

Design Criteria for Span Tables:

Values in the maximum allowable rail span tables provided herein are subject to the following general criteria and additional criteria shown on individual span tables sheets. Values in span tables are based on the same engineering methodology and calculation algorithms used for U-Builder and are provided here for reference.

Building Assumptions

- Building Risk Category: II
- Mean Roof Height: 30 ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-22 Sec. 29.4.4
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, $k_{zt} = 1.0$
- $\gamma_E = 1.0$ for 'Interior' spans, $\gamma_E = 1.5$ for 'Exposed' spans (ASCE 7-22, Fig. 29.4-7)

Snow Design Assumptions

- Ground Snow Load = 0-100 psf
- Exposure Factor coefficients of Partially Exposed condition
- Thermal Factor = 1.0
- Results based on uniform snow load

Seismic Design Assumptions

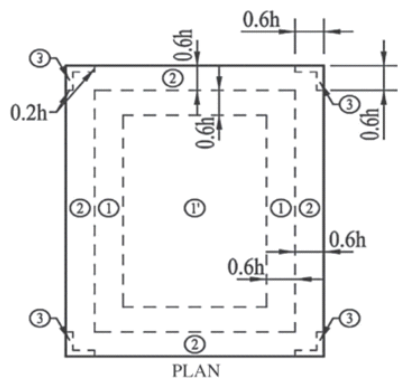
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 with $S_{ds} = 1, 2.4$ respectively per criteria shown on individual span tables sheets.
- $S_1 = 0.5$ & $S_{d1} = 0.6$
- Seismic site class D

Array Assumptions

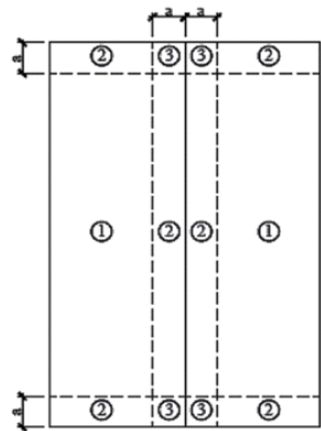
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at least twice the module height above roof surface.
- Modules are parallel to roof surface and maximum height above roof surface is 5" to 10" depending on attachment type.
- Gaps between module rows and columns is 0.25" in to 1" depending on clamp type.
- The most restrictive of all roof zone spans shall be used when any part of the module is attributed to that span.
- 'Exposed' spans as defined in ASCE 7-22 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.

Span Tables

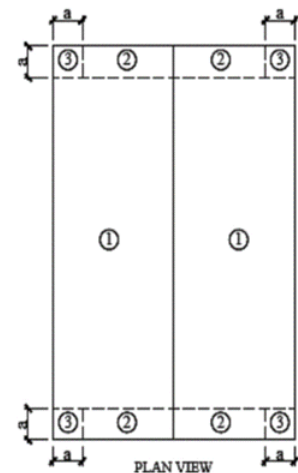
Zone should be considered as per ASCE 7-22, Fig. 30.3-2A to 30.3-2D



Gable Roofs $\theta \leq 7^\circ$

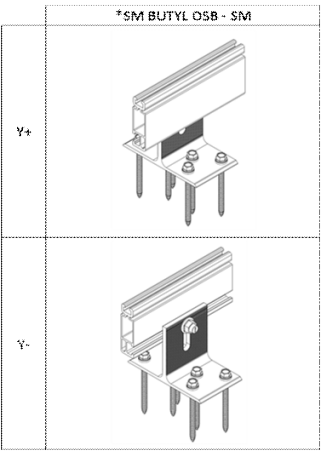


Gable Roofs $7^\circ < \theta \leq 27^\circ$



Gable Roofs $27^\circ < \theta \leq 45^\circ$

Rails can be installed in these possible orientations.



