

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

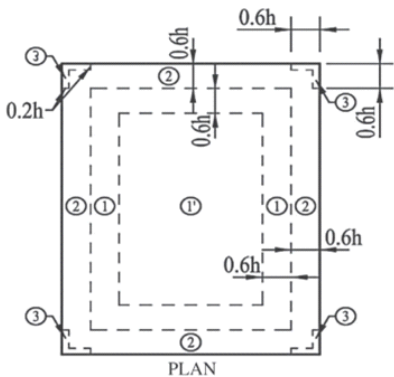
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 with $S_{ds} = 1, 2.4$ respectively per criteria shown on individual span tables sheets.
- $S_1 = 0.5$ & $S_{d1} = 0.6$
- Seismic site class D

Array Assumptions

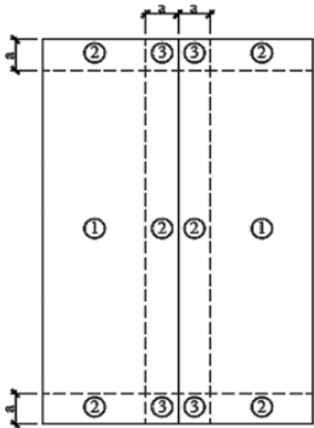
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1” x 67” (~19 sq.ft, 47.65 lbs) and 41” x 80” (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at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

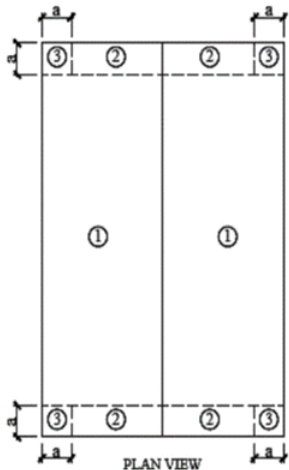
Zone should be considered as per ASCE 7-22, Fig. 30.3-2A to 30.3-2D



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.

