Elite Compliance

13th January 2020

Chief Executive Officer
Planning Approval Department
Shire of York
1 Joaquina Street
York WA 6302

Attention: Planning Department – Application for Planning Approval

Dear Sir/ Madam,

Herewith application for Planning Approval for the installation of solar panels on the existing commercial building located on Lot 5 (No 138) Avon Terrace, York.

Please find enclosed;

- 1 x Copy of design package
- 1 x Planning Application form

We ask that you please contact the undersigned on (08) 9443 2102 for payment of all applicable fees via credit card and send the receipt to accounts@elitecomp.com.au

We look forward to the City's timely issue of the Planning Permit and working with the City as the project moves forward.

Should you have any queries regarding the application, please feel free to contact me directly.

Kind Regards,

Kasey Venter

Managing Director

ELITE COMPLIANCE PTY LTD – BSC 2031

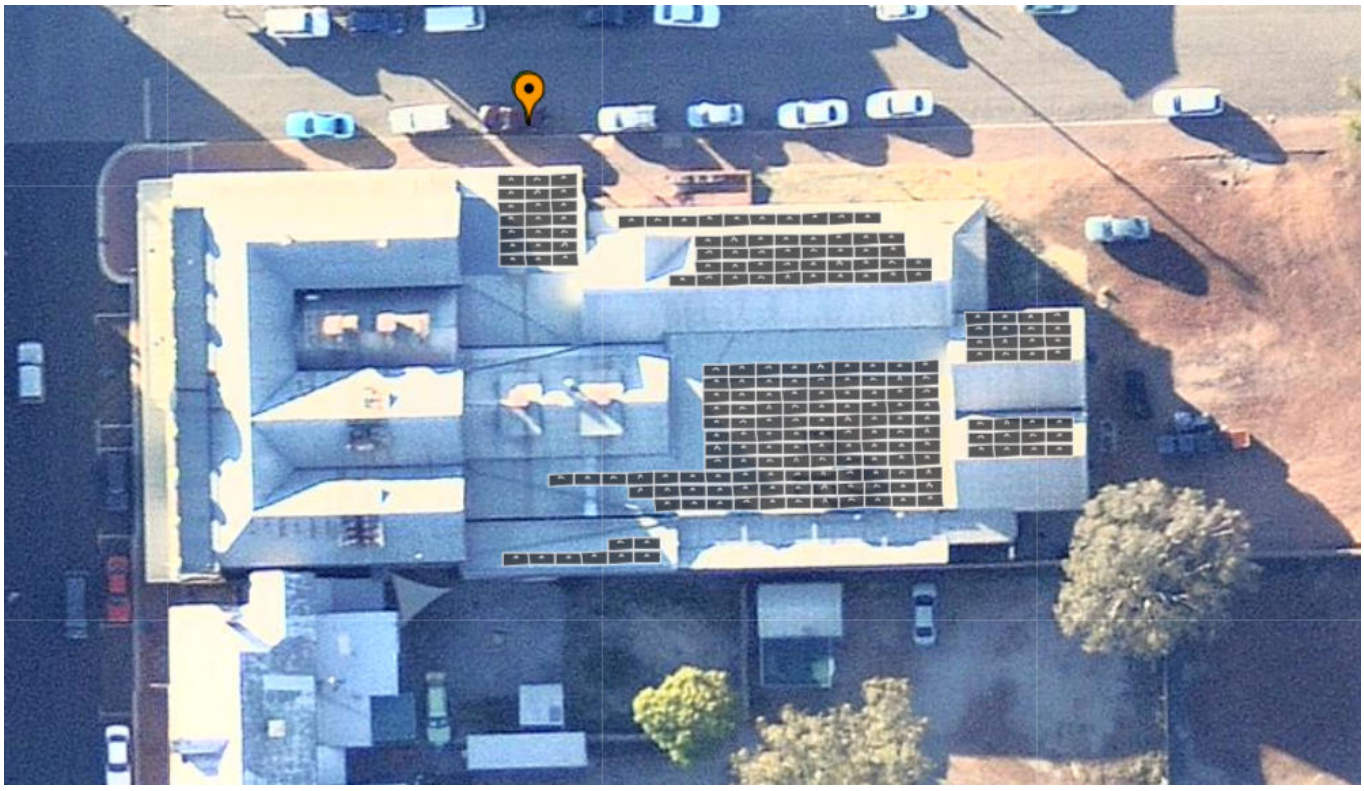
SOLAR SUITE

SITE PLAN

York & District Co-Operative Ltd
138 Avon Terrace, York, WA 6302

Proposed Solar PV Size: 81.62kW
Panel Quantity and Model: 212 x JAM72S09-385/PR/1000V

Height of the roof from ground: 3 meters to 10 meters
Roof Pitch: 3 degrees to 35 degrees
Panel Orientation: All panels are flush mounted



HERITAGE IMPACT STATEMENT

A GUIDE

INTRODUCTION

This guide explains what a heritage impact statement is, when one is needed, and the level of detail that is required.

This guide has been prepared to:

(a) assist people who wish to carry out development that could impact on a heritage place or area

(b) assist local governments in considering whether to approve such development.

Local governments may adapt the document to suit their own circumstances.

What is a heritage impact statement?

A heritage impact statement (HIS) describes and evaluates the likely impact of a proposal.

An HIS is a clear and concise account of the proposed work that addresses three basic questions:

- How will the proposed works affect the significance of the place or area?
- What measures (if any) are proposed to ameliorate any adverse impacts?
- Will the proposal result in any heritage conservation benefits that might offset any adverse impacts?

When is a heritage impact statement needed?

Many local governments encourage proponents to submit an HIS with any development proposal affecting a heritage place.

Whether or not a local government may require an HIS, and the amount of detail expected, will depend on:

(a) the significance of the place; and

(b) the likely impact of the proposal on that significance.

For instance, a proposal to partially demolish, or construct an addition to a place that is listed in the highest category in the local Heritage List, will typically require a detailed HIS.

Minor works to a place of lesser significance may not require an HIS at all.

How is the significance of a place or area determined?

An HIS will always be based on a Statement of Significance for the place, which clearly spells out the identified heritage values.

Typically, this will be drawn from a State Register entry, a Local Government inventory entry, or a Conservation Management Plan or Strategy (CMP or CMS). If none of these sources exist, it may be necessary for a significance statement to be prepared.

It may also be necessary if an existing statement is very brief and gives little useful guidance about the significance of the place and its fabric.

If a CMP and CMS exists, direct reference should be made to the conservation policies.

How should a heritage impact statement be presented?

An HIS should be concise.

It should contain a conclusion that addresses the three key questions outlined under 'What is a heritage impact statement?'.

In preparing the HIS, it may be useful to address some more detailed questions, such as those outlined in the table at Appendix 1. If the Local Government or heritage agency dealing with the proposal has decision guidelines or planning policy in relation to the place or area, these should be specifically addressed.

Relevant supporting documentation, where it exists (e.g. a statement of significance, conservation plan or conservation policy, physical condition report or any other consultant's report), should be referred to in the statement and relevant extracts attached. These documents should not simply be repeated verbatim within the HIS.

