

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

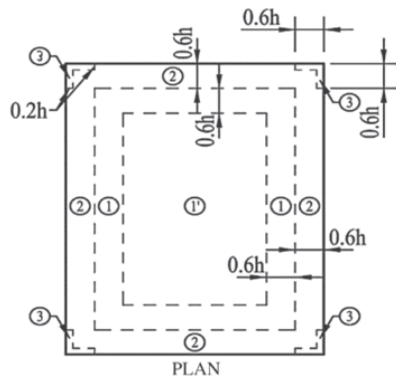
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 with $S_{ds} = 1, 2.4$ respectively per criteria shown on individual span tables sheets.
- $S_1 = 0.5$ & $S_{d1} = 0.6$
- Seismic site class D

Array Assumptions

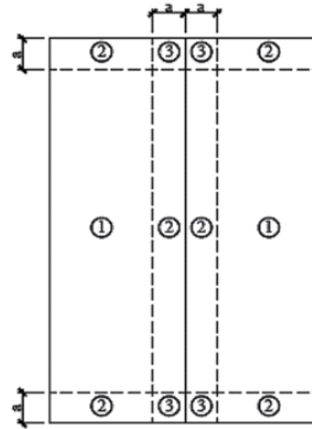
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at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

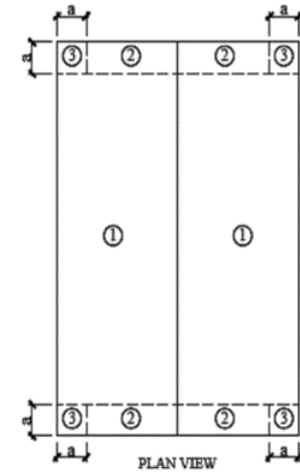
Zone should be considered as per ASCE 7-22, Fig. 30.3-2A to 30.3-2D



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

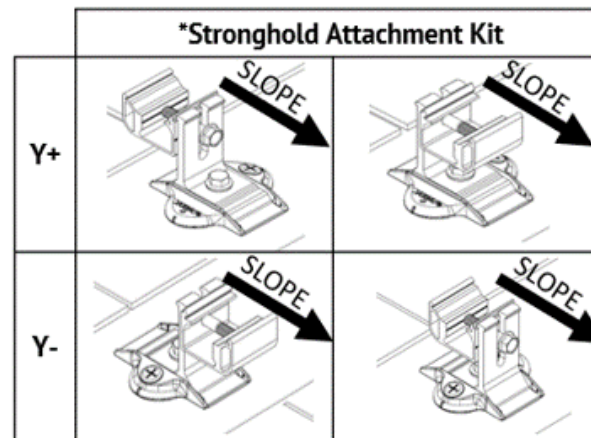


Gable Roofs $7^\circ < \theta \leq 27^\circ$



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

Rails can be installed in these possible orientations.



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

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[illegible]

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

[illegible]

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ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

19 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

Stronghold
Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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[illegible]