*Flashloc DUO for Rafter	
Y+	
Y-	Alternate orientation not allowed

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	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	109	127	127	89	127	123	68	127	87	53	124	70	43	93	58	37	76	48	33	64	41	29									
			Exposed	127	127	127	127	127	99	127	127	83	127	124	70	127	98	60	127	85	52	127	75	46	94	58	38	74	47	32	60	39	28	49	34	24	42	30	21	37	27	29									
		7-20	Interior	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	93	127	127	78	127	124	58	127	75	44	126	58	38	81	46	33	64	39	29	52	35	26									
			Exposed	127	127	127	127	127	89	127	127	72	127	125	60	127	87	51	127	73	43	127	62	39	82	47	33	62	38	28	48	33	25	40	29	22	35	26	29	31	23	25									
		20-27	Interior	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	83	128	89	62	128	67	48	128	53	40	99	42	35	81	38	31									
			Exposed	128	128	128	128	128	128	128	128	128	127	128	128	87	128	126	72	128	86	60	128	73	51	128	53	40	96	42	34	75	36	30	61	31	26	50	28	23	42	25	31								
	27-45	Interior	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	126	129	127	82	129	92	64	125	73	51	78	60	42	62	50	37										
		Exposed	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	96	129	126	81	129	99	69	126	74	52	75	58	41	57	47	36	45	39	31	39	35	28	34	31	24								
	C	0-7	Interior	127	127	127	127	127	124	127	127	91	127	127	77	127	115	66	127	93	57	127	81	50	105	63	40	81	51	34	65	42	29	53	36	26	45	32	23	39	28	30									
			Exposed	127	114	65	127	89	55	127	76	46	114	65	41	91	57	37	79	50	34	69	44	31	54	37	26	44	32	22	37	27	29	33	24	26	29	21	23	26	28	29									
		7-20	Interior	127	127	127	127	127	100	127	127	80	127	127	66	127	97	56	127	81	48	127	69	42	92	51	35	68	41	30	53	35	26	42	31	23	37	27	30	33	24	27									
			Exposed	127	96	55	127	77	46	127	64	40	97	53	36	79	45	33	67	40	30	57	37	27	43	31	23	36	27	30	32	23	26	28	30	23	24	27	29	22	24	16									
20-27		Interior	128	128	128	128	128	128	128	128	128	128	128	98	128	128	80	128	97	67	128	81	57	128	59	42	123	45	36	83	38	31	66	33	27	54	29	24	45	26	22										
		Exposed	128	128	79	128	92	64	128	74	53	128	61	44	128	52	39	112	44	36	89	40	33	67	34	28	53	29	24	43	25	21	37	22	27	33	29	24	29	26	21										
27-45	Interior	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	125	129	129	89	129	124	76	129	82	57	84	63	44	63	51	38	50	42	33	41	37	29	36	33	26										
	Exposed	129	129	124	129	129	128	85	129	103	70	129	85	59	99	72	50	82	62	43	69	54	39	51	42	33	40	36	29	35	31	25	31	27	22	27	24	29	24	31	24										
D	0-7	Interior	127	127	97	127	80	127	122	67	127	94	57	127	81	50	125	70	43	100	62	39	77	49	33	61	40	28	50	35	25	42	30	21	37	27	29	33	24	25											
		Exposed	127	80	49	123	68	42	94	58	38	80	50	34	69	44	31	60	40	28	53	36	26	42	31	22	36	26	28	31	23	24	27	30	21	24	26	19	21	24	17										
	7-20	Interior	127	127	87	127	127	70	127	123	57	127	82	48	127	68	42	126	58	38	89	50	35	65	40	29	49	34	25	40	29	22	35	26	29	31	23	25	27	30	30	22									
		Exposed	127	68	41	125	56	37	82	46	33	68	40	30	57	37	27	48	33	25	42	31	23	35	26	29	30	22	25	26	29	22	23	25	19	31	22	17	27	20	15										
	20-27	Interior	128	128	128	128	128	126	128	128	83	128	98	68	128	81	57	128	68	48	128	57	42	103	43	35	78	37	30	62	32	26	50	28	23	42	24	31	37	22	27										
		Exposed	128	80	56	128	65	46	128	53	40	118	45	36	89	40	33	76	36	30	66	33	27	51	28	23	41	24	30	35	21	26	31	27	23	27	24	20	24	22	16										
27-45	Interior	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	124	76	129	92	65	129	80	56	79	61	42	59	48	36	46	40	32	39	35	28	34	31	24	30	27	22									
	Exposed	129	124	75	129	89	62	126	74	52	83	63	44	69	54	39	58	47	36	49	41	33	39	35	28	34	30	24	29	26	21	25	23	27	22	30	24	30	27	21											
10	B	0-7	Interior	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	109	119	119	89	119	119	68	119	87	53	119	70	43	93	58	37	76	48	33	64	41	29										
			Exposed	119	119	119	119	119	119	119	119	83	119	119	70	119	98	60	119	85	52	119	75	46	94	58	38	74	47	32	60	39	28	49	34	24	42	30	21	37	27	29									
		7-20	Interior	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	93	119	119	78	119	119	58	119	75	44	119	58	38	81	46	33	64	39	29	52	35	26								
			Exposed	119	119	119	119	119	89	119	72	119	119	60	119	87	51	119	73	43	119	62	39	82	47	33	62	38	28	48	33	25	40	29	22	35	26	29	31	23	25										
		20-27	Interior	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	83	124	89	62	124	67	48	124	53	40	99	42	35	81	38	31									
			Exposed	124	124	124	124	124	124	124	124	124	124	124	87	124	124	72	124	86	60	124	73	51	124	53	40	96	42	34	75	36	30	61	31	26	50	28	23	42	25	31									
	27-45	Interior	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127									
		Exposed	127	127	124	127	127	85	127	103	70	127	85	59	99	72	50	82	62	43	69	54	39	51	42	33	40	36	29	35	31	25	31	27	22	27	24	29	24	31	24										
	C	0-7	Interior	119	119	119	119	119	119	119	91	119	119	77	119	115	66	119	93	57	119	81	50	105	63	40	81	51	34	65	42	29	53	36	26	45	32	23	39	28	30										
			Exposed	119	114	65	119	89	55	119	76	46	114	65	41	91	57	37	79	50	34	69	44	31	54	37	26	44	32	22	37	27	29	33	24	26	29	21	23	26	28	29									
		7-20	Interior	119	119	119	119	119	100	119	119	80	119	119	66	119	97	56	119	81	48	119	69	42	92	51	35	68	41	30	53	35	26	42	31	23	37	27	30	33	24	27									
			Exposed	119	96	55	119	77	46	119	64	40	97	53	36	79	45	33	67	40	30	57	37	27	43	31	23	36	27	30	32	23	26	28	30	23	24	27	29	22	24	16									
20-27		Interior	124	124	124	124	124	124	124	124	124	124	124	98	124	124	80	124	97	67	124	81	57	124	59	42	123	45	36	83	38	31	66	33	27	54	29	24													

