

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

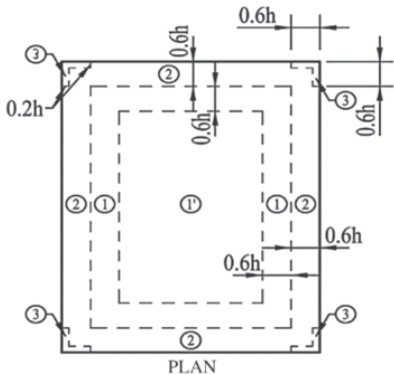
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 with $S_{ds} = 1, 2.4$ respectively per criteria shown on individual span tables sheets.
- $S_1 = 0.5$ & $S_{d1} = 0.6$
- Seismic site class D

Array Assumptions

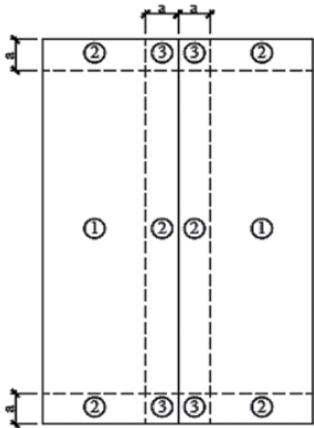
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at 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

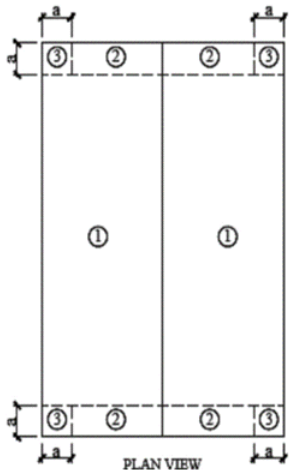
Zone should be considered as per ASCE 7-22, Fig. 30.3-2A to 30.3-2D



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

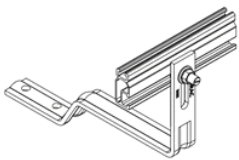


Gable Roofs $7^\circ < \theta \leq 27^\circ$



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

Rails can be installed in these possible orientations.