QUESTIONS TO BE ANSWERED IN A HERITAGE IMPACT STATEMENT

APPENDIX ONE

PROPOSED CHANGE TO HERITAGE PLACE	SOME QUESTIONS TO BE ANSWERED IN A STATEMENT OF HERITAGE IMPACT
Demolition of a building or structure NB. Check State Planning Policy 3.5 - Historic heritage conservation	• Have all options for retention and adaptive re-use been explored? • Is demolition essential at this time, or can it be postponed in case future circumstances make retention and conservation more feasible? • Can any new development can be located elsewhere on the site, so the significant elements of the place can be retained? • Has the advice of a heritage consultant been taken? If not, why not?
Minor partial demolition (including internal elements)	• Is the demolition essential for the heritage place to function? • Are important features of the place affected by the demolition (e.g. fireplaces or staircases)? • Is the partial demolition sympathetic to the heritage significance of the place? • If the partial demolition is proposed because of the condition of the fabric, is it certain that the fabric cannot be repaired?
Change of use	• Has the advice of a heritage consultant been implemented? If not, why not? • Does the existing use contribute to the significance of the heritage place? • Why does the use need to be changed? • What changes to the fabric are required as a result of the change of use? • What changes to the site are required as a result of the change of use? • Has the advice of a heritage consultant been taken? If not, why not?
Minor additions (see also minor partial demolition)	• How is the impact of the addition on the heritage significance of the place to be minimised? • Can the additional space be located within an existing structure? If not, why not? • Will the additions visually dominate the heritage place? • Are the additions sympathetic to the heritage place? In what way (e.g. form, proportions, design, materials)?
New development adjacent to a heritage place (additional buildings and major additions)	• How is the impact of the new development on the heritage significance of the place or area to be minimised? • Why is the new development required to be adjacent to a heritage place? • How does the new development affect views to, and from, the heritage place? What has been done to minimise negative effects? • Is the new development sympathetic to the heritage place? In what way (e.g. form, siting, proportions, design, materials)? • Will the new building(s) visually dominate the heritage place? How has this been minimised? • Will the public and users of the place, still be able to view and appreciate its significance?
Subdivision	• Could future development resulting from this subdivision compromise the significance of the heritage place (e.g. by requiring demolition of part of a heritage building, or by siting new buildings too close to a heritage building)? • How are negative impacts to be minimised? • Could future development that results from this subdivision affect views to, and from, the heritage place? How are negative impacts to be minimised?
Repainting (Using new colour schemes)	• Have previous (including original) colour schemes been investigated? Are previous schemes being reinstated? • Will the repainting affect the conservation of the fabric of the heritage place?

PROPOSED CHANGE TO HERITAGE PLACE	SOME QUESTIONS TO BE ANSWERED IN A STATEMENT OF HERITAGE IMPACT
Re-roofing/re-cladding	• Have previous (including original) roofing/cladding materials been investigated (through archival and physical research)? • Is a previous material being reinstated? • Will the re-cladding effect the conservation of the fabric of the heritage place? • Are all details in keeping with the heritage significance of the place (e.g. guttering, cladding profiles)? • Has the advice of a heritage consultant or skilled tradesperson (e.g.roof slater) been taken?
New services (e.g. air conditioning, plumbing)	• How has the impact of the new services on the heritage significance of the place been minimised? • Are any of the existing services of heritage significance? In what way? Are they affected by the new work? • Has the advice of a heritage consultant (e.g. architect) been taken?
Fire services upgrades	• How has the impact of the fire upgrading on the heritage significance been minimised? • Are any of the existing services of heritage significance? In what way? Are they affected by the new work? • Has the advice of a conservation consultant (e.g. architect) been taken (and if so how)? • Has the advice of a fire consultant been taken as to options that would have less impact on the heritage place (and if so how)?
New landscape works and features (including carparking and fences)	• How has the impact of the new work on the heritage significance of the existing landscape been minimised? • Has evidence (archival and physical) of previous landscape work been investigated/ Are previous works being reinstated? • Has the advice of a consultant skilled in the conservation of heritage landscapes been sought? If so, have their recommendations been implemented? • Are any known or potential archaeological deposits affected by the landscape works? If so, what alternatives have been considered? • How does the work impact on views to, and from, adjacent heritage items?
Tree removal or replacement NB: Always check the tree preservation provisions of your local government when proposing the removal of trees	• Does the tree contribute to the heritage significance of the place? • Why is the tree being removed? • Has the advice of a tree surgeon or horticultural specialist been taken (and if so how)? • Is the tree being replaced and with what species? Why?
New Signage NB: Check whether the local government has a signage policy or design guidelines	• How has the impact of the new signage on the heritage significance of the place been minimised? • Have alternative signage forms been considered (and if not why not)? • Will the signage visually dominate the heritage place or heritage area? • Can the sign be remotely illuminated rather than internally illuminated?

Contact us

Heritage Council of WA
140 William Street, Perth
Locked Bag 2506
Perth WA 6001

T: (08) 6551 8002
FREECALL (regional): 1800 524 000
E: info@dplh.wa.gov.au
W: www.dplh.wa.gov.au

HERITAGE IMPACT STATEMENT

FORM

Name of Place: York Co - OP (York IGA)

Date: 14/01/2020

Prepared by: Solar Suite Pty Ltd

Prepared for: Installation of Solar Panels on the existing building

The Place/Area: Roof

Prepared for: Energy Efficiency

Date: 14/01/2020

Heritage listings:

York CO - OP Building (138 Avon Terrace York)

Statement of significance:

We believe the solar installation will not adversely affect the heritage significance.

The following aspects of the proposal respect or enhance the heritage significance of the place or area, for the following reasons:

The solar is being installed only on the renovated part of the roof. No existing heritage roofing is being impacted at all. They will follow the contours of the roof so will not adversely affect the aesthetics of the building. No solar will be visible from Avon Terrace.

The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:

We can see no way that the solar installation could detrimentally impact the heritage significance of the building, and as mentioned the solar panels will be following the contours of the existing roof, running parallel approximately 100mm above existing roof

Conclusion:

As we are using only the renovated part of the building, I believe solar panels will have no effect on the heritage significance of the building while reducing the town's carbon footprint.

References and attachments:

Contact us

Heritage Council of WA
Locked Bag 2506
Perth WA 6001

T: (08) 6551 8002
FREECALL (regional): 1800 524 000
E: info@dplh.wa.gov.au
W: www.dplh.wa.gov.au

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Proud Member of: CONSULT AUSTRALIA Representing Engineering Excellence

Our Ref: 4769 Rev.1/KZ

31 July 2018

PV Array Frame Engineering Certification

Installation of Xiamen Antai New Energy Roof Flush Mount Solar Racking System

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian Building Regulations, have carried out a structural engineering assessment of Antai New Energy Roof Flush Mount Solar Racking System installation within Australia. The assessment has been based on the information and the schematic drawings of the system components provided by Xiamen Antai New Energy Tech Co. Ltd.

This certificate is **only valid** for the Antai Solar Roof 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 JD4 seasoned timber and 1.9BMT steel. If the fixing condition is different from this condition, 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 Xiamen Antai New Energy Roof Flush Mount Solar Racking System to be structurally adequate and compliant with AS/NZS 1170.2:2011 (R2016) for the proposed solar array installation, provided the conditions listed within this certificate are adhered to:

- Loading to:
  - AS/NZS1170.0:2002 – Structural design actions, Part 0: General principles;
  - AS/NZS1170.1:2002 – Structural design actions, Part 1: Permanent, imposed and other actions;
  - AS/NZS1170.2:2011 (R2016) – Structural design actions, Part 2: Wind actions;
- Wind region **A, B, C, D**
- Wind terrain category **2 & 3**
- Wind average recurrence interval of **200 years**
- Maximum building height **20m**
- Maximum PV panel dimensions to be **2000mm x 1000mm**
- Maximum weight of the PV panel and array frame to be 15 kg/m^2
- Relevant certified system components are listed in the "**General Note**" page
- Each PV Panel to be installed using **4 rails minimum** for wind region **D**, wind terrain category **2**
- Each PV Panel to be installed using **3 rails minimum** for wind region **D**, wind terrain

category **3**
- Each PV Panel to be installed using **3 rails minimum** for wind region **C**, wind terrain category **2**
- Each PV Panel to be installed using **2 rails minimum** for wind region **C**, wind terrain category **3**
- Each PV Panel to be installed using **2 rails minimum** for wind region **A & B**, wind terrain category **2&3**
- Installation of PV array to be done in accordance with the PV installation manual
- The certification **excludes** assessment of building structure and PV panels
- Regional Ultimate Design Wind Speed:

Wind Region	A	B	C	D
Wind Speed (m/s)	43	52	64	79.2

Refer to attached summary table for interface spacing

NOTES:
- **The assessment is based on the capacity of the solar racking system and fixing under certain conditions, not building structure or PV panel. It is the responsibility of the installer to adopt the most critical spacing.**
- **For rails fixed using penetrative screw fixings;**
  - **Screw fixings to be 14g self drilling screws compliant with AS3566.**
  - **Screws must fully penetrate underlying purlin flange or penetrate to minimum depth specified in conditions, and installer must ensure that manufacturers specifications are followed.**
- **If any of the above conditions cannot be met, the structural engineer must be notified immediately.**

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Construction is to be carried out strictly in accordance with the instruction manual. This work was designed by **Kevin Zhang** in accordance with the provisions of Australian Building Regulations and in accordance with sound, widely accepted engineering principles. This certification is only valid till 31/07/2020 and shall seek Gamcorp for re-validation after this date.

