

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 7-10 Sec 30.4.2
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, $k_{zt} = 1.0$

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

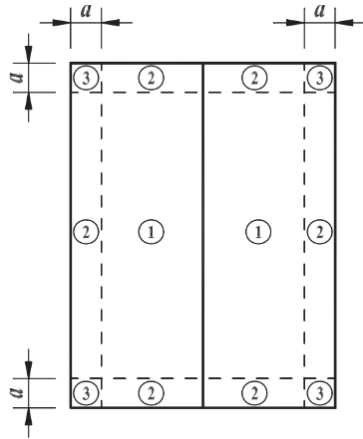
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 per criteria shown on individual span tables sheets.
- $S_1 = 0.5$
- Seismic site class D

Array Assumptions

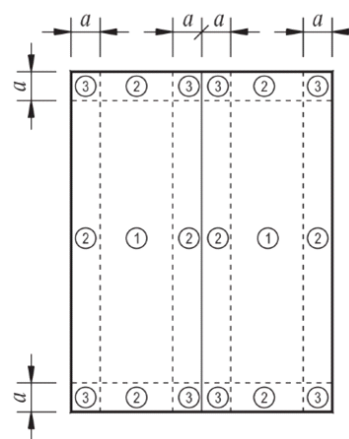
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at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

Span Tables

Zone should be considered as per ASCE 7-10, Fig. 30.4-2A to 30.4-2D

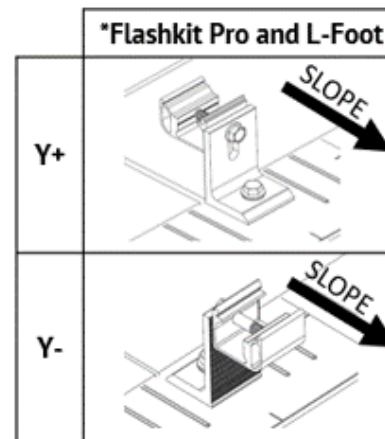


Gable Roofs $\theta \leq 7^\circ$



Gable Roofs $7^\circ < \theta \leq 45^\circ$

Rails can be installed in these possible orientations.





