

SPACEMAKER 1000 WIND LOAD SPAN TABLE



In accordance with: - Wind actions: AS/NZS 1170.2:2011 - Clauses 5.3, 5.4 and D4;
 AS 4055-2012.
 Imposed load on roof: AS/NZS 1170.1:2002 - Clause 3.5: 1.1 kN
 (110kg) per panel, concentrated load for typical foot-traffic.

Wind Class in accordance with AS4055-2012	Panel Size (mm)	Maximum Single Span (mm)		
		Fully Enclosed Room	One-Side Open	Two/Three Sides Open
N1 (W28N)	50	7039	6533	7039
	75	8557	7716	8557
	100	9367	8508	9367
	125	10508	9475	10508
	150	11407	10285	11407
N2 (W33N)	50	6275	5690	6275
	75	7123	6459	7123
	100	7853	7121	7853
	125	8746	7931	8746
	150	9494	8609	9494
N3 (W41N)	50	4939	4487	4939
	75	5606	5093	5606
	100	6181	5616	6181
	125	6883	6254	6883
	150	7473	6789	7473
N4 (W50N)	50	4013	3649	4013
	75	4555	4142	4555
	100	5023	4567	5023
	125	5593	5086	5593
	150	6072	5521	6072
C1 (W41C)	50	4697	3744	4939
	75	5331	4250	5606
	100	5878	4686	6181
	125	6546	5218	6883
	150	7106	5665	7473
C2 (W50C)	50	3822	3055	4013
	75	4339	3467	4555
	100	4784	3823	5023
	125	5327	4257	5593
	150	5783	4622	6072
C3 (W60C)	50	3132	2509	3289
	75	3555	2847	3733
	100	3919	3140	4116
	125	4365	3496	4584
	150	4738	3796	4977

Notes:

- This Table is based on Structural Insulated Roof Panels (SIRP) manufactured with insulation butt-joint located at center (mid-span) as in SIRP used in structural load tests.**
- This table shall be studied in conjunction with information included in this document on: Sheet 2 of 4, Sheet 3 of 4 and Sheet 4 of 4**

Fixing Detail:

1. Fixed to support member with 14g self-drilling screws at every crest
2. Typically 3-off screws to each panel, at each support.
3. Uplift load capacity of fixing to supporting members shall be based on engineering advice: - 1) Screw pull-out; and 2) Screw pull-over; and 3) Depth of penetration in to supporting members.

Cyclonic Fixing:

1. Fixed to support member with 14g self-drilling screws at every crest with cyclone assemblies or washers suitable to the profile shape of the top sheet.
2. Typically 3-off screws and cyclone assemblies or washers to each panel, at each support.
3. Uplift load capacity of fixing to supporting members shall be based on engineering advice: - 1) Screw pull-out; and 2) Screw pull-over; and 3) Depth of penetration in to supporting members.

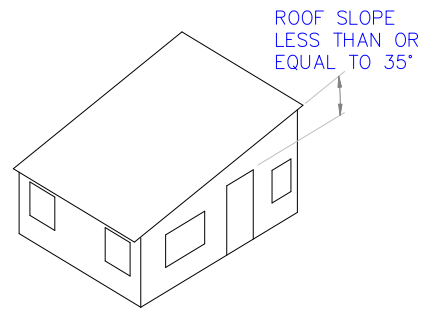
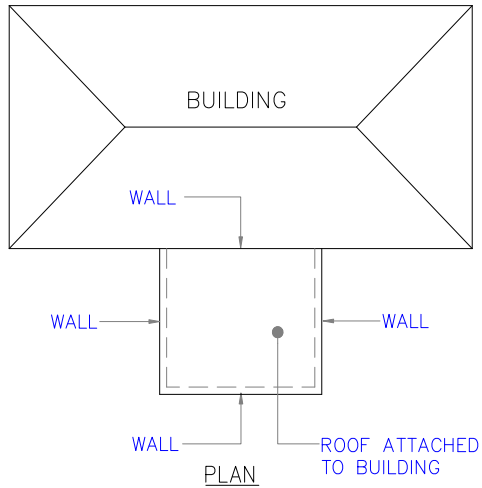
Panel Overhang:

1. Maximum span overhang in direction of panel length = 25% of allowable span.
2. Maximum side overhang in direction of panel width = 450 mm

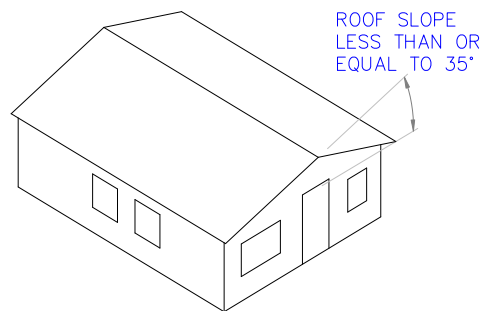
NOTES applicable to Span Tables:

1. All windows included in the building shall be rated N1, N2, N3, N4, C1, C2, C3, in accordance with AS 2047 (latest revision): - Windows and external glazed doors in buildings.
2. All glass included in the building shall be rated N1, N2, N3, N4, C1, C2, C3, in accordance with AS 1288 (latest revision): - Glass in buildings - Selection and Installation.
3. For buildings in cyclonic wind regions, the building envelope (windows, doors and cladding) shall be capable of resisting impact loading from windborne debris in accordance with Clause 5.3.2 - Openings and Clause 2.5.8 - Impact Loading from Windborne Debris, in AS/NZS 1170.2:2011.
4. Performance of the installed SPACEMAKER structural insulated roof panels due to thermal expansion and contraction shall be verified by the Architect or Building Designer based on local weather and climate.