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.

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		
				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	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	68	77	77	53	77	70	43	77	58	37	76	48	33	64	41	29			
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	68	77	77	53	77	70	43	77	58	37	76	48	33	64	41	29		
		7-20	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	58*	67*	67*	67*	47	67*	58*	38	67*	46	33	64*	39	29	52	35	26		
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	58*	67*	67*	67*	47	67*	58*	38	67*	46	33	64*	39	29	52	35	26	
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	48*	56*	53*	40	56*	42	35	56*	38	31			
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	48*	56*	53*	40	56*	42	35	56*	38	31			
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	42	53*	50*	37			
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	42	53*	50*	37		
60	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	68	77	77	57	77	70	43	77	58	37	76	48	33	64	41	29			
			Exposed	77	77	65	77	77	55	77	76	46	77	65	41	77	57	37	77	50	34	69	44	31	54	37	26	44	32	22	37	27	29	33	24	26	29	21	23	26	29	
		7-20	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	58*	67*	67*	67*	47	67*	58*	38	67*	46	33	64*	39	29	52	35	26	
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	58*	67*	67*	67*	47	67*	58*	38	67*	46	33	64*	39	29	52	35	26	
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	48*	56*	53*	40	56*	42	35	56*	38	31	

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.

[illegible]

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.

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.

[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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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.

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.

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-root must be oriented in the Y- direction as indicated in the image.

[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.

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.

[illegible]

* Cells with an asterisk indicates that the L-root 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.

[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.

* 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.

* 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.

* 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.



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

Flashloc DUO Rafter
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)																																															
				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												
0	B	0-7	Interior	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	147	149	149	135	149	142	125	149	133	81	146	125	61	137	95	54	130	71	48									
			Exposed	149	149	149	149	149	149	149	149	149	149	144	149	149	137	149	148	130	149	142	125	149	136	94	146	126	62	136	91	53	127	65	46	102	57	40	73	50	53	61	44	48							
		7-20	Interior	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149						
			Exposed	149	149	149	149	149	149	149	149	149	149	148	149	149	139	149	149	149	131	149	147	125	149	139	65	149	127	55	141	63	47	129	55	41	67	48	36	58	42	47	51	38	42						
		20-27	Interior	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150						
			Exposed	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150						
	C	0-7	Interior	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151							
			Exposed	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151							
		7-20	Interior	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149					
			Exposed	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149					
		20-27	Interior	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150				
			Exposed	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150			
	D	0-7	Interior	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151					
			Exposed	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151				
		7-20	Interior	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149			
			Exposed	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149		
		20-27	Interior	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150			
			Exposed	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150		
10	B	0-7	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139						
			Exposed	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139			
		7-20	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140			
			Exposed	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140		
		20-27	Interior	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146			
			Exposed	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146		
	C	0-7	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139				
			Exposed	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139		
		7-20	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140		
			Exposed	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140		
		20-27	Interior	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146		
			Exposed	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146		
	D	0-7	Interior	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151															

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

[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.

