

     	 <p>STRUCTURAL ENGINEERS NSW VIC QLD WA TAS </p>
<p>DESIGNDEVISE DesignDevise Pty Ltd ABN 40 651 752 260</p>	<p>Level 3, 480 Collins St. MELBOURNE VIC 3000 vic@ddl.com.au</p>
<p>STRUCTURAL CERTIFICATE</p>	

Ref: DD-231232-CERT-C2

8 January 2024

Schletter Australia Pty Ltd
Unit 4, 27 Williamson Road
INGLEBURN NSW 2565

RE: SPAN TABLES FOR SCHLETTER FASTENERS WITH FIX-Z PRO SYSTEM FOR ROOF TILT SOLAR PANELS INSTALLATION

This is to certify that DesignDevise (**DD**) have calculated the span tables for Schletter's fasteners with Fiz-Z Pro rail system for roof tilt solar panels installation.

The span tables are documented in the following drawings (Refer **Appendix A**):

- DD-231232-ST-C2, Sheet S01, Rev. C2, dated 08.01.2024.

DD confirms that the spans have been calculated using accepted engineering principles and in accordance with the requirements of the following Australian Standards and Specifications:

- AS/NZS 1170.0: 2002 Structural Design Actions – Part 0: General Principles;
- AS/NZS 1170.1: 2002 Structural Design Actions – Part 1: Permanent, Imposed and other Actions;
- AS/NZS 1170.2: 2021 Structural Design Actions – Part 2: Wind Actions;
- AS/NZS 1664.1: 1997 Aluminium Structures - Limit State Design.

Proprietary products, parameters, limitations, and assumptions used to calculate spans are listed in the above-mentioned drawings.

Yours faithfully

RANA WASEEM

Principal Structural Engineer



CPEng MIEAust NER: 5737360 (Structural)
Professional Engineer (NSW) PRE0001775 (Civil/Structural)
Design Practitioner (NSW) DEP0003296 (Structural)
BLA (VIC): PE0002622 (Civil)
RPEQ (QLD): 24524 (Structural)

Enc:

- Appendix A – Span Table Drawing

						
DESIGNDEVISE DesignDevise Pty Ltd ABN 40 651 752 260		Level 3, 480 Collins St. MELBOURNE VIC 3000 vic@ddl.com.au			STRUCTURAL ENGINEERS NSW VIC QLD WA TAS	
STRUCTURAL CERTIFICATE						

Appendix A

Span Table Drawing

WIND REGION A - FIX-Z PRO SPAN TABLES FOR CENTRAL ZONE

V200 = 43m/s

(* denotes not suitable due to force exceeding 2.43kN in the elevation parts)