Yours faithfully,
Gamcorp (Melbourne) Pty Ltd

Jianzeng Geng
Principal Engineer
MIEAust CPEng NER 3108316
NT Registration: 239858ES
QLD Registration: 18455
VIC Registration: EC 39483
TAS Registration: CC7263

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Structural Design Documentation

Tin Roof Flush Mount Solar System
Interface Spacing Table
According to AS/NZS 1170.2-2011 (R2016)
with ATL-TYN-28 Rails
within Australia

Terrain Category 2 & 3

For: Xiamen Antai New Energy Technology Co. Ltd.

Proud Member of: CONSULT AUSTRALIA Representing Engineering Excellence

Job Number: 4769
Date: 17 May 2018

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Job No: **4769**

Client: **Xiamen Antai New Energy Technology Co. Ltd.**

Project: **Tin Roof Flush Mount Interface Spacing Table**

Address: **within Australia**

Australian Standards

AS/NZS 1170 – Structural Design Actions
Part 0 -2002 – General Principles
Part 1 -2002 – Permanent imposed and other actions
Part 2 -2011(R2016) – Wind Actions
AS 4055 -2012 – Wind Loads for Housing
AS/NZS 1664 -1997 – Aluminium Structures
AS 4100 -1998(R2016) – Steel Structures
AS/NZS 4600 -2005 – Cold-Formed Steel Structures

Wind Terrain Category: WTC 2 & 3

Designed: **K.Z**

Date: **May-18**

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Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Flush Mount Interface Spacing Table

Type of Rail	ATL-TYN-28
Type of Interface	ATL-FWNY-05
Solar Panel Dimension	2.0m x 1.0m
Terrain category	**3**

Roof Angle (Φ) – $0° \leqslant \Phi < 5°$

Wind Region	Building Height – H (m)							
	H≤10			10<H≤15			15<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1976**	**2172**		**1693**	**2056**		**1502**	**1859**
B	**1303**	**1609**		**1122**	**1382**		**999**	**1229**
C	**837**	**1027**		**723**	**886**		**646**	**790**
D	**538**	**658**		**466**	**570**		**417**	**509**

Roof Angle (Φ) – $5° \leqslant \Phi \leqslant 30°$

Wind Region	Building Height – H (m)							
	H≤10			10<H≤15			15<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1976**	**2314**		**1693**	**2185**		**1502**	**2092**
B	**1303**	**1907**		**1122**	**1635**		**999**	**1451**
C	**837**	**1211**		**723**	**1043**		**646**	**929**
D	**538**	**773**		**466**	**668**		**417**	**597**

D.W & U.W – Downwind and Upwind refer to note 3.

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Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Roof Angle (Φ) – 30°< Φ ⩽ 60°

Wind Region	Building Height – H (m)								
		H≤10			10<H≤15			15<H≤20	
		Intermediate	**Internal**		**Intermediate**	**Internal**		**Intermediate**	**Internal**
A		**2227**	**2461**		**2146**	**2381**		**2084**	**2317**
B		**2145**	**2401**		**1836**	**2320**		**1627**	**2256**
C		**1356**	**2118**		**1167**	**1813**		**1039**	**1607**
D		**863**	**1328**		**746**	**1143**		**665**	**1018**

Intermediate and Internal roof zone refer to note 3.

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Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Flush Mount Interface Spacing Table

Type of Rail	ATL-TYN-28
Type of Interface	ATL-FWNY-05
Solar Panel Dimension	2.0m x 1.0m
Terrain category	**2**

Roof Angle (Φ) – $0° \leqslant \Phi < 5°$

Wind Region	Building Height – H (m)							
	H≤5			5<H≤10			10<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1612**	**1998**		**1314**	**1622**		**1114**	**1372**
B	**1070**	**1317**		**877**	**1077**		**746**	**915**
C	**691**	**846**		**568**	**695**		**485**	**592**
D	**445**	**544**		**367**	**448**		**314**	**383**

Roof Angle (Φ) – $5° \leqslant \Phi \leqslant 30°$

Wind Region	Building Height – H (m)							
	H≤5			5<H≤10			10<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1612**	**2147**		**1314**	**1923**		**1114**	**1622**
B	**1070**	**1557**		**877**	**1269**		**746**	**1077**
C	**691**	**995**		**568**	**816**		**485**	**695**
D	**445**	**638**		**367**	**525**		**314**	**448**

D.W & U.W – Downwind and Upwind refer to note 3.

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Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Roof Angle (Φ) – 30°< Φ ⩽ 60°

Wind Region	Building Height – H (m)								
	H≤5			5<H≤10			10<H≤20		
	Intermediate	**Internal**		**Intermediate**	**Internal**		**Intermediate**	**Internal**	
A	**2121**	**2355**		**2014**	**2246**		**1822**	**2157**	
B	**1748**	**2294**		**1422**	**2185**		**1205**	**1874**	
C	**1113**	**1726**		**911**	**1405**		**776**	**1190**	
D	**712**	**1091**		**585**	**893**		**499**	**760**	

Intermediate and Internal roof zone refer to note 3.

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Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **Jul-18**
Checked: **J.G**

General Notes

Note 1

Following components are satisfied to use according to AS/NZS 1170.2-2011

Components	**Part Number**	**Description**
Standard Rail	ATL-TYN-28	as per test report MT-18/022 by Melbourne Testing Services
Rail Splice	ATL-TYN-21	as per test report MT-18/022 by Melbourne Testing Services
Tile Hook Bracket	AU001	as per test report MT-14/473 by Melbourne Testing Services
L-foot Bracket	ATL-TWNY-05	as per test report MT-18/377 by Melbourne Testing Services
Inner Panel Clamp	ATL-FWNY-09	internal fixing between rail and PV panel
End Panel Clamp	ATL-TYN-14	end fixing between rail and PV panel
Inner Panel Clamp 2	ATL-GN-003	internal fixing between rail and PV panel

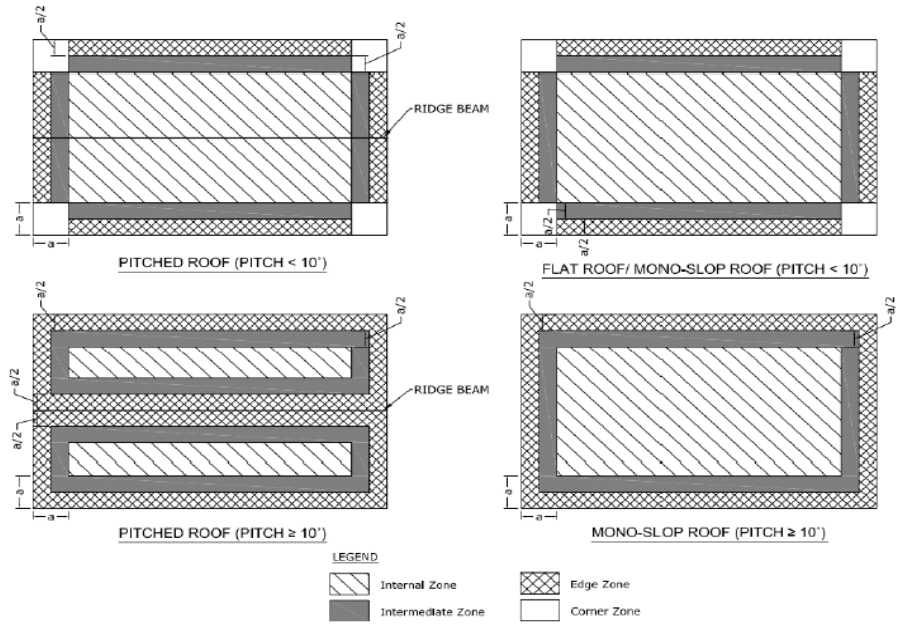
Note 2

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 obstruction per obstructions per hectare.