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			
0	B	0-7	Interior	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	125	127	127	93	127	127	80	127	102	60	127	79	47	112	63	39	84	52	34	69	43	30	57	38	27											
			Exposed	127	127	124	127	127	89	127	127	74	127	111	63	127	89	54	127	77	46	124	67	41	85	52	35	67	42	30	54	36	26	44	32	23	38	28	20	34	25	18												
		7-20	Interior	127	127	127	127	127	127	127	127	127	127	127	127	127	127	125	127	127	82	127	127	69	127	89	51	127	66	40	94	51	35	71	41	30	56	36	27	45	32	24												
			Exposed	127	127	99	127	127	78	127	127	64	127	93	53	127	77	44	127	64	40	126	55	36	72	42	31	54	36	26	42	31	23	37	27	20	32	24	18	29	21	24												
		20-27	Interior	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	78	54	128	59	42	126	46	37	89	39	32	73	35	29												
			Exposed	128	128	128	128	128	128	128	128	128	95	128	128	76	128	92	63	128	76	53	128	64	45	127	47	37	86	38	32	68	33	27	54	29	24	44	26	21	39	23	19											
	27-45	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	124	73	129	82	57	89	65	45	68	53	39	54	44	34													
		Exposed	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													
	C	0-7	Interior	127	127	127	127	127	98	127	127	81	127	125	69	127	98	59	127	84	51	127	73	44	93	57	37	73	45	31	59	39	27	48	34	24	41	30	21	36	26	19												
			Exposed	127	97	58	127	81	49	125	69	42	97	58	38	83	51	34	72	45	31	62	40	28	49	34	24	40	29	21	35	25	18	30	22	24	27	19	21	24	26	18												
		7-20	Interior	127	127	127	127	127	88	127	127	71	127	126	58	127	86	49	127	71	42	127	60	38	81	45	32	60	38	28	46	32	24	39	28	21	34	25	19	30	22	25												
			Exposed	127	85	49	127	68	41	127	56	37	85	47	33	70	41	30	58	37	27	50	34	25	39	29	21	34	25	18																								