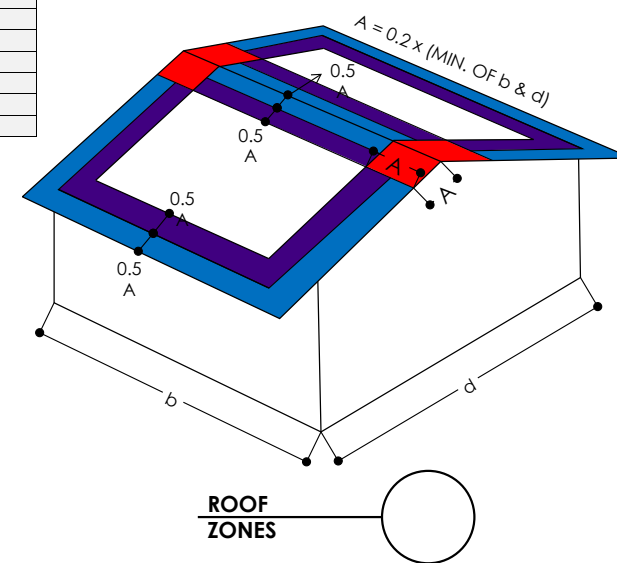
TC	PITCH	H	ω = 5°				ω = 10°				ω = 15°			
			RAPID2+ PRO SML	KLIPOK EMU		SINGLE FIX PRO TRIMFIX EMU PROLINE KINGFIX EMU PROLINE	RAPID2+ PRO SML	KLIPOK EMU		SINGLE FIX PRO TRIMFIX EMU PROLINE KINGFIX EMU PROLINE	RAPID2+ PRO SML	KLIPOK EMU		SINGLE FIX PRO TRIMFIX EMU PROLINE KINGFIX EMU PROLINE
				ON-PURLIN	OFF-PURLIN			ON-PURLIN	OFF-PURLIN			ON-PURLIN	OFF-PURLIN	
TC2	0° to <7°	0 to 5m	1,722	1,722	1,086	1,539	1,558	1,558	888	1,258	1,439	1,439	758	1,074
		>5 to 10m	1,551	1,551	881	1,249	1,406	1,387	723	1,025	1,253	1,186	619	877
		>10 to 15m	1,471	1,471	792	1,122	1,319	1,249	651	923	1,129	1,069	558	790
		>15 to 20m	1,427	1,427	745	1,056	1,242	1,176	613	869	1,064	1,007	525	744
		>20 to 25m	1,383	1,383	698	987	1,137	1,071	575	800	1,020	963	487	706
TC2.5	7° to 15°	0 to 5m	1,587	1,587	923	1,307	1,422	1,420	741	1,050	1,259	1,192	622	881
		>5 to 10m	1,432	1,432	751	1,064	1,226	1,160	605	858	1,031	976	509	721
		>10 to 15m	1,359	1,296	676	958	1,105	1,046	546	773	930	881	459	651
		>15 to 20m	1,290	1,221	637	902	1,041	986	514	728	877	830	433	614
		>20 to 25m	1,246	1,177	598	858	991	935	475	689	836	789	394	575
TC3	0° to <7°	0 to 5m	1,812	1,812	1,202	1,702	1,637	1,637	981	1,389	1,511	1,511	836	1,184
		>5 to 10m	1,701	1,701	1,060	1,501	1,539	1,539	867	1,229	1,422	1,418	740	1,048
		>10 to 15m	1,604	1,604	942	1,335	1,453	1,453	773	1,095	1,337	1,266	660	936
		>15 to 20m	1,535	1,535	862	1,222	1,391	1,357	708	1,003	1,227	1,161	606	858
		>20 to 25m	1,491	1,422	781	1,183	1,352	1,318	669	954	1,179	1,113	567	820
TC3	7° to 15°	0 to 5m	1,668	1,668	1,019	1,443	1,493	1,493	817	1,157	1,367	1,312	685	970
		>5 to 10m	1,568	1,568	901	1,276	1,406	1,387	724	1,025	1,230	1,164	607	861
		>10 to 15m	1,480	1,480	802	1,137	1,308	1,238	646	915	1,099	1,041	543	769
		>15 to 20m	1,417	1,409	735	1,042	1,200	1,136	593	840	1,010	956	499	706
		>20 to 25m	1,373	1,304	654	995	1,154	1,089	515	766	961	902	420	667
TC3	0° to <7°	0 to 5m	1,911	1,911	1,338	1,895	1,725	1,725	1,089	1,543	1,591	1,591	926	1,312
		>5 to 10m	1,911	1,911	1,338	1,895	1,725	1,725	1,089	1,543	1,591	1,591	926	1,312
		>10 to 15m	1,766	1,766	1,142	1,617	1,576	1,596	933	1,321	1,474	1,474	795	1,127
		>15 to 20m	1,661	1,661	1,010	1,431	1,503	1,503	827	1,172	1,389	1,354	707	1,001
		>20 to 25m	1,617	1,548	931	1,387	1,459	1,459	788	1,128	1,345	1,310	658	952
TC3	7° to 15°	0 to 5m	1,758	1,758	1,131	1,603	1,572	1,572	905	1,282	1,438	1,438	758	1,073
		>5 to 10m	1,758	1,758	1,131	1,603	1,572	1,572	905	1,282	1,438	1,438	758	1,073
		>10 to 15m	1,627	1,627	969	1,372	1,457	1,457	777	1,101	1,320	1,250	652	924
		>15 to 20m	1,532	1,532	859	1,217	1,374	1,324	691	979	1,175	1,112	580	822
		>20 to 25m	1,488	1,419	780	1,173	1,330	1,280	652	935	1,131	1,067	541	793

WIND REGION B1, B2 - FIX-Z PRO SPAN TABLES FOR CENTRAL ZONE

V200 = 52m/s

(* denotes not suitable due to force exceeding 2.43kN in the elevation parts)