Full Enclosed Room

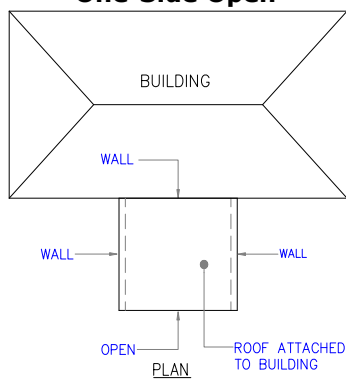


SKILLION OR LEAN TO ROOF OF ISOLATED BUILDING

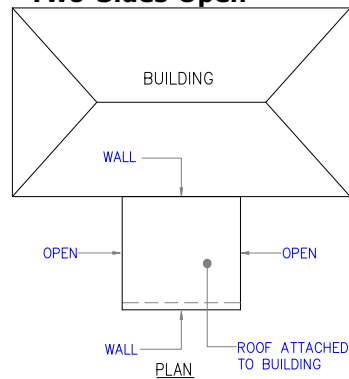


GABLE ROOF OF ISOLATED BUILDING

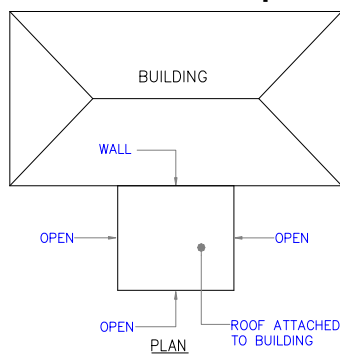
One-Side Open



Two-Sides Open



Three-Sides Open



This span table and structural engineering certification is based on:

1. Referenced Building Code of Australia [1] and Australian Standards [2] to [11];
2. Referenced design manual [12] and Research Report [13];
3. Structural load testing; and
4. Structural analysis and design calculations held on file.

The adequacy of the structural insulated roof panels for cyclonic wind loading is based on:

- 1) Documented adequacy of the performance of corrugated roofing when alternate crests are fastened with cyclone assemblies or washers when the region around the fastener (self-drilling screws) is free of large stress concentrations [13].
- 2) Fatigue behaviour is very much dependent on the local plastic buckling deformation load on the fastener [13]. The imposed load on a fastener for the recommended spans is restricted to below the local plastic buckling deformation load including a factor of safety.
- 3) Interpretation of recommendations in AS/NZS 4600:2019 [9] for fatigue including screw connections subject to cyclic loading
- 4) Evidence from field or site in cyclonic wind regions in the last 20 years that structural insulated roof panels installed to supporting members in accordance with recommendations in this document have performed adequately [14].

Kishore Honavar

MIEAust CPEng - Chartered Professional Engineer 733503
National Engineering Register (NER) – Engineers Australia. APEC Engineer IntPE(Aus)
Registered Professional Engineer of Queensland – RPEQ 7652
Registered Engineer Civil in Victoria – Reg No. EC 40393
Director & Principal Engineer - Innovative Construction Engineering Solutions Pty Ltd

References:

- [1] [National Construction Code, Volume Two, Building Code of Australia 2019.](#)
[Australian Building Codes Board.](#)
- [2] [Australian/New Zealand Standard AS/NZS1170.0:2002 Structural design actions](#) – General principles.
- [3] [Australian/New Zealand Standard AS/NZS1170.0 Supp 1:2002 \(R2016\) Structural design actions](#) – General principles – Commentary (Supplement to AS/NZS 1170.0:2002).
- [4] [Australian/New Zealand Standard AS/NZS1170.1:2002 Structural design actions](#) – Permanent, imposed and other actions.
- [5] [Australian/New Zealand Standard AS/NZS1170.1 Supp 1:2002 Structural design actions](#) – Permanent, imposed and other actions – Commentary (Supplement to AS/NZS 1170.1:2002).
- [6] [Australian/New Zealand Standard AS/NZS1170.2:2011 Structural design actions, Part 2: Wind actions.](#)
- [7] [Australian/New Zealand Standard AS/NZS1170.2:2002 Structural design actions](#) – Wind actions – Commentary (Supplement to AS/NZS 1170.2:2002).
- [8] Australian Standard AS 4055-2012 Wind loads for housing.
- [9] [Australian/New Zealand Standard AS/NZS 4600:2018 Cold-formed steel structures](#)
- [10] Australian Standard AS 3566.1-2002 (R2015) Self-drilling screws for the building and construction industries, Part 1: General requirements and mechanical properties
- [11] Australian Standard AS 3566.2-2002 Self-drilling screws for the building and construction industries, Part 2: Corrosion resistance requirements
- [12] Gregory J. Hancock, Design of Cold-Formed Steel Structures (To Australian/New Zealand Standard AS/NZS 4600:2005), Australian Steel Institute, Fourth Edition, 2007.
- [13] M. Mahendran, Fatigue behaviour of corrugated roofing under cyclic wind loading, Technical Report No. 35, May 1989, Cyclone Testing Station.
- [14] Discussions and communications with Versiclad Pty Ltd.