Terrain category 3(TC3) refers to numerous closely spaced obstructions having heights generally from 3 m to 10 m. For example suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011(R2016) for definition of Terrain category 3.

Note 3

For the definition of Downwind, Upwind end and central, refer figure D9 from AS/NZS 1170.2-2011.
For the definition of Intermediate and Internal roof zone, refer the following figure.
Corner and Edge zone are recommended exclusion zone.



Note 4

Screw embedment is minimum 35 mm into timber.

Note 5

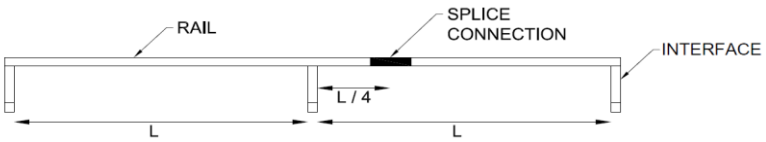
Recommended Screws

Metal Purlin/Batten	**Fasteners to Use**
Non-cyclonic Region	Buildex 14g-10 TPI Teks screws
Cyclonic Region	Buildex M6 RoofZips screws
Timber Rafter & Purlin/Batten	**Fasteners to Use**
Softwood and Hardwood (35mm embedment depth or more)	Buildex 14g-10 TPI (T17s) screws

Note: The spacing tables are applicable to minimum 1.9mm BMT steel purlin and JD4 seasoned timber.

Note 6

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 7

Recommended number of panel clamps required per panel

Wind Region	TC2	TC3
A	4	4
B	4	4
C	6	4
D	8	6

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Structural Design Documentation

Tin Roof Flush Mount Solar System
Interface Spacing Table
According to AS/NZS 1170.2-2011 (R2016)
with ATL-TYN-53 Rails
within Australia

Terrain Category 2 & 3

For:

Proud Member of: CONSULT AUSTRALIA Representing Engineering Excellence

Job Number: 4769
Date: 18 May 2018

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Job No: **4769**

Client:

Project: **Tin Roof Flush Mount Interface Spacing Table**

Address: **within Australia**

Australian Standards

AS/NZS 1170 – Structural Design Actions
Part 0 -2002 – General Principles
Part 1 -2002 – Permanent imposed and other actions
Part 2 -2011(R2016) – Wind Actions
AS 4055 -2012 – Wind Loads for Housing
AS/NZS 1664 -1997 – Aluminium Structures
AS 4100 -1998(R2016) – Steel Structures
AS/NZS 4600 -2005 – Cold-Formed Steel Structures

Wind Terrain Category: WTC 2 & 3

Designed: **K.Z**

Date: **May-18**

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Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Flush Mount Interface Spacing Table

Type of Rail	ATL-TYN-53
Type of Interface	ATL-FWNY-05
Solar Panel Dimension	2.0m x 1.0m
Terrain category	**3**

Roof Angle (Φ) – $0° \leqslant \Phi < 5°$

Wind Region	Building Height – H (m)							
	H≤10			10<H≤15			15<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1957**	**2113**		**1693**	**1999**		**1502**	**1859**
B	**1303**	**1609**		**1122**	**1382**		**999**	**1229**
C	**837**	**1027**		**723**	**886**		**646**	**790**
D	**538**	**658**		**466**	**570**		**417**	**509**

Roof Angle (Φ) – $5° \leqslant \Phi \leqslant 30°$

Wind Region	Building Height – H (m)							
	H≤10			10<H≤15			15<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1957**	**2250**		**1693**	**2125**		**1502**	**2034**
B	**1303**	**1907**		**1122**	**1635**		**999**	**1451**
C	**837**	**1211**		**723**	**1043**		**646**	**929**
D	**538**	**773**		**466**	**668**		**417**	**597**

D.W & U.W – Downwind and Upwind refer to note 3.

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Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
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Job: **4769**
Date: **May-18**
Checked: **J.G**

Roof Angle (Φ) – 30°< Φ ⩽ 60°

Wind Region		Building Height – H (m)							
		H≤10			10<H≤15			15<H≤20	
		Intermediate	**Internal**		**Intermediate**	**Internal**		**Intermediate**	**Internal**
A		**2165**	**2393**		**2087**	**2315**		**2026**	**2253**
B		**2106**	**2334**		**1836**	**2256**		**1627**	**2194**
C		**1356**	**2118**		**1167**	**1813**		**1039**	**1607**
D		**863**	**1328**		**746**	**1143**		**665**	**1018**

Intermediate and Internal roof zone refer to note 3.

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Relationships built on trust

Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Flush Mount Interface Spacing Table

Type of Rail	ATL-TYN-53
Type of Interface	ATL-FWNY-05
Solar Panel Dimension	2.0m x 1.0m
Terrain category	**2**

Roof Angle (Φ) – $0° \leqslant \Phi < 5°$

Wind Region	Building Height – H (m)							
	H≤5			5<H≤10			10<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1612**	**1964**		**1314**	**1622**		**1114**	**1372**
B	**1070**	**1317**		**877**	**1077**		**746**	**915**
C	**691**	**846**		**568**	**695**		**485**	**592**
D	**445**	**544**		**367**	**448**		**314**	**383**

Roof Angle (Φ) – $5° \leqslant \Phi \leqslant 30°$

Wind Region	Building Height – H (m)							
	H≤5			5<H≤10			10<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1612**	**2087**		**1314**	**1923**		**1114**	**1622**
B	**1070**	**1557**		**877**	**1269**		**746**	**1077**
C	**691**	**995**		**568**	**816**		**485**	**695**
D	**445**	**638**		**367**	**525**		**314**	**448**

D.W & U.W – Downwind and Upwind refer to note 3.

Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Roof Angle (Φ) – 30°< Φ ⩽ 60°

Wind Region	Building Height – H (m)								
	H≤5			5<H≤10			10<H≤20		
	Intermediate	**Internal**		**Intermediate**	**Internal**		**Intermediate**	**Internal**
A	**2062**	**2290**		**1958**	**2184**		**1822**	**2097**
B	**1748**	**2231**		**1422**	**2125**		**1205**	**1874**
C	**1113**	**1726**		**911**	**1405**		**776**	**1190**
D	**712**	**1091**		**585**	**893**		**499**	**760**

Intermediate and Internal roof zone refer to note 3.

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Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **Jul-18**
Checked: **J.G**

General Notes

Note 1

Following components are satisfied to use according to AS/NZS 1170.2-2011		
Components	**Part Number**	**Description**
Light Rail	ATL-TYN-53	as per test report MT-18/022 by Melbourne Testing Services
Rail Splice	ATL-TYN-21	as per test report MT-18/022 by Melbourne Testing Services
Tile Hook Bracket	AU001	as per test report MT-14/473 by Melbourne Testing Services
L-foot Bracket	ATL-TWNY-05	as per test report MT-18/377 by Melbourne Testing Services
Inner Panel Clamp	ATL-FWNY-09	internal fixing between rail and PV panel
End Panel Clamp	ATL-TYN-14	end fixing between rail and PV panel
Inner Panel Clamp 2	ATL-GN-003	internal fixing between rail and PV panel

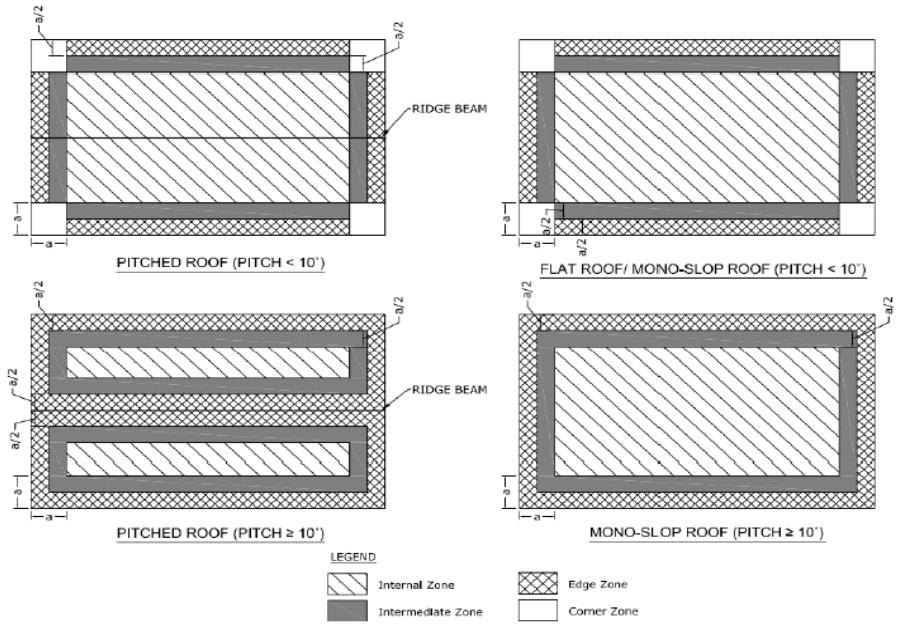
Note 2

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 obstruction per obstructions per hectare.

