
	Centre	Edge	Centre	Edge
0.55mm steel batten	22%	25%	30%	42%
0.75mm steel batten	n/a	n/a	10%	5%

- * Please consult ANTAI Solar for installing PV modules with a greater length than 2000mm.
- * For PV panels with length of 1700mm, increase the spacing by 15%.

Terrain Category 2 (TC2) 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) 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.



- NOTES:
- 1 The value of dimension a is the minimum of $0.2b$, $0.2d$ and h .
 - 2 The side ratio of any local pressure factor area on the roof shall not exceed 4.