*AT1	
Y+	Alternate orientation not allowed
Y-	

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	
0	B	0-7	Interior	83	83	83	83	83	83	83	83	83	80	83	83	77	83	83	73	83	81	66	83	78	57	83	72	44	78	58	37	73	47	32	61	40	28	51	35	25	43	31	22
			Exposed	83	83	73	83	80	64	83	76	53	83	73	46	80	65	40	77	57	37	75	50	34	62	40	28	50	34	24	41	30	21	36	26	28	31	23	24	28	20	22	
		7-20	Interior	83	83	83	83	83	81	83	83	77	83	83	74	83	81	67	83	77	56	83	75	48	80	60	38	75	46	33	62	38	28	49	33	25	40	29	22	36	26	29	
			Exposed	83	80	66	83	77	53	83	73	44	80	63	39	77	53	36	74	45	32	68	40	30	50	34	25	40	29	21	34	25	28	30	22	24	26	29	22	23	26	19	
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	77	84	80	74	84	77	68	84	71	50	83	53	40	78	42	34	73	36	30	63	32	26	52	28	23
			Exposed	84	84	77	84	80	73	84	76	63	84	72	52	84	61	43	82	52	39	79	44	36	74	37	30	61	31	26	49	27	22	40	24	30	36	21	26	32	28	23	
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	84	84	79	84	83	78	67	78	72	51	72	58	41	59	47	36	46	40	32	40	35	28			
			Exposed	84	84	82	84	84	78	84	82	75	84	78	70	80	75	59	77	71	50	75	63	43	60	48	36	45	39	31	38	34	27	33	30	24	29	26	21	26	23	28	
	C	0-7	Interior	83	83	75	83	82	70	83	78	58	83	75	50	82	71	43	79	62	39	76	54	35	68	42	30	54	36	26	44	31	22	38	27	29	33	24	26	29	21	23	
			Exposed	82	71	42	78	60	38	75	51	34	70	44	31	61	39	28	53	36	25	46	33	23	38	28	30	33	24	25	28	20	22	25	27	19	22	24	17	29	21	15	
		7-20	Interior	83	82	71	83	79	59	83	75	49	82	70	41	79	58	38	76	49	34	72	42	31	55	36	26	42	31	23	36	26	30	32	23	26	28	20	23	25	27	20	
			Exposed	79	58	37	75	47	33	70	41	30	57	37	27	48	33	25	41	30	22	38	28	20	32	23	26	27	20	22	24	26	19	21	23	17	28	20	15	24	18	19	
		20-27	Interior	84	84	79	84	81	75	84	78	70	84	74	57	84	68	48	84	57	41	81	49	38	76	39	32	67	33	27	53	29	24	43	25	21	38	22	28	33	30	24	
			Exposed	84	68	47	83	55	40	80	45	36	77	40	33	73	36	30	66	33	27	57	30	25	44	25	21	37	22	27	32	28	23	28	25	20	25	22	18	22	19	16	
		27-45	Interior	84	84	84	84	80	84	83	77	84	80	73	82	77	65	79	74	55	76	69	47	67	52	38	50	41	33	40	36	28	35	31	25	31	28	22	27	25	29		
			Exposed	82	77	64	78	73	53	75	64	44	70	54	39	58	46	36	48	41	32	42	37	30	35	32	25	30	27	22	26	24	28	23	21	25	20	27	22	27	24	19	
	D	0-7	Interior	83	79	62	83	76	52	83	72	44	79	63	39	76	54	35	73	47	32	66	42	29	52	35	25	42	30	21	36	26	28	31	23	24	28	20	22	24	27	19	
			Exposed	76	54	35	72	46	31	62	40	28	53	36	25	46	33	23	41	30	21	37	27	29	32	23	25	27	30	21	23	26	18	20	23	16	27	20	14	24	18	13	
		7-20	Interior	83	76	52	83	72	43	80	60	38	76	50	34	72	42	31	63	39	28	53	35	26	41	30	22	35	25	28	30	22	25	26	29	22	23	26	19	21	23	17	
			Exposed	72	42	31	60	38	28	49	34	25	42	30	22	38	28	20	34	25	28	32	23	26	27	29	22	23	25	19	30	22	16	26	19	14	23	17	12	20	16	11	
		20-27	Interior	84	79	72	84	75	60	84	70	49	84	58	42	81	48	38	78	42	34	75	38	31	64	32	27	50	28	23	41	24	30	36	21	26	31	28	23	28	25	20	
			Exposed	81	48	38	77	41	34	74	36	30	67	33	27	57	30	25	49	27	22	43	25	21	36	21	26	31	27	23	27	24	20	23	21	17	20	18	16	28	16	13	
		27-45	Interior	84	84	78	84	81	74	83	77	67	79	74	56	76	69	47	73	59	41	65	51	38	47	40	32	39	35	27	33	30	24	29	26	21	26	23	28	23	20	25	
			Exposed	76	68	47	71	57	40	59	48	36	49	41	33	42	37	30	38	34	27	35	31	25	29	26	21	25	23	27	22	30	24	29	26	21	26	23	18	23	20	16	
10	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	57	71	71	66	71	71	44	71	58	37	71	47	32	61	40	28	51	35	25	43	31	22
			Exposed	71	71	71	71	71	64	71	71	53	71	71	46	71	65	40	71	57	37	71	50	34	62	40	28	50	34	24	41	30	21	36	26	28	31	23	24	28	20	22	
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	60	38	72	46	33	62	38	28	49	33	25	40	29	22	36	26	29
			Exposed	72	72	66	72	72	53	72	72	44	72	63	39	72	53	36	72	45	32	68	40	30	50	34	25	40	29	21	34	25	28	30	22	24	26	29	22	23	26	19	
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	74	81	77	68	81	71	50	81	53	40	78	42	34	73	36	30	63	32	26	52	28	23	
			Exposed	81	81	77	81	80	73	81	76	63	81	72	52	81	61	43	81	52	39	79	44	36	74	37	30	61	31	26	49	27	22	40	24	30	36	21	26	32	28	23	
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	79	83	83	76	83	78	67	78	72	51	72	58	41	59	47	36	46	40	32	40	35	28
			Exposed	83	83	82	83	83	78	83	82	75	83	78	70	80	75	59	77	71	50	75	63	43	60	48	36	45	39	31	38	34	27	33	30	24	29	26	21	26	23	28	
	C	0-7	Interior	71	71	71	71	71	70	71	71	58	71	71	50	71	71	43	71	62	39	71	54	35	68	42	30	54	36	26	44	31	22	38	27	29	33	24	26	29	21	23	
			Exposed	71	71	42	71																																				

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[illegible]

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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.