Terrain category 3(TC3) refers to numerous closely spaced obstructions having heights generally from 3 m to 10 m. For example suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011(R2016) for definition of Terrain category 3.

Note 3

For the definition of Downwind, Upwind end and central, refer figure D9 from AS/NZS 1170.2-2011.
For the definition of Intermediate and Internal roof zone, refer the following figure.
Corner and Edge zone are recommended exclusion zone.



Note 4

Screw embedment is minimum 35 mm into timber.

Note 5

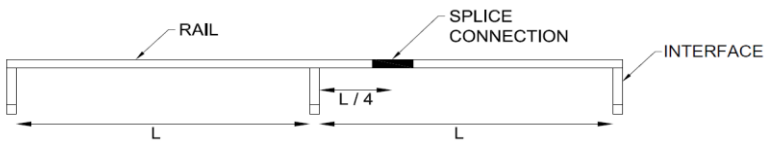
Recommended Screws

Metal Purlin/Batten	**Fasteners to Use**
Non-cyclonic Region	Buildex 14g-10 TPI Teks screws
Cyclonic Region	Buildex M6 RoofZips screws
Timber Rafter & Purlin/Batten	**Fasteners to Use**
Softwood and Hardwood (35mm embedment depth or more)	Buildex 14g-10 TPI (T17s) screws

Note: The spacing tables are applicable to minimum 1.9mm BMT steel purlin and JD4 seasoned timber.

Note 6

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 7

Recommended number of panel clamps required per panel

Wind Region	TC2	TC3
A	4	4
B	4	4
C	6	4
D	8	6

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Structural Design Documentation

Tin Roof Flush Mount Solar System
Interface Spacing Table
According to AS/NZS 1170.2-2011 (R2016)
with CG010 Rails
within Australia

Terrain Category 2 & 3

For:

Proud Member of: CONSULT AUSTRALIA Representing Engineering Excellence

Job Number: 4769
Date: 17 May 2018

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ISO 9001:2008 Registered Firm
Certificate No: AU1222

Job No: **4769**

Client:

Project: **Tin Roof Flush Mount Interface Spacing Table**

Address: **within Australia**

Australian Standards

AS/NZS 1170 – Structural Design Actions
Part 0 -2002 – General Principles
Part 1 -2002 – Permanent imposed and other actions
Part 2 -2011(R2016) – Wind Actions
AS 4055 -2012 – Wind Loads for Housing
AS/NZS 1664 -1997 – Aluminium Structures
AS 4100 -1998(R2016) – Steel Structures
AS/NZS 4600 -2005 – Cold-Formed Steel Structures

Wind Terrain Category: WTC 2 & 3

Designed: **K.Z**

Date: **May-18**

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Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Flush Mount Interface Spacing Table

Type of Rail	CG-010
Type of Interface	ATL-FWNY-05
Solar Panel Dimension	2.0m x 1.0m
Terrain category	**3**

Roof Angle (Φ) – $0° \leqslant \Phi < 5°$

Wind Region	Building Height – H (m)							
	H≤10			10<H≤15			15<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1590**	**1716**		**1507**	**1624**		**1446**	**1556**
B	**1303**	**1609**		**1122**	**1382**		**999**	**1229**
C	**837**	**1027**		**723**	**886**		**646**	**790**
D	**538**	**658**		**466**	**570**		**417**	**509**

Roof Angle (Φ) – $5° \leqslant \Phi \leqslant 30°$

Wind Region	Building Height – H (m)							
	H≤10			10<H≤15			15<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1590**	**1828**		**1507**	**1726**		**1446**	**1653**
B	**1303**	**1750**		**1122**	**1635**		**999**	**1451**
C	**837**	**1211**		**723**	**1043**		**646**	**929**
D	**538**	**773**		**466**	**668**		**417**	**597**

D.W & U.W – Downwind and Upwind refer to note 3.

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Relationships built on trust

Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Roof Angle (Φ) – 30°< Φ ⩽ 60°

Wind Region		Building Height – H (m)							
		H≤10			10<H≤15			15<H≤20	
		Intermediate	**Internal**		**Intermediate**	**Internal**		**Intermediate**	**Internal**
A		**1759**	**1944**		**1696**	**1881**		**1646**	**1831**
B		**1711**	**1896**		**1648**	**1833**		**1599**	**1782**
C		**1356**	**1733**		**1167**	**1670**		**1039**	**1607**
D		**863**	**1328**		**746**	**1143**		**665**	**1018**

Intermediate and Internal roof zone refer to note 3.

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Relationships built on trust

Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Flush Mount Interface Spacing Table

Type of Rail	CG-010
Type of Interface	ATL-FWNY-05
Solar Panel Dimension	2.0m x 1.0m
Terrain category	**2**

Roof Angle (Φ) – $0° \leqslant \Phi < 5°$

Wind Region	Building Height – H (m)							
	H≤5			5<H≤10			10<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1482**	**1596**		**1314**	**1485**		**1114**	**1372**
B	**1070**	**1317**		**877**	**1077**		**746**	**915**
C	**691**	**846**		**568**	**695**		**485**	**592**
D	**445**	**544**		**367**	**448**		**314**	**383**

Roof Angle (Φ) – $5° \leqslant \Phi \leqslant 30°$

Wind Region	Building Height – H (m)							
	H≤5			5<H≤10			10<H≤20	
	D.W & U.W	**Central**		**D.W & U.W**	**Central**		**D.W & U.W**	**Central**
A	**1482**	**1696**		**1314**	**1575**		**1114**	**1485**
B	**1070**	**1557**		**877**	**1269**		**746**	**1077**
C	**691**	**995**		**568**	**816**		**485**	**695**
D	**445**	**638**		**367**	**525**		**314**	**448**

D.W & U.W – Downwind and Upwind refer to note 3.