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[illegible]

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

[illegible]

[illegible]

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Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																									
				90			95			100			105			110			115			120			130			140			150			160			170			180					
				Roof Wind Zone																																									
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
30	B	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	44	64	55	39	64	48	34	59	43	30						
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	55	39	64	47	33	56	41	29	49	36	25	43	31	22	38	28
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	61	45	64	53	39	63	46	34	56	40	30	49	36	27		
			Exposed	64	64	64	64	64	64	64	64	64	64	60	64	64	54	64	64	49	64	60	44	64	55	41	64	47	34	55	40	29	47	34	25	41	30	22	36	26	30	32	23	26	
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	71	54	81	57	47	81	50	41	81	44	36	70	39	32		
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	65	81	81	59	81	66	54	81	60	49	81	50	42	81	43	36	64	37	31	56	33	27	49	29	24	43	25	21
	27-45	Interior	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	65	116*	91	56	116*	62	49	61	55	43	54	49	39				
		Exposed	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	116*	50	60	54	43	52	47	37	45	41	32	40	36	28	36	32	22	
	C	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	50	41	64	50	35	60	43	30	52	38	27	46	33	23	40	29	21
			Exposed	64	64	58	64	64	52	64	64	47	64	60	42	64	54	38	64	49	35	62	45	32	52	38	27	45	33	23	39	28	30	34	25	26	30	22	23	26	29	24			
		7-20	Interior	64	64	64	64	64	64	64	64	64	63	64	64	64	57	64	64	52	64	64	47	64	58	43	64	49	36	58	42	31	50	36	27	44	32	24	38	28	21	34	25	28	
			Exposed	64	64	51	64	62	46	64	56	41	64	50	37	63	46	34	57	42	31	52	38	28	44	32	24	38	27	31	33	24	27	28	21	23	25								

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[illegible]

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Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

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Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

[illegible]

Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

[illegible]



ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

23 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

SM
Rail Type

PRO SERIES
Clamp

SM BUTYL OSB
Attachment

SPAN TABLES

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

[illegible]