TC	PITCH	H	ω = 5°				ω = 10°				ω = 15°			
			RAPID2+ PRO SML	KLIPOK EMU		SINGLE FIX PRO TRIMFIX EMU PROLINE KINGFIX EMU PROLINE	RAPID2+ PRO SML	KLIPOK EMU		SINGLE FIX PRO TRIMFIX EMU PROLINE KINGFIX EMU PROLINE	RAPID2+ PRO SML	KLIPOK EMU		SINGLE FIX PRO TRIMFIX EMU PROLINE KINGFIX EMU PROLINE
				ON-PURLIN	OFF-PURLIN			ON-PURLIN	OFF-PURLIN			ON-PURLIN	OFF-PURLIN	
TC2	0° to <7°	0 to 5m	1,398	1,372	716	1,014	1,193	1,129	589	835	1,023	968	505	715
		>5 to 10m	1,184	1,121	585	829	977	925	483	684	839	794	414	587
		>10 to 15m	1,068	1,011	527	747	882	835	436	617	*	*	*	530
		>15 to 20m	1,006	952	497	704	832	787	411	582	*	*	*	500
		>20 to 25m	962	908	467	660	788	743	382	543	*	*	*	470
TC2.5	7° to 15°	0 to 5m	1,239	1,173	612	867	1,001	947	494	700	843	798	416	590
		>5 to 10m	1,015	960	501	710	821	777	406	575	*	*	*	485
		>10 to 15m	916	867	452	641	*	*	*	519	*	*	*	438
		>15 to 20m	863	817	426	604	*	*	*	490	*	*	*	414
		>20 to 25m	819	773	396	564	*	*	*	450	*	*	*	374
TC3	0° to <7°	0 to 5m	1,468	1,468	789	1,118	1,313	1,243	649	919	1,125	1,064	555	787
		>5 to 10m	1,382	1,340	699	990	1,166	1,103	576	816	999	946	493	699
		>10 to 15m	1,264	1,196	624	884	1,042	986	515	729	894	846	442	625
		>15 to 20m	1,160	1,098	573	811	957	906	473	670	822	778	406	575
		>20 to 25m	1,116	1,054	543	770	913	862	443	630	778	736	377	545
TC3	7° to 15°	0 to 5m	1,356	1,291	674	954	1,101	1,042	543	770	926	877	458	648
		>5 to 10m	1,210	1,146	598	847	978	926	483	684	824	780	407	577
		>10 to 15m	1,082	1,024	534	757	875	829	432	612	*	*	*	517
		>15 to 20m	994	940	491	695	*	*	*	563	*	*	*	475
		>20 to 25m	950	896	461	655	*	*	*	523	*	*	*	435
TC3	0° to <7°	0 to 5m	1,545	1,545	874	1,238	1,400	1,376	718	1,017	1,243	1,176	614	870
		>5 to 10m	1,545	1,545	874	1,238	1,400	1,376	718	1,017	1,243	1,176	614	870
		>10 to 15m	1,432	1,432	751	1,064	1,251	1,184	618	875	1,072	1,014	529	750
		>15 to 20m	1,350	1,279	668	946	1,114	1,054	550	779	955	904	472	668
		>20 to 25m	1,427	1,427	745	1,056	1,216	1,151	601	851	1,023	968	505	716
TC3	7° to 15°	0 to 5m	1,427	1,427	745	1,056	1,216	1,151	601	851	1,023	968	505	716
		>5 to 10m	1,299	1,230	642	909	1,049	993	518	734	883	836	436	618
		>10 to 15m	1,299	1,230	642	909	1,049	993	518	734	883	836	436	618
		>15 to 20m	1,156	1,095	571	809	935	885	462	654	788	746	389	551
		>20 to 25m	1,112	1,051	541	769	891	841	432	614	744	702	360	521



GENERAL NOTES

- THESE DRAWINGS PROVIDE THE GENERAL SPAN TABLES FOR SCHLETTER FIX-Z PRO RAIL SYSTEM, WITH OTHER LIMITATIONS LISTED BELOW
- ALL SPANS ARE IN mm, HEIGHTS IN m, ROOF PITCH IN DEGREES
- COMPONENT CAPACITIES CALCULATED BASED ON THE SECTION PROPERTIES AND TEST REPORTS PROVIDED BY SCHLETTER
- DESIGNDEVISE (DD) HAVE NOT INDEPENDENTLY VERIFIED THE ACCURACY OF THESE PROPERTIES AND CAPACITIES
- BUILDING ROOF INCLUDING METAL SHEET, TOP-HATS/PURLINS, RAFTERS ETC. AND STRUCTURE TO BE CHECKED BY OTHERS FOR ADEQUACY AGAINST THE SOLAR PANEL AND ASSOCIATED WIND LOADS
- SOLAR PANELS STRUCTURAL CAPACITIES BY OTHERS
- ALL COMPONENTS TO BE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS
- SITE SPECIFIC CERTIFICATIONS BY OTHERS
- IT IS ASSUMED THE USERS OF THESE DRAWINGS HAVE SUFFICIENT ENGINEERING KNOWLEDGE TO INTERPRET AND APPLY THESE SPAN TABLES AND LIMITATIONS
- ROOF ZONING REQUIREMENTS MUST BE FOLLOWED AS DETAILED ON THIS DRAWING
- LINEAR INTERPOLATIONS FOR TABLE VALUES ARE ALLOWED