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Relationships built on trust

Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **May-18**
Checked: **J.G**

Roof Angle (Φ) – 30°< Φ ⩽ 60°

Wind Region	Building Height – H (m)								
	H≤5			5<H≤10			10<H≤20		
	Intermediate	**Internal**		**Intermediate**	**Internal**		**Intermediate**	**Internal**	
A	**1675**	**1860**		**1591**	**1774**		**1523**	**1704**	
B	**1628**	**1812**		**1422**	**1726**		**1205**	**1656**	
C	**1113**	**1650**		**911**	**1405**		**776**	**1190**	
D	**712**	**1091**		**585**	**893**		**499**	**760**	

Intermediate and Internal roof zone refer to note 3.

gamcorp
Relationships built on trust

Client:
Project: **Flush Mount Interface Spacing Table**
Address: **within Australia**
Designed: **K.Z**

Job: **4769**
Date: **Jul-18**
Checked: **J.G**

General Notes

Note 1

Following components are satisfied to use according to AS/NZS 1170.2-2011		
Components	**Part Number**	**Description**
Light Rail 2	CG-010	as per test report MT-18/022 by Melbourne Testing Services
Rail Splice	ATL-TYN-29/54	as per test report MT-18/022 by Melbourne Testing Services
Tile Hook Bracket	AU001	as per test report MT-14/473 by Melbourne Testing Services
L-foot Bracket	ATL-TWNY-05	as per test report MT-18/377 by Melbourne Testing Services
Inner Panel Clamp	ATL-FWNY-09	internal fixing between rail and PV panel
End Panel Clamp	ATL-TYN-14	end fixing between rail and PV panel
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Note 2

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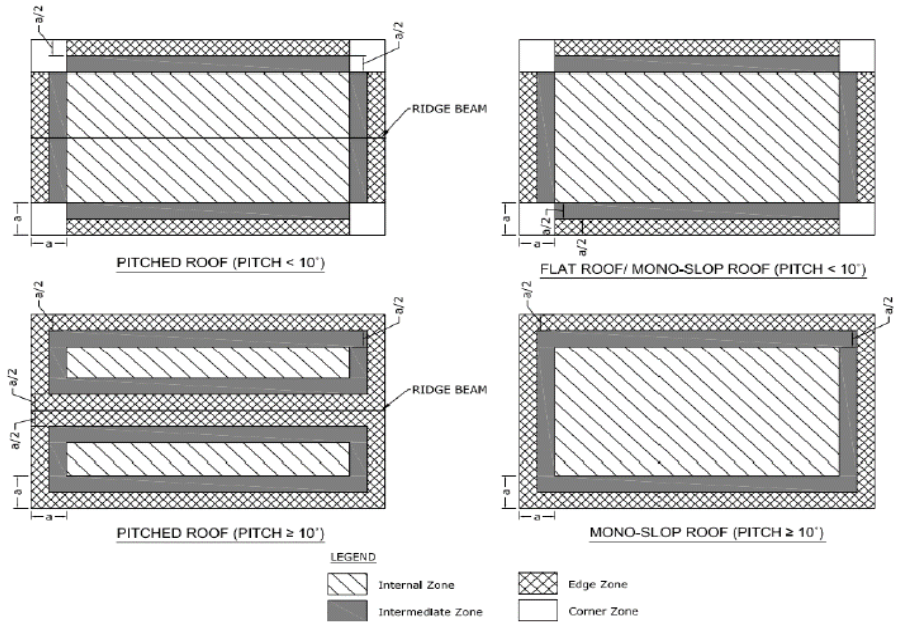
Corner and Edge zone are recommended exclusion zone.



Note 4

Screw embedment is minimum 35 mm into timber.

Note 5

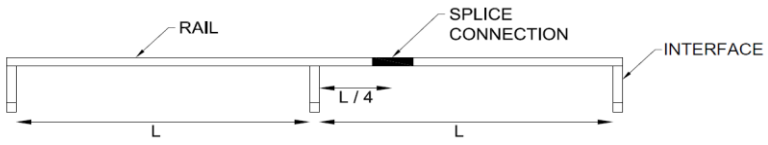
Recommended Screws

Metal Purlin/Batten	**Fasteners to Use**
Non-cyclonic Region	Buildex 14g-10 TPI Teks screws
Cyclonic Region	Buildex M6 RoofZips screws
Timber Rafter & Purlin/Batten	**Fasteners to Use**
Softwood and Hardwood (35mm embedment depth or more)	Buildex 14g-10 TPI (T17s) screws

Note: The spacing tables are applicable to minimum 1.9mm BMT steel purlin and JD4 seasoned timber.

Note 6

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 7

Recommended number of panel clamps required per panel

Wind Region	TC2	TC3
A	4	4
B	4	4
C	6	4
D	8	6

Harvest the Sunshine

Mono

395W PERC Module

JAM72S09 375-395/PR Series

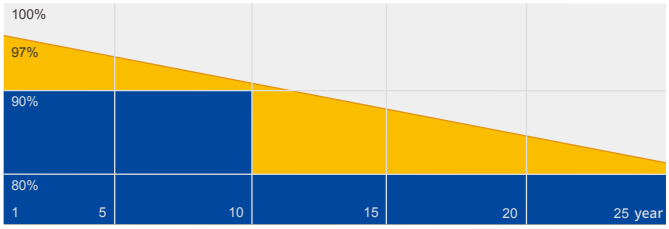
Introduction

Powered by high-efficiency PERCIUM cells, this series of high-performance modules provides the most cost-effective solution for lowering the LCOE of any PV systems large or small.

- 5BB — 5 busbar solar cell design
- Higher output power
- Excellent low-light performance
- Lower temperature coefficient

Superior Warranty

- 12-year product warranty
- 25-year linear power output warranty



JA Linear Power Warranty ■ Industry Warranty

Comprehensive Certificates

- IEC 61215, IEC 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- OHSAS 18001: 2007 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

JA SOLAR

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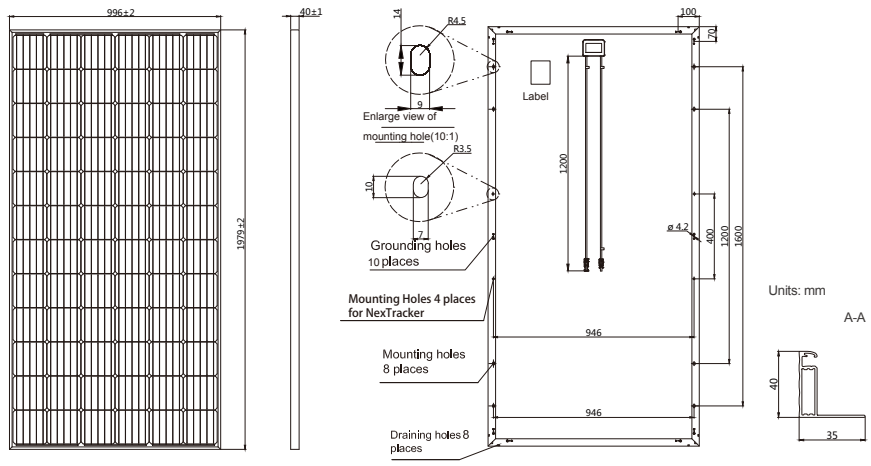
JAM72S09 375-395/PR Series

MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	22.3kg±3%
Dimensions	1979±2mm×996±2mm×40±1mm
Cable Cross Section Size	4mm²
No. of cells	72(6x12)
Junction Box	IP67, 3 diodes
Connector	QC 4.10 (1000V) QC 4.10-35(1500V)
Packaging Configuration	27 Per Pallet

ELECTRICAL PARAMETERS AT STC

TYPE	JAM72S09 -375/PR	JAM72S09 -380/PR	JAM72S09 -385/PR	JAM72S09 -390/PR	JAM72S09 -395/PR
Rated Maximum Power(Pmax) [W]	375	380	385	390	395
Open Circuit Voltage(Voc) [V]	48.47	48.75	49.04	49.35	49.64
Maximum Power Voltage(Vmp) [V]	39.27	39.59	39.90	40.21	40.48
Short Circuit Current(Isc) [A]	10.06	10.12	10.17	10.22	10.27
Maximum Power Current(Imp) [A]	9.55	9.60	9.65	9.70	9.76
Module Efficiency [%]	19.0	19.3	19.5	19.8	20.0
Power Tolerance	0~+5W				
Temperature Coefficient of Isc(α_Isc)	+0.060%/°C				
Temperature Coefficient of Voc(β_Voc)	-0.300%/°C				
Temperature Coefficient of Pmax(γ_Pmp)	-0.370%/°C				
STC	Irradiance 1000W/m², cell temperature 25°C, AM1.5G				

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.
*For NexTracker installations static loading performance: front load measures 2400Pa, while back load measures 2400Pa.