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[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 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.

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

[illegible]

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

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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

SML
Rail Type

PRO SERIES
Clamp

Solarhooks AT1
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)																																																																													
				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																																				
60	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46																																		
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46																																		
		7-20	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	78																																
			Exposed	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																																		
		20-27	Interior	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	68	68	68	68	68	68	68																																	
			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	68	68	68	68	68	68																																		
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46																																	
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46																																		
		7-20	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	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78																																		
		20-27	Interior	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	68	68	68	68	68	68	68																																	
			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	68	68	68	68	68	68																																		
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51																																	
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51																																		
		7-20	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52																																	
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52																																		
		20-27	Interior	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	75	75	75	75	75	75	75	75																																
			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	75	75	75	75	75	75	75																																	
E	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71																																
		Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71																																		
	7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51																																	
		Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52																																		
	20-27	Interior	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	75	75	75	75	75	75	75	75																																	
		Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71																																		
70	B	0-7	Interior	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	40	40	40	40	40	40	40	40																																	
			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	40	40	40	40	40	40	40	40																																	
		7-20	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	67																															
			Exposed	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																																		
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59																																	
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59																																		
	C	0-7	Interior	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	40	40	40	40	40	40	40	40																																	
			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	40	40	40	40	40	40	40	40																																	
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67																																																												

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* 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-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)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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30	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42

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[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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				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	1	2	3	1	2	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
0	B	0-7	Interior	98	98	98	98	98	98	98	98	98	94	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98

[illegible]

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.