DESIGN CRITERIA

- WIND PARAMETERS IN ACCORDANCE WITH AS1170.2-2021:
 - IMPORTANCE LEVEL 2
 - WIND REGIONS A AND B ONLY
 - TERRAIN CATEGORIES 2, 2.5 AND 3 ONLY
 - Ms, Mt, Md, Mc FACTORS TAKEN AS 1.0
 - DESIGN LIFE 25-YEARS
 - ANNUAL PROBABILITY OF EXCEEDANCE FOR ULTIMATE WIND LOADS 200-YEARS
 - MEAN ROOF HEIGHT FROM ROAD LEVEL UP TO 20m
 - ANY BUILDING WIDTH (b) AND BUILDING DEPTH (d)
 - HIP AND GABLE ROOFS WITH PITCHES UP TO 15°
- A MINIMUM OF 12kg/m² IS CONSIDERED FOR THE SOLAR PANELS, RAILS AND FIXINGS SELF-WEIGHT AGAINST THE UPLIFT. NO OTHER DEAD LOADS CONSIDERED
- ULTIMATE LOAD COMBINATION OF 0.90 DEAD LOADS + 1.0 ULTIMATE WIND LOADS IS CONSIDERED
- WATER PONDING, SEISMIC, SNOW, HAIL LOADING AND CORROSION EXCLUDED. PERMANENT WORKS STRUCTURAL ENGINEER TO CONFIRM

SPAN TABLE MODIFICATION FACTORS

SPAN TABLES ARE BASED ON A PANEL SIZE OF 1,000mm x 2,000mm SUPPORTED ON A MINIMUM OF TWO RAILS WITH THREE OR MORE CONTINUOUS RAIL SPANS (MINIMUM 4 CONNECTION POINTS). FOR DIFFERENT PANEL SIZE, ADDITIONAL RAILS AND/OR SPANS LESS THAN THREE, VALUES READ FROM THE SPAN TABLES MUST BE MULTIPLIED BY THE 'f' FACTORS AS GIVEN BELOW (NOTE: MAX. SPACING MUST NOT EXCEED 1800mm BEFORE OR AFTER APPLICATION OF ANY MODIFICATION FACTOR)

A. SOLAR PANEL SIZE

PROVIDED AN ADDITIONAL CHECK IS PERFORMED SUCH THAT THE ULTIMATE LOAD AT EACH ELEVATION PART MUST NOT EXCEED 2.43kN

$$f = \sqrt{\frac{2000}{y}} \text{ FOR PANEL LENGTHS LESS THAN 2100}$$

$$f = \frac{2000}{y} \text{ FOR PANEL LENGTHS GREATER THAN 2100}$$

WHERE y IS SOLAR PANEL DIMENSION PERPENDICULAR TO RAILS.

B. ADDITIONAL ELEVATION UNITS WITH ADDITIONAL RAILS

f = 1.20 FOR 3 RAILS (6 ELEVATION UNITS PER PANEL)
f = 1.30 FOR 4 RAILS (8 ELEVATION UNITS PER PANEL)

C. LESS THAN THREE RAIL SPANS

f = 0.90

LEGEND

- CENTRAL ZONE (UNHATCHED)
- INTERMEDIATE ZONES SPACING = CENTRAL ZONE SPACING / 1.5
- EDGE/END ZONES SPACING = CENTRAL ZONE SPACING / 2.0
- CORNER ZONES SPACING = CENTRAL ZONE SPACING / 3.0
- PRINT IN COLOUR

CLIENT **SCHLETTER GROUP**
PROJECT **FIX-Z PRO SPAN TABLES**
231232 SPAN TABLES

THIS DESIGN AND DRAWING, IN ANY FORM, ARE THE EXCLUSIVE PROPERTY OF SCHLETTER AUSTRALIA AND SHALL NOT BE REPRODUCED IN WHOLE OR IN PART BY ANY MEANS WITHOUT THE WRITTEN CONSENT OF SCHLETTER AUSTRALIA. THIS DESIGN MAY NOT BE USED BY OR DISCLOSED TO ANY OTHER PERSON OR ORGANISATION FOR ANY PURPOSE WITHOUT THE WRITTEN CONSENT OF SCHLETTER AUSTRALIA.

DESIGNER - **AA**
APPROVED - **RW**
SCALE - **NTS - A3**

REV	DESCRIPTION	APPD	DATE
C2	ISSUED FOR CONSTRUCTION	RW	08.01.24
C1	ISSUED FOR CONSTRUCTION	RW	09.11.23

STATUS - **ISSUED FOR CONSTRUCTION**
DRAWING NUMBER & TITLE - **S01 - NOTES & ROOF ZONES**

Architecture and Engineering Consultants
DESIGN DEVISE PTY LTD
LEVEL 3, 480 COLLINS ST MELBOURNE 3000 VIC
ABN 40 651 752 260
vict@dd1.com.au
nsw@dd1.com.au
qld@dd1.com.au
wa@dd1.com.au