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Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																													
				90						95						100						105						110						115						120						130						140						150						160						170						180					
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0	B	0-7	Interior	67	67	67	67	67	67	67	67	58	67	67	49	67	67	41	67	61	36	67	53	32	67	41	27	52	33	23	42	29	20	35	25	18	30	22	15	27	19	14	14	14	14	14	14	14	14	14	14																														
			Exposed	67	67	41	67	58	35	67	49	31	67	42	28	60	36	25	51	33	23	45	30	21	35	25	18	30	22	15	26	19	13	22	16	11	20	14	15	17	13	14	14	14	14	14	14	14	14	14																															
		7-20	Interior	67	67	67	67	67	60	67	67	49	67	67	67	40	67	59	34	67	49	31	67	42	28	56	33	24	41	28	21	33	24	18	29	21	15	25	18	14	22	16	12	16	12	12	12	12	12	12	12																														
			Exposed	67	59	34	67	47	30	67	38	27	58	33	25	48	30	22	40	28	20	35	25	18	29	21	16	25	18	13	21	16	12	19	14	15	16	12	13	15	11	12	12	12	12	12	12	12	12																																
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	58	68	68	48	68	58	40	68	48	35	68	35	29	67	30	25	52	26	21	42	23	19	34	20	16	30	18	15	15	15	15	15	15	15	15																																
			Exposed	68	68	47	68	55	38	68	44	33	68	37	30	68	33	27	66	30	25	56	27	22	42	23	19	34	20	16	29	17	14	25	15	12	22	13	11	20	11	14	12	12	12	12	12	12	12																																
	27-45	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69																																
		Exposed	69	69	64	69	69	52	69	63	43	69	53	36	58	45	32	48	38	29	40	34	27	32	29	23	28	25	19	24	21	17	21	19	15	18	16	13	16	14	11	15	12	12	12	12	12	12																																	
	C	0-7	Interior	67	67	45	67	64	37	67	54	33	67	46	30	65	39	27	56	35	24	49	32	22	38	27	19	31	23	16	27	20	14	24	17	12	21	15	11	18	13	14	14	14	14	14	14	14	14	14																															
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		20-27	Interior	68	68	53	68	62	42	68	50	35	68	41	32	68	35	29	68	32	26	62	29	24	46	24	20	36	21	17	31	18	15	27	16	13	24	14	11	21	12	15	12	15	12	15	12	15	12	15																															
			Exposed	68	35	28	68	31	25	57	28	23	48	25	20	41	22	19	35	20	17	32	19	15	27	16	13	23	13	11	20	12	15	17	10	13	15	14	11	14	12	14	12	14	12	14	12	14																																	
	27-45	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69																																
		Exposed	65	49	34	51	40	30	41	35	27	35	31	25	32	28	22	29	26	20	26	23	19	24	21	17	22	20	15	18	17	13	16	14	11	14	12	15	12	11	13	10	14	11	14	13	10																																		
	D	0-7	Interior	67	57	34	67	48	30	67	40	27	57	35	25	49	32	22	42	29	20	37	26	18	31	22	16	26	19	13	23	16	11	20	14	15	17	12	13	15	11	11	12	13	14	15	11	12																																	
			Exposed	48	32	22	41	28	20	35	25	18	31	23	16	28	20	14	26	19	13	24	17	12	20	14	15	17	12	13	15	11	11	13	14	10	11	12	9	15	11	14	11	8	10	9	7																																		
7-20		Interior	67	46	30	67	37	27	55	33	24	45	29	22	38	27	20	33	24	18	30	22	16	26	19	14	22	16	12	19	14	15	16	12	13	14	11	12	13	14	15	11	12	13	14	15	11	13																																	
		Exposed	37	26	19	33	24	17	29	21	16	26	19	14	24	17	13	22	16	12	20	14	11	17	12	14	10	12	12	14	10	12	14	10	12	9	14	10	8	13	9	7	10	9	7																																				
20-27		Interior	68	53	37	68	43	32	68	35	29	68	32	26	62	29	24	52	26	22	45	24	20	35	20	17	30	17	14	26	15	12	22	13	11	20	11	14	17	15	13	14	15	11	14	15	13																																		
		Exposed	61	29	24	50	26	21	42	23	19	36	21	17	32	19	15	29	17	14	27	16	13	23	13	11	19	11	14	17	15	12	15	13	11	9	11	14	11	14	15	11	14	15	13																																				
27-45	Interior	69	69	51	69	61	41	68	51	35	54	43	31	45	36	28	38	33	26	34	30	24	28	25	20	24	22	17	21	19	15	18	16	13	16	14	11	14	13	15	11	14	13	15	11	15																																			
	Exposed	45	36	28	36	32	25	32	29	23	29	26	20	26	23	19	24	21	17	22	20	15	18	17	13	16	14	11	14	12	15	12	11	13	10	14	11	14	13	14	13	10	14	13	10																																				
10	B	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	53	32	54	41	27	52	33	23	42	29	20	35	25	18	30	22	15	27	19	14	14	14	14	14	14	14	14	14																																
			Exposed	54	54	41	54	54	35	54	49	31	54	42	28	54	36	25	51	33	23	45	30	21	35	25	18	30	22	15	26	19	13	22	16	11	20	14	15	17	13	14	14	14	14	14	14	14																																	
		7-20	Interior	55	55	55	55	55	55	55	55	49	55	55	40	55	55	34	55	49	31	55	42	28	55	33	24	41	28	21	33	24	18	29	21	15	25	18	14	22	16	12	16	12	12	12	12	12	12																																
			Exposed	55	55	34	55	47	30	55	38	27	55	33	25	48	30	22	40	28	20	35	25	18	29	21	16	25	18	13	21	16	12	19	14	15	16	12	13	15	11	11	12	13	14	15	11	12																																	
		20-27	Interior	62	62	62	62	62	62	62	62	62	62	58	62	62	48	62	58	40	62	48	35	62	35	29	62	30	25	52	26	21	42	23	19	34	20	16	30	18	15	15	15	15	15	15	15	15	15																																
			Exposed	62	62	47	62	55	38	62	44	33	62	37	30	62	33	27	62	30	25	56	27	22	42	23	19	34	20	16	29	17	14	25	15	12	22	13	11	20	11	14	12	12	12	12	12																																		
	27-45	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67																																	
		Exposed	67	67	64	67	67	52	67	63	43	67	53	36	58	45	32	48	38	29	40	34	27	32	29	23	28	25	19	24	21	17	21	19	15	18	16	13	16	14	11	15	12	12	12	12	12																																		
	C	0-7	Interior	54	54	45	54	54	37	54	54	33	54	46	30	54	39	27	54	35	24	49	32	22	38	27	19	31	23	16	27	20	14	24	17	12	21	15	11	18	13	14	14	14	14	14	14	14																																	
			Exposed	54	39	27	54	34	24	45	30	21	39	27	19	34	25	17	31	22	16	28	21	14	24	17	12	20	15	10	18	13	14	15	11	12	13	15	11	12	13	9	11	13	14	15	11	13																																	
		7-20	Interior	55	55	37	55	52	32	55	43	29	55	35	26	53	32	24	44	29	21	38	27	20	31	22	17	26	19	14	23	17	12	20	14	11	17	13	14	15	11	11	13	14	15	11	13																																		
			Exposed	53	32	23	42	28	21	35	25	19	32	23	17	29	21																																																																