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																								
				90			95			100			105			110			115			120			130			140			150			160			170			180				
				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	101	101	101	101	101	101	101	101	101	101	96	101	101	96	101	101	92	101	101	88	101	97	84	101	90	78	97	84	73	91	79	68	86	75	65	81	71	62	77	67	60
			Exposed	101	101	91	101	100	87	101	95	83	101	91	79	101	87	75	97	84	72	93	80	70	86	75	65	80	70	62	76	66	59	71	63	55	68	60	52	65	58	59		
		7-20	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	98	102	94	81	102	86	74	94	80	69	87	74	65	81	70	62	76	66	60	72	63	57
			Exposed	102	102	88	102	97	83	102	92	79	102	87	75	98	83	72	93	79	69	89	76	66	82	70	62	76	65	59	71	62	55	67	60	52	63	57	59	61	53	56		
		20-27	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	98	102	98	89	102	90	82	102	83	76	98	77	71	92	73	66	87	68	63	82	65	61
			Exposed	102	102	98	102	102	92	102	96	87	102	91	83	102	87	79	102	83	75	100	79	72	92	73	67	86	68	63	80	64	60	76	61	57	72	59	54	68	55	50		
	27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	96	103	98	89	91	82	92	85	77	86	80	72	80	75	68	76	71	65	
		Exposed	103	103	103	103	103	99	103	103	94	103	99	89	103	94	85	99	90	82	94	86	78	86	80	72	80	75	68	74	70	64	70	66	61	66	63	59	63	61	55			
	C	0-7	Interior	101	101	94	101	101	89	101	98	85	101	93	81	101	89	77	99	86	74	95	82	71	88	77	66	82	72	63	77	68	60	73	64	57	69	62	53	66	59	61		
			Exposed	101	89	77	98	85	73	93	81	70	89	77	67	85	74	65	82	71	63	79	69	61	73	64	57	69	61	53	65	58	60	62	55	56	59	61	53	56	59	59		
		7-20	Interior	102	102	91	102	100	86	102	94	81	102	90	77	101	85	74	96	81	71	92	78	68	84	72	63	78	67	60	73	63	57	68	61	53	65	58	60	62	55	58		
			Exposed	101	85	74	95	80	70	90	76	66	85	73	64	81	70	62	77	67	60	74	64	58	69	61	54	64	58	60	61	54	57	59	61	53	55	58	59	52	55	47		
20-27		Interior	102	102	101	102	102	95	102	99	90	102	94	85	102	89	81	102	85	77	102	81	74	95	75	69	88	70	64	82	65	61	78	62	59	73	60	55	70	57	52			
		Exposed	102	89	81	102	84	77	101	80	73	96	76	69	92	72	66	88	69	64	84	66	62	78	63	59	73	59	55	68	56	51	65	52	58	62	60	55	60	57	52			
27-45	Interior	103	103	103	103	103	102	103	103	97	103	101	92	103	97	88	102	93	84	97	89	80	89	82	74	82	77	69	76	72	65	72	68	62	67	64	60	64	62	57				
	Exposed	103	97	87	100	91	83	95	87	79	90	83	75	85	79	72	81	76	69	78	73	66	72	68	62	67	64	59	63	61	56	61	58	52	58	55	60	55	52	57				
D	0-7	Interior	101	100	86	101	95	82	101	90	78	100	86	74	95	82	71	91	79	69	88	76	66	81	71	62	76	67	59	72	63	55	68	60	52	64	58	59	62	54	56			
		Exposed	95	82	71	90	78	68	86	75	65	82	72	63	79	69	61	76	59	73	64	57	68	61	52	64	57	59	61	53	55	58	60	52	55	57	49	52	54	46				
	7-20	Interior	102	96	83	102	91	78	102	86	74	96	82	71	92	78	68	87	75	65	83	72	63	77	66	60	71	63	56	67	60	52	63	57	59	61	53	56	58	60	53			
		Exposed	91	78	68	86	74	65	82	70	62	78	67	60	74	64	58	71	62	56	68	61	53	64	57	60	60	63	56	57	60	52	54	56	49	50	53	46	58	60	44			
	20-27	Interior	102	101	92	102	95	86	102	90	82	102	85	78	102	81	74	98	78	71	94	74	68	87	69	64	81	64	60	76	61	57	72	59	54	68	55	50	65	52	58			
		Exposed	102	81	74	97	77	70	92	73	67	88	69	64	84	66	62	81	64	60	77	62	58	72	59	54	67	55	60	64	51	57	61	59	53	58	55	50	55	52	47			
27-45	Interior	103	103	99	103	103	93	103	98	88	102	93	84	97	89	80	92	85	77	88	82	74	81	76	68	75	71	64	70	66	61	66	63	59	63	61	55	60	58	52				
	Exposed	97	89	80	91	84	76	86	80	72	82	76	69	78	73	66	74	70	64	71	68	62	66	63	59	63	60	55	60	57	51	56	53	58	53	61	55	60	58	52				
10	B	0-7	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			
			Exposed	95	95	91	95	95	87	95	95	83	95	91	79	95	87	75	95	84	72	93	80	70	86	75	65	80	70	62	76	66	59	71	63	55	68	60	52	65	58	59		
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	93	95	95	88	95	94	85	94	81	95	86	74	94	80	69	87	74	65	81	70	62	76	66	60	72	63	57			
			Exposed	95	95	88	95	95	83	95	92	79	95	87	75	95	83	72	93	79	69	89	76	66	82	70	62	76	65	59	71	62	55	67	60	52	63	57	59	61	53	56		
		20-27	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		
			Exposed	99	99	98	99	99	92	99	96	87	99	91	83	99	83	75	99	79	72	92	73	67	86	68	63	80	64	60	76	61	57	72	59	54	68	55	50					
	27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102			
		Exposed	102	102	102	102	102	99	102	102	94	102	99	89	102	94	85	99	80	82	94	86	78	86	80	72	80	75	68	74	70	64	70	66	61	66	63	59	63	61	55			
	C	0-7	Interior	95	95	94	95	95	89	95	95	85	95	93	81	95	89	77	95	86	74	95	82	71	88	77	66	82	72	63	77	68	60	73	64	57	69	62	53	66	59	61		
			Exposed	95	89	77	95	85	73	93	81	70	89	77	67	85	74	65	82	71	63	79	69	61	73	64	57	69	61	53	65	58	60	62	55	56	59	61	53	56	59	59		
		7-20	Interior	95	95	91	95	95	86	95	94	81	95	90	77	95	85	74	95	81	71	92	78	68	84	72	63	78	67	60	73	63	57	68	61	53	65	58	60	62	55	58		
			Exposed	95	85	74	95	80	70	90	76	66	85	73	64	81	70	62	77	67	60	74	64	58	69	61	54	64	58	60	61	54	57	59	61	53	55	58	59	52	55	47		
20-27		Interior	99	99	99	99	99	95	99	99	90	99	94	85	99	89	81	99	85	77	99	81	74	95	75	69	88	70	64	82	65	61	78	62	59	73	60	55	70	57	52			
		Exposed	99	89	81	99	84	77	99	80	73	96	76	69	92	72	66	88	69	64	84	66	62	78	63	59	73	59	55	68	56	51	65	52	58	62	60	55	60	57	52			
27-45	Interior	102	102	102	102	102	102	102	102	97	102	101	92	102	97	88	102	93	84	97	89	80	89	82	74	82	77	69	76	72	65	72	68	62	67	64	60	64						