* 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)																																																																													
				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	74	74	74	74	74	74	74	74	74	74	74	69	74	74	58	74	74	49	74	71	43	74	55	34	71	44	29	57	35	25	46	31	22	38	27	19	33	24	17	18	17	17	17	17	17																																	
			Exposed	74	74	57	74	74	47	74	68	40	74	57	34	74	49	31	71	43	28	61	37	26	47	31	22	37	27	19	32	23	16	28	20	21	24	18	19	21	16	17	17	17	17	17	17																																		
		7-20	Interior	74	74	74	74	74	74	74	74	71	74	74	59	74	49	74	72	41	74	61	35	74	44	30	61	34	25	46	30	22	36	26	19	31	23	17	28	20	23	23	23	23	23	23	23																																		
			Exposed	74	74	48	74	70	39	74	56	34	74	46	30	71	39	27	59	34	25	50	31	23	36	26	19	31	22	17	27	19	22	23	17	19	20	23	17	18	20	15	15	15	15	15	15																																		
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	75	60	75	72	50	75	52	36	75	39	31	72	32	26	59	28	23	47	25	20	39	22	18	18	18	18	18	18																																		
			Exposed	75	75	71	75	75	57	75	67	46	75	54	38	75	45	33	75	38	30	74	34	28	60	28	23	46	24	20	36	21	17	31	18	23	28	16	20	24	22	18	22	18	22	18	22																																		
	C	0-7	Interior	74	74	63	74	74	52	74	72	44	74	63	37	74	54	33	73	47	30	67	41	27	51	33	23	40	28	20	33	24	17	29	21	23	26	19	20	23	17	18	18	18	18	18																																			
			Exposed	74	74	53	74	73	45	29	63	38	26	53	34	24	46	30	21	40	28	20	35	25	18	29	21	23	25	18	20	22	16	17	19	21	15	17	19	14	16	12	12	12	12	12																																			
		7-20	Interior	74	74	54	74	73	43	74	63	36	74	51	32	74	43	29	67	36	26	56	33	24	40	28	20	32	24	17	28	20	23	24	18	20	22	16	18	19	21	16	18	19	21	16	18																																		
			Exposed	74	42	29	63	35	26	51	31	23	42	28	21	35	26	19	32	23	17	29	21	16	25	18	20	21	15	17	18	20	15	16	18	19	16	19	17	14	17	14	10	10	10																																				
		20-27	Interior	75	75	74	75	75	64	75	72	51	75	61	42	75	50	35	75	42	32	75	35	29	66	30	25	50	26	21	40	22	18	33	19	16	29	17	21	26	23	19	19	19	19	19	19																																		
			Exposed	75	49	35	75	40	31	75	34	28	69	31	25	58	28	23	49	25	21	42	23	19	33	20	16	29	17	21	25	22	18	22	19	16	19	17	14	17	14	12	12	12	12	12																																			
	D	0-7	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76																																		
			Exposed	76	76	76	76	76	76	73	76	76	63	76	73	52	76	64	43	72	54	37	61	47	33	44	36	28	34	30	24	29	26	21	26	23	18	23	20	16	20	18	20	18	22	18	22																																		
		7-20	Interior	74	74	63	74	74	52	74	72	44	74	63	37	74	54	33	73	47	30	67	41	27	51	33	23	40	28	20	33	24	17	29	21	23	26	19	20	23	17	18	18	18	18	18	18																																		
			Exposed	74	74	54	74	73	43	74	63	36	74	51	32	74	43	29	67	36	26	56	33	24	40	28	20	32	24	17	28	20	23	24	18	20	22	16	18	19	21	16	18	19	21	16	18																																		
		20-27	Interior	74	42	29	63	35	26	51	31	23	42	28	21	35	26	19	32	23	17	29	21	16	25	18	20	21	15	17	18	20	15	16	18	19	16	19	17	14	17	14	10	10	10	10	10																																		