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

40 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																													
				90						95						100						105						110						115						120						130						140						150						160						170						180					
				Roof Wind Zone																																																																													
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																				
0	B	0-7	Interior	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129																																	
			Exposed	129	129	129	129	129	77	129	129	61	129	117	55	129	83	50	129	65	46	129	59	42	75	50	35	59	43	30	51	37	26	44	32	23	39	28	20	34	25	27	27	27	27	27	27	27	27																																
		7-20	Interior	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129																																
			Exposed	129	129	129	129	129	60	129	129	54	129	71	49	129	60	44	129	54	40	129	50	37	58	42	31	49	36	27	43	31	23	37	27	20	33	24	27	29	21	24	24	24	24	24	24	24	24																																
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131																																
			Exposed	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131																																
	C	0-7	Interior	129	129	129	129	129	101	129	129	65	129	129	58	129	99	53	129	74	48	129	63	44	90	53	37	62	45	32	54	39	27	47	34	24	41	30	21	36	27	19	19	19	19	19	19	19	19																																
			Exposed	129	97	53	129	69	47	129	60	42	97	54	38	71	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	27	30	22	24	27	20	21	24	26	26	26	26	26	26	26	26																																	
		7-20	Interior	129	129	129	129	129	64	129	129	57	129	129	51	129	63	47	129	58	42	129	53	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	25	25	25	25	25	25	25	25																																
			Exposed	129	63	46	129	56	41	129	50	37	62	45	34	57	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	24	26	19	21	23	25	19	20	22	16	16	16	16	16	16	16																																	
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131																																
			Exposed	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131																																
	D	0-7	Interior	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133																																
			Exposed	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133																														
		7-20	Interior	129	129	73	129	129	60	129	105	54	129	76	49	129	63	44	120	57	40	85	52	37	60	44	31	52	37	26	45	32	23	39	28	20	34	25	27	30	22	24	24	24	24	24	24	24	24																																
			Exposed	129	62	44	108	55	39	75	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	24	26	29	21	23	25	28	20	22	25	17	20	22	16	16	16	16	16	16	16																																	
		20-27	Interior	129	129	59	129	129	53	129	64	47	129	58	43	129	53	39	70	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	27	29	21	24	26	19	21	24	26	19	21	24	26	19	21																															
			Exposed	129	52	39	64	47	34	58	42	31	52	38	28	47	34	25	43	31	23	39	29	21	33	24	27	28	21	23	24	27	20	21	24	18	19	21	16	25	19	14	14	14	14	14	14	14																																	
10	B	0-7	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105																																	
			Exposed	105	105	105	105	105	77	105	105	61	105	105	55	105	83	50	105	65	46	105	59	42	75	50	35	59	43	30	51	37	26	44	32	23	39	28	20	34	25	27	27	27	27	27	27	27	27																																
		7-20	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106																															
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106																															
		20-27	Interior	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120																															
			Exposed	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120																															
	C	0-7	Interior	105	105	105	105	101	105	105	65	105	105	58	105	99	53	105	74	48	105	63	44	90	53	37	62	45	32	54	39	27	47	34	24	41	30	21	36	27	19	19	19	19	19	19	19	19																																	
D	0-7	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105																																	
		Exposed	105	97	53	105	69	47	105	60	42	97	54	38	71	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	27	30	22	24	27	20	21	24	26	26	26	26	26	26	26	26																																		
	7-20	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106																																
		Exposed	106	52	39	64	47	34	58	42	31	52	38	28	47	34	25	43	31	23	39	29	21	33	24	27	28	21	23	24	27	20	21	24	18	19	21	16	25	19	14	14	14	14	14	14	14																																		
	20-27	Interior	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123																																	
		Exposed	123	57	47	123	50	42	123	45	37	88	41	34	64	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	24	29	26	21	25	23	19	23	19	23	20	17	17	17	17	17																																		
20	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78																																	
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78</																																																								