[illegible]

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.

[illegible]

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
				90			95			100			105			110			115			120			130			140			150			160			170			180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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				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	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	10

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.



ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

19 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

Stronghold
Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
90	B	0-7	Interior	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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

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.

* 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 astrisks indicates that the L-root 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						
0	B	0-7	Interior	101	101	101	101	101	101	101	101	101	101	101	96	101	101	96	101	101	92	101	101	88	101	97	84	101	90	78	97	84	73	91	79	68	86	75	65	81	71	62	77	67	60
			Exposed	101	101	91	101	100	87	101	95	83	101	91	79	101	87	75	97	84	72	93	80	70	86	75	65	80	70	62	76	66	59	71	63	55	68	60	52	65	58	59			
		7-20	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	98	102	90	82	102	83	76	98	77	71	92	73	66	87	68	63	82	65	61
			Exposed	102	102	98	102	102	92	102	96	87	102	91	83	102	87	79	102	83	75	100	79	72	92	73	67	86	68	63	80	64	60	76	61	57	72	59	54	68	55	50			
		20-27	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102		
			Exposed	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103		
	C	27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103		
			Exposed	103	103	103	103	103	99	103	103	94	103	99	89	103	94	85	99	90	82	94	86	80	72	80	75	68	74	70	64	70	66	61	66	63	59	63	61	55	60	57	52		
		0-7	Interior	101	101	94	101	101	89	101	98	85	101	93	81	101	89	77	99	86	74	95	82	71	88	77	66	82	72	63	77	68	60	73	64	57	69	62	53	66	59	61			
			Exposed	101	89	77	98	85	73	93	81	70	89	77	67	85	74	65	82	71	63	79	69	61	73	64	57	69	61	53	65	58	60	62	55	56	59	61	53	56	59	59			
		7-20	Interior	102	102	91	102	100	86	102	94	81	102	90	77	101	85	74	96	81	71	92	78	68	84	72	63	78	67	60	73	63	57	68	61	53	65	58	60	62	55	58			
			Exposed	101	85	74	95	80	70	90	76	66	85	73	64	81	70	62	77	67	60	74	64	58	69	61	54	64	58	60	61	54	57	59	61	53	55	58	59	52	55	47			
D	20-27	Interior	102	102	101	102	102	95	102	99	90	102	94	85	102	89	81	102	85	77	102	81	74	95	75	69	88	70	64	82	65	61	78	62	59	73	60	55	70	57	52				
		Exposed	102	89	81	102	84	77	101	80	73	96	76	69	92	72	66	88	69	64	84	66	62	78	63	59	73	59	55	68	56	51	65	52	58	62	60	55	60	57	52				
	27-45	Interior	103	103	103	103	103	103	103	103	97	103	101	92	103	97	88	102	93	84	97	89	80	89	82	74	82	77	69	76	72	65	72	68	62	67	64	60	64	62	57				
		Exposed	103	97	87	100	91	83	95	87	79	90	83	75	85	79	72	81	76	69	78	73	66	72	68	62	67	64	59	63	61	56	61	58	52	58	55	60	55	52	57				