			Exposed	75	75	74	75	75	64	75	72	51	75	61	42	75	50	35	75	42	32	75	35	29	66	30	25	50	26	21	40	22	18	33	19	16	29	17	21	26	23	19	19	19	19	19																																			
E	0-7	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76																																			
		Exposed	76	76	76	76	76	76	73	76	76	63	76	73	52	76	64	43	72	54	37	61	47	33	44	36	28	34	30	24	29	26	21	26	23	18	23	20	16	20	18	20	18	22	18	22																																			
	7-20	Interior	74	74	63	74	74	52	74	72	44	74	63	37	74	54	33	73	47	30	67	41	27	51	33	23	40	28	20	33	24	17	29	21	23	26	19	20	23	17	18	18	18	18	18	18																																			
		Exposed	74	74	54	74	73	43	74	63	36	74	51	32	74	43	29	67	36	26	56	33	24	40	28	20	32	24	17	28	20	23	24	18	20	22	16	18	19	21	16	18	19	21	16	18																																			
	20-27	Interior	74	42	29	63	35	26	51	31	23	42	28	21	35	26	19	32	23	17	29	21	16	25	18	20	21	15	17	18	20	15	16	18	19	16	19	17	14	17	14	10	10	10	10	10																																			
		Exposed	75	75	74	75	75	64	75	72	51	75	61	42	75	50	35	75	42	32	75	35	29	66	30	25	50	26	21	40	22	18	33	19	16	29	17	21	26	23	19	19	19	19	19																																				
10	B	0-7	Interior	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	60	60	60	60	60	60																																			
			Exposed	60	60	57	60	60	47	60	60	40	60	57	34	60	49	31	60	43	28	60	37	26	47	31	22	37	27	19	32	23	16	28	20	21	24	18	19	21	16	17	17	17	17	17																																			
		7-20	Interior	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	60	60	60	60	60	60	60	60																																	
			Exposed	60	60	48	60	60	39	60	56	34	60	46	30	60	39	27	59	34	25	50	31	23	36	26	19	31	22	17	27	19	22	23	17	19	20	23	17	18	20	15	15	15	15	15	15																																		
		20-27	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																																	
			Exposed	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																																	
	C	0-7	Interior	60	60	60	60	60	52	60	60	44	60	60	37	60	54	33	60	47	30	60	41	27	51	33	23	40	28	20	33	24	17	29	21	23	26	19	20	23	17	18	18	18	18	18	18																																		
			Exposed	60	60	53	60	60	45	29	60	38	26	53	34	24	46	30	21	40	28	20	35	25	18	29	21	23	25	18	20	22	16	17	19	21	15	17	19	14	16	12	12	12	12	12																																			
		7-20	Interior	60	60	54	60	60	43	60	60	36	60	51	32	60	43	29	60	36	26	56	33	24	40	28	20	32	24	17	28	20	23	24	18	20	22	16	18	19	21	16	18	19	21	16	18																																		
			Exposed	60	42	29	60	40	35	26	51	31	23	42	28	21	35	26	19	32	23	17	29	21	16	25	18	20	21	15	17	18	20	15	16	18	19	16	19	17	14	17	14	10	10	10																																			
		20-27	Interior	69	69	69	69	69	64	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	49	35	69	40	31	69	34	28	69	31	25	58	28	23	49	25	21	42	23	19	33	20	16	29	17	21	25	22	18	22	19	16	19	17	14	17	14	12	12	12	12	12																																			
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	7																																																				