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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					
				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																																				
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	93	94	94	80	94	60	94	79	47	94	63	39	84	52	34	69	43	30	57	38	27	18	25	25	25	25	25	25	25																																
			Exposed	94	94	94	94	94	89	94	94	74	94	94	63	94	89	54	94	77	46	94	67	41	85	52	35	67	42	30	54	36	26	44	32	23	38	28	20	34	25	18	25	25	25	25	25	25																																	
		7-20	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	82	94	94	69	94	89	51	94	66	40	94	51	35	71	41	30	56	36	27	45	32	24	24	24	24	24	24	24	24	24																															
			Exposed	94	94	94	94	94	78	94	94	64	94	93	53	94	77	44	94	64	40	94	55	36	72	42	31	54	36	26	42	31	23	37	27	20	32	24	18	29	21	24	24	24	24	24	24	24	24																																
		20-27	Interior	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	73	100*	78	54	100*	59	42	100*	46	37	89*	39	32	73	35	29	29	29	29	29	29	29	29																																
			Exposed	100*	100*	100*	100*	100*	100*	100*	100*	95*	100*	100*	76	100*	92*	63	100*	76	53	100*	64	45	100*	47	37	86	38	32	68	33	27	54	29	24	44	26	21	39	23	19	23	19	23	19	23	19	23																																
	27-45	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*																																	
		Exposed	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*																																
	C	0-7	Interior	94	94	94	94	94	94	94	94	81	94	94	69	94	94	59	94	84	51	94	73	44	93	57	37	73	45	31	59	39	27	48	34	24	41	30	21	36	26	19	26	18	25	25	25	25	25	25																															
			Exposed	94	94	58	94	81	49	94	69	42	94	59	38	83	51	34	72	45	31	62	40	28	49	34	24	40	29	21	35	25	18	30	22	24	27	19	21	24	26	18	25	25	25	25	25	25																																	
		7-20	Interior	94	94	94	94	94	88	94	94	71	94	94	58	94	86	49	94	71	42	94	60	38	81	45	32	60	38	28	46	32	24	39	28	21	34	25	19	30	22	25	25	25	25	25	25	25	25	25																															
			Exposed	94	85	49	94	68	41	94	56	37	85	47	33	70	41	30	58	37	27	50	34	25	39	29	21	34	25	18	29	21	24	25	19	21	22	25	18	20	22	16	24	24	24	24	24	24	24																																
20-27		Interior	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	86	100*	100*	70	100*	85	59	100*	71	50	100*	52	39	95*	41	34	74	35	29	59	31	25	48	27	22	41	24	20	20	20	20	20	20	20	20																																	
		Exposed	100*	100*	70	100*	81	56	100*	65	46	100*	54	40	100*	45	36	93*	40	33	80	37	30	60	31	26	47	27	22	39	23	19	34	20	25	30	18	22	27	24	20	24	20	24	20	24																																			
27-45	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*																																		
	Exposed	95*	95*	94*	95*	95*	95*	95*	95*	91*	62	95*	76	52	87*	64	44	72	55	40	60	48	36	44	39	31	37	33	26	32	29	23	28	25	22	18	22	20	24	20	24	20	24	20	24	20	24																																		
D	0-7	Interior	94	94	87	94	94	72	94	94	60	94	85	51	94	73	44	94	64	40	91	56	36	70	44	31	55	37	26	45	32	38	28	20	34	25	26	30	22	23	23	23	23	23	23	23	23	23	23																																