	B	0-7	Interior	101	100	86	101	95	82	101	90	78	100	86	74	95	82	71	91	79	69	88	76	66	81	71	62	76	67	59	72	63	55	68	60	52	64	58	59	62	54	56			
			Exposed	95	82	71	90	78	68	86	75	65	82	72	63	79	69	61	76	59	63	74	64	57	68	61	52	64	57	59	61	53	55	58	60	52	55	57	49	52	54	46			
7-20		Interior	102	96	83	102	91	78	102	86	74	96	82	71	92	78	68	87	75	65	83	72	63	77	66	60	71	63	56	67	60	52	63	57	59	61	53	56	58	60	53				
		Exposed	91	78	68	86	74	65	82	70	62	78	67	60	74	64	58	71	62	56	68	61	53	64	57	60	60	53	56	57	60	52	54	56	49	50	53	46	58	60	44				
20-27		Interior	102	101	92	102	95	86	102	90	82	102	85	78	102	81	74	98	78	71	94	74	68	87	69	64	81	64	60	76	61	57	72	59	54	68	55	50	65	52	58				
		Exposed	102	81	74	97	77	70	92	73	67	88	69	64	84	66	62	81	64	60	77	62	58	72	59	54	67	55	60	64	51	57	61	59	53	58	55	50	55	52	47				
10	C	27-45	Interior	103	103	99	103	103	93	103	98	88	102	93	84	97	89	80	92	85	77	88	82	74	81	76	68	75	71	64	70	66	61	66	63	59	63	61	55	60	58	52			
			Exposed	97	89	80	91	84	76	86	80	72	82	76	69	78	73	66	74	70	64	71	68	62	66	63	59	63	60	55	60	57	51	56	53	58	53	61	55	60	58	52			
		0-7	Interior	95	95	94	95	95	89	95	95	85	95	93	81	95	89	77	95	86	74	95	82	71	88	77	66	82	72	63	77	68	60	73	64	57	69	62	53	66	59	61			
			Exposed	95	89	77	95	85	73	93	81	70	89	77	67	85	74	65	82	71	63	79	69	61	73	64	57	69	61	53	65	58	60	62	55	56	59	61	53	56	59	59			
		7-20	Interior	95	95	91	95	95	86	95	94	81	95	90	77	95	85	74	95	81	71	92	78	68	84	72	63	78	67	60	73	63	57	68	61	53	65	58	60	62	55	58			
			Exposed	95	85	74	95	80	70	90	76	66	85	73	64	81	70	62	77	67	60	74	64	58	69	61	54	64	58	60	61	54	57	59	61	53	55	58	59	52	55	47			
20	D	20-27	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				
			Exposed	99	99	98	99	99	92	99	96	87	99	91	83	99	83	75	99	79	72	92	73	67	86	68	63	80	64	60	76	61	57	72	59	54	68	55	50						
		27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102		
			Exposed	102	97	87	100	91	83	95	87	79	90	83	75	85	79	72	81	76	69	78	73	66	72	68	62	67	64	59	63	61	56	61	58	52	58	55	60	55	52	57			
		0-7	Interior	95	95	86	95	95	82	95	90	78	95	86	74	95	82	71	91	79	69	88	76	66	81	71	62	76	67	59	72	63	55	68	60	52	64	58	59	62	54	56			
			Exposed	95	82	71	90	78	68	86	75	65	82	72	63	79	69	61	76	59	63	74	64	57	68	61	52	64	57	59	61	53	55	58	60	52	55	57	49	52	54	46			
B	7-20	Interior	95	95	83	95	91	78	95	86	74	95	82	71	92	78	68	87	75	65	83	72	63	77	66	60	71	63	56	67	60	52	63	57	59	61	53	56	58	60	53				
		Exposed	91	78	68	86	74	65	82	70	62	78	67	60	74	64	58	71	62	56	68	61	53	64	57	60	60	53	56	57	60	52	54	56	49	50	53	46	58	60	44				
	20-27	Interior	100	100	92	100	95	86	100	90	82	100	85	78	100	81	74	98	78	71	94	74	68	87	69	64	81	64	60	76	61	57	72	59	54	68	55	50	65	52	58				
		Exposed	100	81	74	97	77	70	92	73	67	88	69	64	84	66	62	81	64	60	77	62	58	72	59	54	67	55	60	64	51	57	61	59	53	58	55	50	55	52	47				
	27-45	Interior	102	102	99	102	102	93	102	98	88	102	93	84	97	89	80	92	85	77	88	82	74	81	76	68	75	71	64	7															

* 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.