[illegible]

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.



II

30 ft

S_s = 1.25

23 sq.ft
Module Area

ORIENTATION

CROSS-SLOPE
Rail Direction

SML
Rail Type

UAF
Clamp

Solarhooks AT1

SPAN TABLES

[illegible]

* Cells with an astrisks 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)																																																																													
				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	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98																																
			Exposed	98	98	85	98	93	80	98	89	76	98	84	71	94	81	61	90	78	56	86	75	51	80	61	43	74	52	37	62	45	32	54	40	28	48	35	37	42	31	33	33	33	33	33	33	33	33	33	33	33																													
		7-20	Interior	98	98	98	98	98	96	98	98	90	98	98	85	98	95	81	98	90	77	98	86	74	94	79	58	86	72	50	80	59	43	75	51	38	62	45	33	55	40	30	40	30	40	30	40	30	40	30	40	30	40																												
			Exposed	98	95	81	98	89	77	98	84	71	95	80	60	90	76	54	85	71	49	82	61	45	75	52	38	61	44	33	52	38	28	46	33	37	40	29	33	36	40	29	33	36	40	29	33	36	40	29	33																														
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	95	98	98	90	98	95	86	98	90	82	98	83	75	98	76	60	91	63	52	85	55	46	80	49	40	76	43	36	43	36	43	36	43	36	43	36																														
			Exposed	98	98	90	98	93	84	98	88	80	98	83	76	98	68	97	76	60	93	71	55	85	56	46	79	48	40	74	41	34	62	36	30	54	32	40	48	28	35	35	35	35	35	35	35	35	35	35																															
	C	0-7	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99																														
			Exposed	99	99	87	99	99	91	99	96	86	99	91	82	95	87	78	90	83	75	86	80	66	79	73	55	72	60	47	58	52	41	51	45	36	45	40	32	40	32	40	32	40	32	40	32	40	32	40																															
		7-20	Interior	98	98	87	98	96	82	98	91	78	98	87	75	98	82	63	93	78	57	88	75	52	84	65	48	77	55	40	64	47	35	55	40	30	48	35	40	31	35	38	28	31	35	38	28	31	35	38	28	31																													
			Exposed	92	78	57	87	73	51	82	62	46	78	56	41	74	51	37	63	46	34	58	42	31	49	36	40	42	31	34	36	40	30	32	35	26	28	31	29	37	27	29	37	27	29	37	27	29																																	
		20-27	Interior	98	98	93	98	96	87	98	91	82	98	86	78	98	83	63	95	75	58	88	59	49	81	51	42	76	44	36	65	38	32	57	34	28	51	30	37	37	37	37	37	37	37	37	37	37	37	37																															
			Exposed	98	98	82	94	98	77	98	72	62	93	72	55	89	60	50	85	55	45	81	50	41	78	46	38	68	39	32	56	33	27	49	29	36	43	38	31	38	33	28	33	28	33	28	33	28	33																																
D	0-7	Interior	99	99	99	99	99	94	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99																																
		Exposed	98	89	80	92	84	76	87	80	71	82	77	60	78	72	54	75	62	50	64	57	45	54	48	38	46	42	33	40	36	29	35	31	28	33	28	33	28	33	28	33	28	33	28	33	28	33																																	
	7-20	Interior	98	92	80	98	88	76	97	83	68	92	80	60	88	76	54	85	72	49	81	64	45	75	54	38	63	46	33	55	40	28	48	35	37	42	31	33	37	41	31	33	37	41	31	33	37	41	31																																
		Exposed	88	76	54	84	71	48	80	61	43	76	55	39	72	50	35	63	46	32	57	42	30	48	35	38	41	30	32	36	39	28	31	35	25	42	30	22	37	27	29	37	27	29	37	27	29																																		
	20-27	Interior	98	98	87	98	96	83	65	93	79	58	88	75	53	84	65	48	80	59	43	77	54	40	62	45	34	53	39	29	46	34	38	40	29	33	36	39	29	32	35	26	29	32	35	26	29	32	35																																
		Exposed	84	64	47	79	57	42	75	51	38	64	46	34	58	42	31	53	38	29	48	35	39	41	30	33	35	39	29	46	34	38	40	29	33	36	39	29	32	35	26	29	32	35	26	29	32	35																																	
10	B	0-7	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91																															
			Exposed	91	91	85	91	91	80	91	89	76	91	84	71	91	81	61	90	78	56	86	75	51	80	61	43	74	52	37	62	45	32	54	40	28	48	35	37	42	31	33	33	33	33	33	33	33	33	33	33																														
		7-20	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91																													
			Exposed	91	91	81	91	89	77	91	84	71	91	80	60	90	76	54	85	71	49	82	61	45	75	52	38	61	44	33	52	38	28	46	33	37	40	29	33	36	40	29	33	36	40	29	33	36	40	29	33																														
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95																													
			Exposed	95	95	90	95	93	84	95	88	80	95	83	76	95	79	68	95	76	60	93	71	55	85	56	46	79	48	40	74	41	34	62	36	30	54	32	40	48	28	35	35	35	35	35	35	35	35	35																															
20	C	0-7	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98																														
			Exposed	98	98	97	98	98	91	98	96	86	98	91	82	95	87	78	90	83	75	86	80	66	79	73	55	72	60	47	58	52	41	51	45	36	45	40	32	40	32	40	32	40	32	40	32	40	32	40																															
		7-20	Interior	91	91	87	91	91	82	91	78	91	87	75	91	82	63	91	78	57	88	75	52	84	65	48	77	55	40	64	47	35	55	40	30	48	35	40	31	35	38	28	31	35	38	28	31	35	38	28	31																														
			Exposed	91	78	57	87	73	51	82	62	46	78	56	41	74	51	37	63	46	34	58	42	31	49	36	40	42	31	34	36	40	30	32	35	26	28	31	29	37	27	29	37	27	29	37	27	29																																	
		20-27	Interior	95	95	93	95	95	87	95	91	82	95	86	78	95	82	74	95	78	63	95	75	58	88	59	49	81	51	42	76	44	36	65	38	32	57	34	28	51	30	37	37	37	37	37	37	37	37	37	37																														
			Exposed	95	95	82	94	95	77	95	72	62	93	72	55	89	60	50	85	55	45	81	50	41	78	46	38	68	39	32	56	33	27	49	29	36	43	38	31	38	33	28	33	28	33	28	33	28	33																																
20	D	0-7	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91																														
			Exposed	88	76	54	84	71	48	80	61	43	76	55	39	72	50	35	63	46	32	57	42	30	48	35	38	41	30	32	36	39	28	31	35	25	42	30	22	37	27	29	37	27	29	37	27	29																																	
		7-20	Interior	91	88	76	91	83	65	91	79	58	88	75	53	84	65	48	80	59	43	77	54	40	62	45	34	53	39	29	46	34	38	40	29	33	36	39	29	32	35	26	29	32	35	26	29	32	35																																
			Exposed	84	64	47	79	57	42	75	51	38	64	46	34	58	42	31	53	38	29	48	35	39	41	30	33	35	39	29	46	34	38	40	29	33	36	39	29	32	35	26	29	32	35	26	29	32	35																																
		20-27	Interior	96	93	8																																																																											

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.