		Exposed	94	73	44	94	61	39	85	52	35	72	45	31	62	40	28	54	37	26	48	33	24	39	28	20	33	24	26	29	21	23	25	18	20	22	24	17	20	22	15	24	24	24	24	24	24	24																																	
	7-20	Interior	94	94	76	94	94	61	94	89	50	94	72	42	94	60	38	94	51	35	79	44	32	57	37	27	43	31	23	37	27	20	32	24	18	29	21	23	25	18	21	21	21	21	21	21	21	21																																	
		Exposed	94	60	38	90	49	34	72	41	31	59	37	28	50	34	25	42	31	23	39	28	21	33	24	18	28	20	23	24	18	20	21	23	17	19	21	16	25	18	14	14	14	14	14	14	14	14																																	
	20-27	Interior	104*	104*	104*	104*	104*	91	104*	104*	73	104*	86	59	104*	71	50	104*	59	42	104*	50	39	91	40	33	69	34	28	55	29	24	44	26	21	38	23	19	34	20	25	25	25	25	25	25	25	25	25																																
		Exposed	104*	70	49	104*	57	41	104*	47	37	95	40	33	80	37	30	68	33	28	59	31	25	45	26	21	38	22	18	33	19	24	29	25	21	25	22	19	22	20	16	24	24	24	24	24	24	24																																	
27-45	Interior	100*	100*	100*	100*	100*	100*	100*	100*	98*	100*	100*	80	100*	98*	67	100*	83	57	99*	71	49	69	54	39	52	42	34	41	37	29	36	32	25	32	28	22	28	25	20	20	20	20	20	20	20	20																																		
	Exposed	100*	97*	67	100*	80	55	91*	66	46	73	56	40	60	48	36	50	42	33	43	38	30	36	32	26	31	28	22	27	24	19	24	21	25	21	19	22	18	25	20	24	20	24	20	24	20	24																																		
40	B	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90																																	
			Exposed	90	90	90	90	90	89	90	90	74	90	90	63	90	89	54	90	77	46	90	67	41	85	52	35	67	42	30	54	36	26	44	32	23	38	28	20	34	25	18	25	25	25	25	25	25	25																																
		7-20	Interior	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	82	94*	94*	69	94*	89*	51	94*	66	40	94*	51	35	71	41	30	56	36	27	45	32	24	24	24	24	24	24	24	24	24	24	24																														
			Exposed	94*	94*	94*	94*	94*	78	94*	94*	64	94*	93*	53	94*	77	44	94*	64	40	94*	55	36	72	42	31	54	36	26	42	31	23	37	27	20	32	24	18	29	21	24	24	24	24	24	24	24	24																																
		20-27	Interior	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*																															
			Exposed	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	76*	80*	80*	63	80*	76*	53	80*	64	45	80*	47	37	80*	38	32	68	33	27	54	29	24	44	26	21	39	23	19	23	19	23	19	23	19	23																																
	27-45	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*	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*	75*	75*																																
	C	0-7	Interior	90	90	90	90	90	90	90	90	81	90	90	69	90	90	59	90	84	51	90	73	44	90	57	37	73	45	31	59	39	27	48	34	24	41	30	21	36	26	19	26	18	25	25	25	25	25	25																															
			Exposed	90	90	58	90	81	49	90	69	42	90	59	38	83	51	34	72	45	31	62	40	28	49	34	24	40	29	21	35	25	18	30	22	24	27	19	21	24	26	18	25	25	25	25	25	25																																	
		7-20	Interior	94*	94*	94*	94*	94*	88	94*	94*	71	94*	94*	58	94*	86	49	94*	71	42	94*	60	38	81	45	32	60	38																																																				