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				Roof Wind Zone																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3			
90	B	0-7	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27				
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27			
		Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27			
		Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	44		
		Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*		
		Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27		
	Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27			
	Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	44			
	Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*			
	Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	24				
	Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	24				
	Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	24			
Exposed	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*	75*				
Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26					
Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24				
Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44				
Exposed	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*				
Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24					
Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24				
Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44				
Exposed	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*				
Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27				

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																							
				90			95			100			105			110			115			120			130			140			150			160			170			180			
				Roof Wind Zone																																							
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			Exposed	80	80	49	80	70	42	80	59	37	80	50	33	71	44	30	61	39	28	53	36	25	42	30	21	36	26	18	31	22	16	27	19	14	24	17	12	21	15	11	
		7-20	Interior	80	80	80	80	72	80	58	80	80	48	80	71	41	80	59	37	42	80	50	34	67	39	29	49	33	25	40	29	21	35	25	19	30	22	16	27	20	14		
			Exposed	80	70	41	80	56	36	80	46	33	70	40	29	57	36	27	48	33	24	80	30	22	35	25	19	30	22	16	26	19	14	22	16	12	20	14	11	18	13	14	
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	69	48	81	58	41	81	42	35	81	36	30	62	31	26	50	27	22	41	24	20	36	21	17		
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	C	27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82		
			Exposed	82	82	77	82	82	62	82	76	51	82	63	43	69	54	39	57	46	35	48	41	32	39	34	27	33	29	23	28	26	20	25	22	18	22	20	16	19	17	14	
		0-7	Interior	80	80	54	80	76	45	80	64	39	80	55	35	78	47	32	67	42	29	58	38	27	45	32	22	38	27	19	33	24	17	28	21	14	25	18	13	22	16	11	
			Exposed	78	47	32	64	41	28	54	36	26	47	33	23	41	30	21	37	27	19	34	25	17	29	21	15	24	18	13	21	15	11	18	13	14	16	12	13	14	16	11	
		D	7-20	Interior	80	79	44	80	62	39	80	51	35	79	42	31	64	38	28	53	35	26	45	32	23	37	27	20	32	23	17	27	20	15	24	17	13	21	15	11	19	13	15
				Exposed	63	38	28	51	34	25	42	31	22	38	27	20	34	25	18	31	23	17	28	21	15	24	17	13	21	15	11	18	13	15	15	11	13	14	15	11	12	13	14
20-27	Interior		81	81	63	81	74	51	81	59	42	81	49	38	81	42	34	81	38	31	74	34	28	55	29	2																	

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

[illegible]

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

[illegible]

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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* Cells with an asterisks indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

10 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

[illegible]

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Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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* Cells with an astrisks indicates that the L-foot must be oriented in the Y- direction as indicated in the image.
 10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.
 40 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

* Cells with an asterisk indicates that the L-root must be oriented in the Y- direction as indicated in the image.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

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[illegible]

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

[illegible]

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

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