ELECTRICAL PARAMETERS AT NOCT

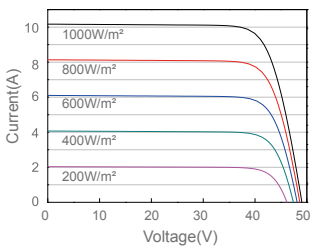
TYPE	JAM72S09 -375/PR	JAM72S09 -380/PR	JAM72S09 -385/PR	JAM72S09 -390/PR	JAM72S09 -395/PR
Rated Max Power(Pmax) [W]	278	281	285	289	292
Open Circuit Voltage(Voc) [V]	45.86	46.15	46.47	46.78	47.09
Max Power Voltage(Vmp) [V]	37.05	37.34	37.64	37.92	38.21
Short Circuit Current(Isc) [A]	7.95	7.99	8.03	8.07	8.11
Max Power Current(Imp) [A]	7.49	7.53	7.57	7.61	7.65
NOCT	Irradiance 800W/m², ambient temperature 20°C, wind speed 1m/s, AM1.5G				

OPERATING CONDITIONS

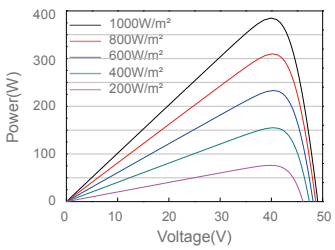
Maximum System Voltage	1000V/1500V DC(IEC)
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	20A
Maximum Static Load,Front*	5400Pa
Maximum Static Load,Back*	2400Pa
NOCT	45±2°C
Application Class	Class A

CHARACTERISTICS

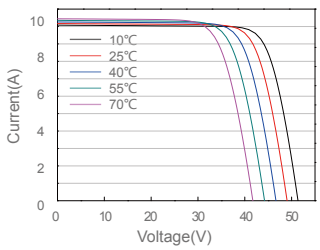
Current-Voltage Curve JAM72S09-385/PR



Power-Voltage Curve JAM72S09-385/PR



Current-Voltage Curve JAM72S09-385/PR



7 January 2020

Attention	
Project:	Proposed 259 x JAM72S09-385/PR/1000V solar panel installation
Site Address	138 Avon Terrace York
Job No	pln_50820/tsk_121035

Re: Proposed PV panel installation

Photo 1 Eastern Elevation of 138 Avon Terrace York

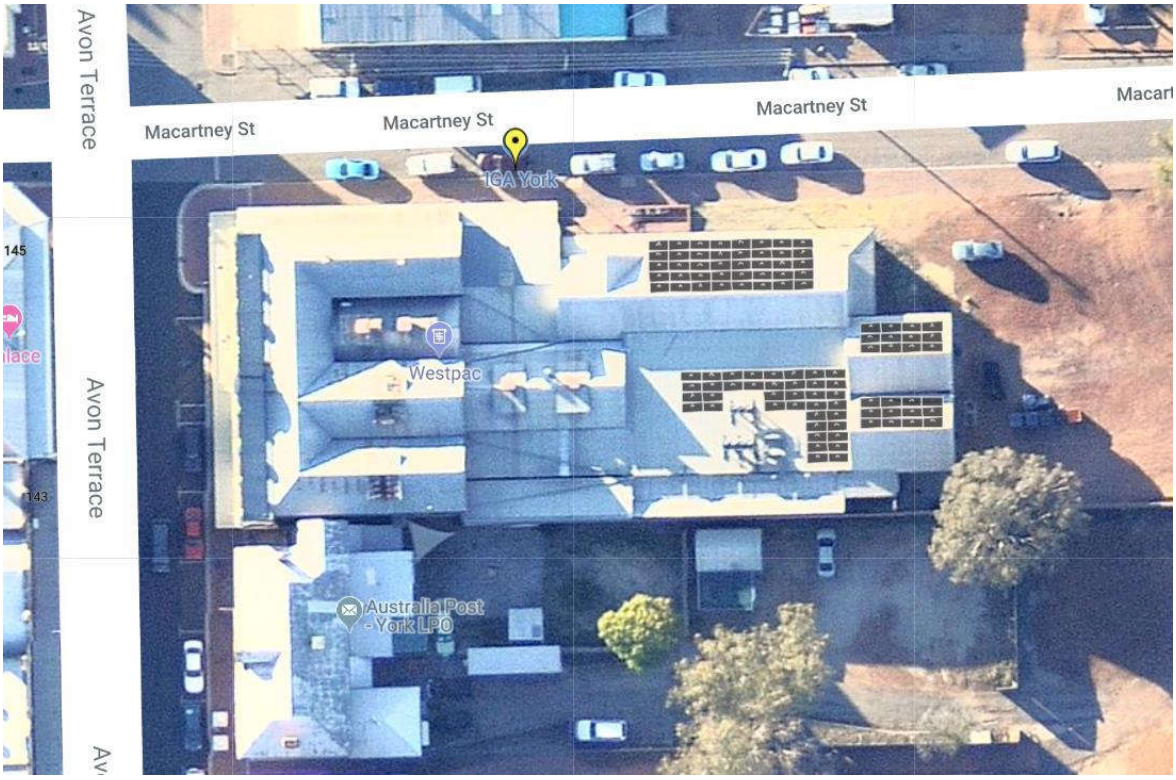
1. Introduction

Prompt Engineering has been requested to report on the structural adequacy of the existing structure for the installation of solar panels onto the roof of the abovementioned site.

A previous report pln_50820/task-119906 for a lesser array at the rear of the building was completed early in December 2019.

The inspection at the time indicated that the section of building extending back from the original two-story structure was structurally adequate for the proposed solar panel installation.

The original two-story structure was not inspected for this proposal.



Original Solar Panel Proposal

The Solar Panels being installed will have maximum dimensions of 2m x 1m and mass not exceeding 22kg per panel and will be installed on proprietary mounting system fixed to the roof purlins parallel to the roof.

2. Executive summary

This report is not a certification of the structural integrity of any existing structure/s, nor has it involved detailed analysis of the entire building structural design to determine whether it is capable of withstanding ultimate design loads in accordance with the design parameters applicable at the time of construction.

This report only certifies loads that will be applied by installation of proposed solar panels and will not adversely effects on the structural integrity of the building and future performance.

Prompt Engineering does not take responsibility for the ongoing performance of the building, which was and remains the responsibility of the owner and/or builders, subject to the relevant construction liability periods and insurance policies.

3. Building Remarks

Inspection was carried out to survey the original two-story building on Thursday 19 December 2019 in order to comment upon whether the roof structure will be adversely affected by the proposed installation of the solar panels.

The existing two-story structure consists of masonary walls, with a metal roof cover installed over timber shingles. The pitched roof is at approximately 38 degrees.

The rear rooms are 6.3m wide separated by a masonry wall.

The front room extends the width of the two rear rooms.

The roof is supported by 150x 50 hardwood rafters spaced at 600c/c, spanning 4000mm to a 200x38 ridge board. No tie downs could be observed for the rafters.

There are no under purlins or pitching beams.

The roof to the rear rooms has 170x70 hardwood tie beams spaced at approximately 2400 centres. These beams are not connected to the rafters. Tie downs could not be observed.

The front room has no tie beams. There are three timber sections fanned out from the middle masonry wall. These beams do not appear to have end tie downs, or any connection to the main roof structure.

A dormer window approximately 4.8m long is located approximately central to the rear rooms.

Rear Pitch Roof

Three splayed Timber Members across the Front Room

4. Design Considerations

The proposed revised solar panel arrangement is as per the following image.

The site design details are summarized in the original Prompt Engineering report pln_50820 tsk 119906.

The conclusion of that structural check, which was limited to the section of building behind the original two-story building was that this section of the building was considered structurally adequate for the extra loads imposed by the solar panels. The building structural performance satisfied the requirements of NCC.

The original two-story structure has a roof that does not comply with the requirements of present Australian codes. This roof is not structurally adequate to support the proposed solar panels.

5. Conclusion

The conclusion of structural check is that, the section of building behind the original two-story building is structurally adequate for the extra loads imposed by the solar panels. This part of the overall building structural performance satisfies the requirements of NCC.

The original two-story building roof structure is not structurally adequate to support the proposed solar panels with out extra support being provided.

Please do not hesitate to contact this office should you have further queries.

Yours Sincerely,

Prompt Engineering Pty Ltd

PROMPT ENGINEERING

MICHAEL YOUNG BE MIE (276533)
PLN_50820,07-01-2020

DOME CONSULTING (Aust)

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

DOME
CONSULTING (Aust)

Our Ref: 21170

January 2019

Fujian Antai New Energy Tech. Co., Ltd.