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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.

[illegible]

* 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]

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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.

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

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	1	2	3																																	
0	B	0-7	Interior	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	125	127	127	93	127	127	80	127	102	60	127	79	47	112	63	39	84	52	34	69	43	30	57	38	27																																					
			Exposed	127	127	124	127	127	89	127	127	74	127	111	63	127	89	54	127	77	46	124	67	41	85	52	35	67	42	30	54	36	26	44	32	23	38	28	20	34	25	18																																							
		Exposed	127	127	99	127	127	78	127	127	64	127	93	53	127	77	44	127	64	40	126	55	36	72	42	31	54	36	26	42	31	23	37	27	20	32	24	18	29	21	24																																								
		Exposed	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126																																					
		Exposed	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121																																			
		Exposed	127	97	58	127	81	49	125	69	42	97	59	38	83	51	34	72	45	31	62	40	28	49	34	24	40	29	21	35	25	18	30	22	24	27	19	21	24	26	18																																								

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																																				
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94																																	
			Exposed	94	94	94	94	94	89	94	94	74	94	94	63	94	89	54	94	77	46	94	67	41	85	52	35	67	42	30	54	36	26	44	32	23	38	28	20	34	25	18	32	24	25	18	32	24	25	18																															
		7-20	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	82	94	69	94	89	51	35	71	41	30	56	36	27	45	36	27	45	36	27	45	36	27	45	36	27	45	36	27	45																																
			Exposed	94	94	94	94	94	78	94	94	64	94	93	53	94	77	44	94	64	40	94	55	36	72	42	31	54	36	26	42	31	23	37	27	20	32	24	18	29	21	24	18	29	21	24	18	29	21	24																															
		20-27	Interior	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*																																
			Exposed	100*	100*	100*	100*	100*	100*	100*	100*	100*	95*	100*	100*	76	100*	92*	63	100*	76	53	100*	64	45	100*	47	37	86	38	32	68	33	27	54	29	24	44	26	21	39	23	19	34	24	25	18	34	24	25																															
	27-45	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*																																	
		Exposed	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*																																	
	C	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94																															
			Exposed	94	94	58	94	81	49	94	69	42	94	59	38	83	51	34	72	45	31	62	40	28	49	34	71	42	94	60	38	81	45	32	60	38	28	46	32	24	39	28	21	34	25	19	30	22	25	18	32	24	25																												
		7-20	Interior	94	94	94	94	94	88	94	94	71	94	94	58	94	86	49	94	71	42	94	60	38	81	45	32	60	38	28	46	32	24	39	28	21	34	25	19	30	22	25	18	30	22	25	18	30	22	25																															
			Exposed	94	85	49	94	68	41	94	56	37	85	47	33	70	41	30	58	37	27	50	34	25	39	29	21	34	25	18	28	20	23	24	18	20	21	23	17	19	21	46	25	18	14	24	18	14																																	
20-27		Interior	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	86	100*	100*	70	100*	85	59	100*	71	50	100*	52	39	95*	41	34	74	35	29	59	31	25	48	27	22	41	24	20	24	20	24	20	24	20																																	
		Exposed	100*	100*	70	100*	81	56	100*	65	46	100*	54	40	100*	45	36	93*	40	33	80	37	30	60	31	26	47	27	32	39	23	19	34	20	25	30	18	22	27	24	20	24	20	24	20																																				
27-45	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*																																		
	Exposed	95*	95*	94*	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*																																		
D	0-7	Interior	94	94	87	94	94	72	94	94	60	94	85	51	94	73	44	94	64	40	91	56	36	70	44	31	55	37	26	45	32	23	38	28	20	34	25	26	30	22	23	26	30	22	23	26	30	22	23																																
		Exposed	94	73	44	94	61	39	85	52	35	72	45	31	62	40	28	54	37	26	48	33	24	39	28	20	33	24	29	21	23	25	18	20	22	24	17	20	22	45	20	22	45	20	22	45																																			
	7-20	Interior	94	94	76	94	94	61	94	89	50	94	72	42	94	60	38	94	51	35	79	44	32	57	37	27	43	31	23	37	27	20	32	24	18	29	21	23	25	18	21	24	18	21	24	18	21																																		
		Exposed	94	60	38	90	49	34	72	41	31	59	37	28	50	34	25	42	31	23	39	28	21	33	24	18	28	20	23	24	18	20	21	23	17	19	21	46	25	18	14	24	18	14																																					
	20-27	Interior	104*	104*	104*	104*	104*	91	104*	104*	73	104*	86	59	104*	71	50	104*	59	42	104*	50	39	91	40	33	69	34	28	55	29	24	44	26	21	38	23	19	34	20	25	24	20	24	20	24	20																																		
		Exposed	104*	70	49	104*	57	41	104*	47	37	95	40	33	80	37	30	68	33	28	59	31	25	45	26	21	38	22	18	33	19	24	29	25	21	25	22	19	22	20	24	20	24	20	24	20																																			
27-45	Interior	100*	100*	100*	100*	100*	100*	100*	100*	100*	98*	100*	100*	80	100*	98*	67	100*	83	57	99*	71	49	69	54	39	52	42	34	41	37	29	36	32	25	32	28	22	28	25	20	24	20	24	20																																				
	Exposed	100*	97*	67	100*	80	55	91*	66	46	73	56	40	60	48	36	50	42	33	43	38	30	36	32	26	31	28	22	27	24	19	24	21	25	21	19	22	18	22	18	25	20	24	20																																					
40	B	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90																																
			Exposed	90	90	90	90	90	89	90	90	74	90	90	63	90	89	54	90	77	46	90	67	41	85	52	35	67	42	30	54	36	26	44	32	23	38	28	20	34	25	18	32	24	25	18	32	24	25																																
		7-20	Interior	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*	94*																															
			Exposed	94*	94*	94*	94*	94*	78	94*	94*	64	94*	93*	53	94*	77	44	94*	64	40	94*	55	36	72	42	31	54	36	26	42	31	23	37	27	20	32	24	18	29	21	23	25	18	21	24	18	21																																	
		20-27	Interior	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*																																
			Exposed	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*	80*																																
	27-45	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*	75*																																	
	C	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90																															
			Exposed	90	90	58	90	81	49	90	69	42	90	59	38	83	51	34	72	45	31	62	40	28	49	34	71	42	94	60	38	81	45	32	60	38	28	46	32	24	39	28	21	34	25	19	30	22	25	18	32	24	25																												
		7-20	Interior	94*	94*	94*	94*	94*	88*	94*	94*	71	94*	94*	58	94*	86*	49	94*	94*	60	38	81	45	32	60	38	28	46	32	24	39	28	21	34	25	19</																																												

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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[illegible]

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

[illegible]

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[illegible]

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]

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

[illegible]

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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.