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]

* 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)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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0	B	0-7	Interior	83	83	83	83	83	81	83	83	78	83	83	75	83	82	69	83	79	59	83	76	51	81	66	40	76	52	34	68	42	30	55	37	26	46	32	23	40	29	20	Exposed	83	81	69	83	78	57	83	74	48	81	69	41	78	59	37	75	51	34	72	45	31	56	37	26	44	32	22	38	27	19	33	24	17	29	21	23	26	19	20	7-20	Interior	83	83	83	83	83	79	83	83	75	83	82	71	83	78	58	83	75	49	83	71	42	78	53	35	71	41	30	55	36	26	43	31	23	37	27	20	33	24	18	Exposed	83	78	58	83	75	47	82	67	40	78	55	36	75	46	33	71	41	30	59	37	27	43	31	23	37	27	20	32	23	17	28	20	23	24	18	20	22	16	18	20-27	Interior	84	84	84	84	84	84	84	84	82	84	84	78	84	81	75	84	78	71	84	75	60	84	62	43	81	46	37	76	38	32	70	34	28	56	30	24	46	26	22	Exposed	84	81	75	84	77	68	84	74	55	84	65	45	83	54	40	80	45	36	77	40	33	71	34	28	55	29	24	43	25	21	38	22	18	33	19	16	29	17	21	21	21	21	27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	78	78	76	59	76	66	45	67	52	38	51	42	33	41	37	29	37	33	26	26	26	26	Exposed	78	78	78	78	78	76	78	78	72	78	76	62	78	73	52	75	65	44	71	56	40	52	42	34	41	36	29	35	31	25	31	28	22	27	24	19	24	22	17	21	21	21	C	0-7	Interior	83	83	72	83	80	62	83	76	52	83	72	44	80	64	40	77	56	36	74	49	33	61	39	28	48	34	24	40	29	21	35	25	18	31	22	16	27	20	20	20	20	Exposed	80	64	39	76	54	35	72	46	31	63	40	28	55	36	26	47	33	23	42	30	21	35	26	18	30	22	24	26	19	20	23	17	18	20	22	16	12	12	12	12	7-20	Interior	83	80	64	83	76	52	83	72	43	80	61	38	77	51	35	73	43	32	66	39	29	48	33	24	39	28	21	34	25	18	29	21	16	26	19	21	23	17	19	Exposed	77	51	35	72	42	31	61	38	28	50	34	25	42	31	23	38	28	21	35	26	19	30	22	16	25	19	21	22	16	18	19	21	16	17	19	14	17	19	14	12	12	20-27	Interior	84	83	77	84	79	72	84	76	61	84	71	50	84	60	42	82	50	38	79	42	35	73	36	30	60	31	25	47	27	22	40	19	35	20	17	31	18	23	Exposed	84	59	42	81	48	37	78	41	34	75	37	30	69	33	27	59	30	25	51	28	23	40	23	19	34	20	17	30	17	22	26	23	19	23	20	17	20	18	15	15	15	27-45	Interior	78	78	78	78	78	78	78	78	75	78	78	68	78	75	57	77	71	49	74	61	42	58	46	36	43	38	30	37	33	26	32	29	23	29	26	20	25	23	18	Exposed	78	75	57	76	69	47	72	57	40	61	48	36	50	42	33	42	38	30	39	35	28	33	29	23	28	25	20	24	22	17	21	19	23	19	17	20	17	23	18	18	D	0-7	Interior	83	77	55	83	73	46	81	66	40	77	56	36	74	49	33	69	42	30	60	39	27	46	33	23	38	28	20	33	24	17	29	21	23	26	19	20	23	16	18	Exposed	74	48	33	66	41	29	56	37	26	48	33	24	42	30	21	38	28	20	35	25	18	29	21	23	25	18	20	22	16	17	19	21	16	17	18	18	22	16	12	12	7-20	Interior	83	74	46	81	65	39	77	53	35	74	44	32	66	39	29	55	36	26	47	33	24	38	28	20	32	24	17	28	20	23	24	18	20	22	24	18	19	21	16	16	Exposed	66	39	29	53	35	26	43	31	23	39	28	21	35	26	19	32	23	17	29	21	16	25	18	20	21	23	17	18	20	16	18	18	14	16	19	14	14	14	14	20-27	Interior	84	77	66	84	73	53	84	62	43	82	51	39	79	42	35	76	39	32	73	35	29	57	30	25	44	26	21	38	22	18	33	19	16	29	17	21	26	23	19	Exposed	79	42	35	75	38	31	71	34	28	60	31	25	51	28	23	44	25	21	39	23	19	33	20	16	29	17	21	25	22	18	22	19	16	19	17	14	17	15	12	12	27-45	Interior	78	78	76	78	78	71	78	76	59	77	71	49	74	61	42	68	52	38	56	