Structural Design Summary Table

Roof Mounting System with Type T Rail

For

in accordance to AS1170.2 2011 Amdt 5 - June 2017

Terrain Category 3

DOME CONSULTING (Aust)

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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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

DOME CONSULTING (Aust)

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

For Up To 2000m Long Panels (2 Rails) Max. Support Spacing (mm)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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° < a < 20° TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails) Max. Support Spacing (mm)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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° < a < 30° TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails) Max. Support Spacing (mm)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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° < a < 60° TG.3 Type T Rail Roof Mounting System

For Up To 2000m Long Panels (2 Rails) Max. Support Spacing (mm)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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

DOME
CONSULTING (Aust)

Notes

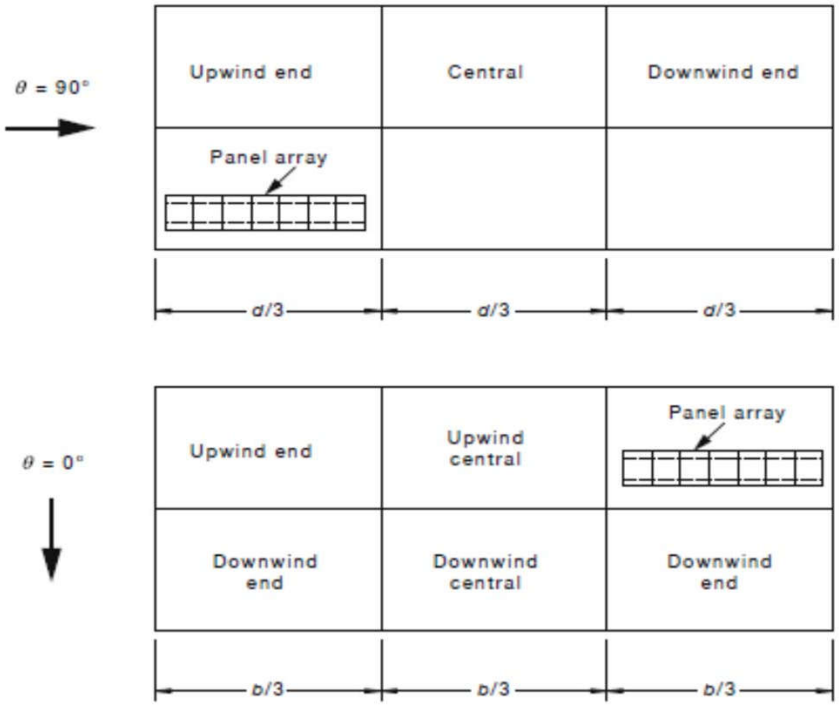
* Minimum 35mm embedment length into timber
* Please note that the screws provided with our products are designed for mounting in to wooden and metal structures. ANTAI Solar recommend using 13-11x50 RoofStars - Self Drilling Screws from ICONS® to fix to steel purlins.
* Above spacing based on 1.9mm steel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

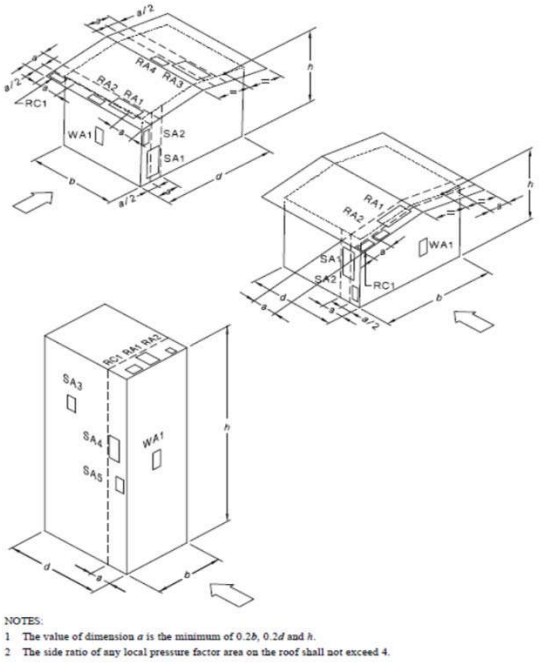
Material	Wind region C			Wind region C	
	Centre	Edge		Centre	Edge
0.55mm steel batten	22%	25%		30%	42%
0.75mm steel batten	n/a	n/a		10%	5%

* 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

in accordance to AS1170.2 2011 Amdt 5 - June 2017

Terrain Category 2

DOME CONSULTING (Aust)

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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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

DOME CONSULTING (Aust)

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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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)								
Installtion	Region A		Region B			Region C		Region D	
Height (m)	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

DOME
CONSULTING (Aust)

Notes

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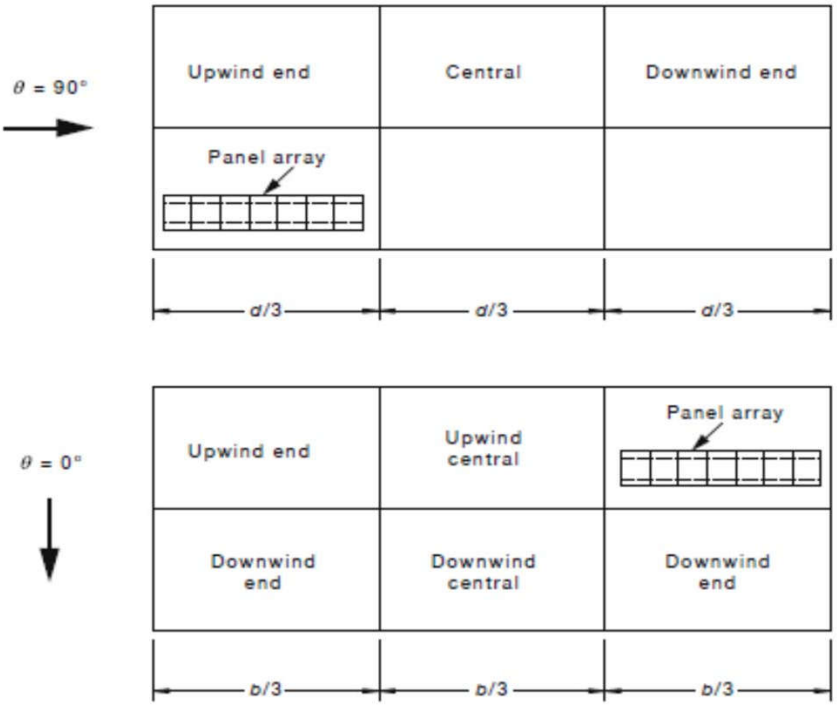

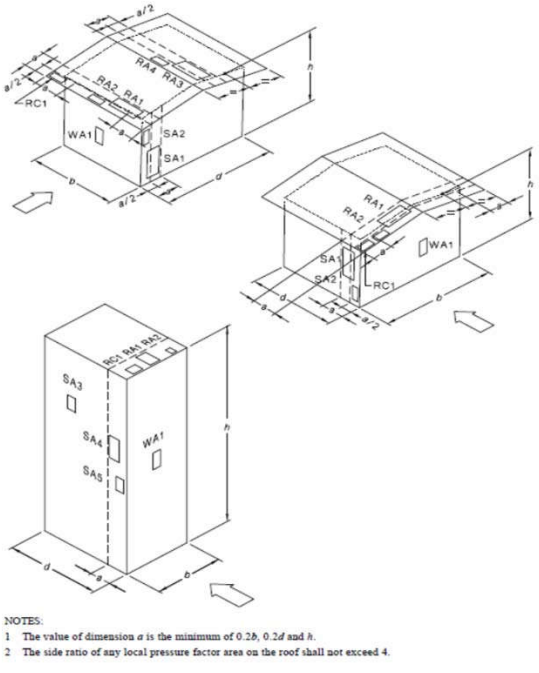

NOTES:
1 The value of dimension *a* is the minimum of 0.2*b*, 0.2*d* and *h*.
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