45	35	42	37	30	36	32	25	31	28	22	27	24	19	24	21	17	21	19	23	Exposed	74	61	42	64	50	37	52	42	34	43	38	30	39	35	28	35	32	25	32	29	23	27	24	19	23	21	17	20	18	22	18	16	19	24	21	17	21	19	15	15	10	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	59	71	51	71	51	71	66	40	71	52	34	68	42	30	55	37	26	46	32	23	40	29	20	Exposed	71	71	69	71	71	57	71	48	71	69	41	71	59	37	71	51	34	71	45	31	56	37	26	44	32	22	38	27	19	33	24	17	29	21	23	26	19	20	7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	70	71	41	30	55	36	26	43	31	23	37	27	20	33	24	18	Exposed	72	72	58	72	72	47	72	67	40	72	55	36	72	46	33	71	41	30	59	37	27	43	31	23	37	27	20	32	23	17	28	20	23	24	18	20	22	16	18	20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	75	81	78	71	81	75	60	81	62	43	81	46	37	76	38	32	70	34	28	56	30	24	46	26	22	Exposed	81	81	75	81	77	68	81	74	55	81	65	45	81	54	40	80	45	36	77	40	33	71	34	28	55	29	24	43	25	21	38	22	18	33	19	16	29	17	21	26	23	19	27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	78	78	76	59	76	66	45	67	52	38	51	42	33	41	37	29	37	33	26	26	26	26	Exposed	78	78	78	78	78	76	78	78	72	78	76	62	78	73	52	75	65	44	71	56	40	52	42	34	41	36	29	35	31	25	31	28	22	27	24	19	24	22	17	21	21	21	C	0-7	Interior	71	71	71	71	71	62	71	52	71	71	64	40	71	56	36	71	49	33	61	39	28	48	34	24	40	29	21	35	25	18	31	22	16	27	20	20	20	20	Exposed	71	64	39	71	54	35	71	46	31	63	40	28	55	36	26	47	33	23	42	30	21	35	26	18	30	22	24	26	19	20	23	17	18	20	22	16	12	12	12	7-20	Interior	72	72	64	72	72	52	72	43	72	61	38	72	51	35	72	43	32	66	39	29	48	33	24	39	28	21	34	25	18	29	21	16	26	19	21	23	17	19	Exposed	72	51	35	72	42	31	61	38	28	50	34	25	42	31	23	38	28	21	35	26	19	30	22	16	25	19	21	22	16	18	19	21	16	17	19	14	17	19	14	12	12	20-27	Interior	81	81	77	81	79	72	81	76	61	81	71	50	81	60	42	81	50	38	79	42	35	73	36	30	60	31	25	47	27	22	40	19	35	20	17	31	18	23	Exposed	81	59	42	81	48	37	78	41	34	75	37	30	69	33	27	59	30	25	51	28	23	40	23	19	34	20	17	30	17	22	26	23	19	23	20	17	20	18	15	15	27-45	Interior	78	78	78	78	78	78	78	78	75	78	78	68	78	75	57	77	71	49	74	61	42	58	46	36	43	38	30	37	33	26	32	29	23	29	26	20	25	23	18	Exposed	78	75	57	76	69	47	72	57	40	61	48	36	50	42	33	42	38	30	39	35	28	33	29	23	28	25	20	24	22	17	21	19	23	19	17	20	17	23	18	18	D	0-7	Interior	71	71	55	71	71	46	71	66	40	71	56	36	71	49	33	69	42	30

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

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.

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

[illegible]

* 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.

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)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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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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[illegible]

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.

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-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)

[illegible]

* 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.

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[illegible]

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