30 ft
Roof Height

18.66 sq.ft
Module Area

CROSS-SLOPE
Rail Direction

NXT COMBO

L-Foot

Attachment

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)	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	86	86	80	86	86	76	86	85	73	86	82	70	86	79	68	86	76	65	86	74	63	84	69	59	79	65	54	75	62	50	72	59	46	69	55	41	66	52	36	53	39							
		7-27	86	86	78	86	86	75	86	85	72	86	82	70	86	79	67	86	77	65	86	74	63	86	70	59	82	66	55	78	63	51	75	60	48	71	57	44	68	53	39									
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	84	84	81	81	81	81	76	76	76	71	71	71	67	67	67	67	63	63	63	63	59	59	56	56	56								
	C	0-7	86	81	69	86	77	66	86	74	64	86	72	61	84	69	59	81	67	56	79	65	53	74	61	49	70	57	43	67	53	37	64	49	47	61	46	44	58	40	39									
		7-27	86	81	69	86	78	66	86	75	64	86	72	61	86	70	59	84	67	57	81	65	54	77	62	50	73	58	46	69	54	40	66	50	35	63	47	46	61	43	42									
		27-45	87	87	87	86	86	86	82	82	82	82	79	79	79	76	76	73	73	73	70	70	70	65	65	65	61	61	61	57	57	57	54	54	54	51	51	48	48	48	48	48								
10	D	0-7	86	76	65	86	72	62	85	70	60	82	67	57	79	65	54	76	63	51	74	61	48	70	56	42	66	52	36	63	48	46	60	44	41	57	38	37	53	34	33									
		7-27	86	76	65	86	73	62	86	70	60	85	68	57	82	66	55	79	63	52	77	61	50	72	58	45	68	53	39	65	49	34	62	46	45	59	41	39	56	36	35									
		27-45	84	84	84	80	80	76	76	73	73	73	70	70	67	67	65	65	65	65	65	65	60	60	60	56	56	53	53	49	49	49	47	47	47	44	44	44	44	44										
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	D	0-7	72	72	65	72	72	62	72	70	60	72	67	57	72	65	54	72	63	51	72	61	48	70	56	42	66	52	36	63	48	46	60	44	41	57	38	37	53	34	33									
		7-27	72	72	65	72	72	62	72	70	60	72	68	57	72	66	55	72	63	52	72	61	50	69	58	45	67	53	39	64	49	34	62	46	45	59	41	39	56	36	35									
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		7-27	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	55	61	51	59	59	48	58	57	44	57	53	39											
		27-45	78	78	78	78	78	78	78	78	78	78	78	77	77	76	76	74	74	71	71	71	68	68	68	65	65	65	62	62	62	59	59	59	56	56	56	56	56											
	C	0-7	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	60	54	60	49	60	57	43	60	53	37	60	49	47	59	46	44	58	40	39								
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		7-27	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	55	61	51	59	59	48	58	57	44	57	53	39											
		27-45	71	71	71	70	70	69	69	69	67	67	67	66	66	66	64	64	63	63	63	63	60	60	60	58	58	58	55	55	55	53	53	53	50	50	48	48	48											
	D	0-7	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	60	54	60	48	60	56	42	60	52	36	60	48	46	59	44	41	57	38	37	53	34	33					
		7-27	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	55	61	51	59	59	48	58	57	44	57	53	39									
		27-45	71	71	71	69	69	68	68	68	66	66	66	64	64	63	63	63	63	63	61	61	61	58	58	58	55	55	55	53	53	53	49	49	49	47	47	47	44	44	44									
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		7-27	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	56	56	56	56	56	56	56	56	56	56	56									
		27-45	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	65	65	64	64	62	62	62	60	60	60	58	58	58	56	56	56	54	54	52	52	52	52										
	C	0-7	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	53	54	54	54	54	54	54	54	53	54	54	54	54	54	54	54	54	54	54									
		7-27	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	56	56	56	56	56	56	56	56	56	56	56									
		27-45	66	66	66	66	66	66	66																																									

* 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.

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.



Category
II

30 ft
Roof Height

$$S_s = 1.25$$

18.66 sq.ft
Module Area

ORIENTATION

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO

L-Foot

Attachment

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

[illegible]

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

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

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.



ASCE 7-10
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

18.66 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

L-Foot
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)	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	102	102	96	102	102	91	102	102	87	102	98	83	102	94	80	102	91	77	102	88	74	100	82	69	95	77	65	90	73	62	86	69	59	82	66	56	78	63	53
		7-27	102	102	93	102	102	89	102	102	86	102	99	83	102	95	80	102	92	77	102	88	75	102	83	70	98	78	66	93	74	63	89	71	61	85	67	58	81	65	55
		27-45	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	101	101	101	99	99	99	94	93	90	88	88	86	84	84	81	80	80	77	76	76	73	73	73	
	C	0-7	102	97	82	102	93	78	102	89	75	102	85	72	100	82	69	97	79	66	94	76	64	88	72	61	83	67	57	79	64	53	75	61	50	72	59	57	69	55	54
		7-27	102	97	82	102	93	78	102	89	75	102	86	73	102	83	70	100	80	68	97	77	66	91	73	62	86	69	59	82	65	55	78	62	52	75	60	59	72	57	56
		27-45	103	103	103	102	102	102	99	99	99	97	96	96	94	93	93	92	90	90	89	87	87	84	82	82	79	78	78	74	74	74	69	69	69	65	65	65	62	62	62
D	0-7	102	90	76	102	86	73	101	83	69	97	79	67	94	76	64	91	74	62	88	71	60	83	67	57	78	63	52	74	60	59	71	57	56	68	54	53	65	51	50	
	7-27	102	91	77	102	87	74	102	84	71	101	80	68	97	78	66	94	75	64	91	73	62	86	68	59	81	65	54	77	62	51	74	59	58	71	55	55	68	52	52	
	27-45	101	101	101	98	98	98	95	94	94	92	90	90	90	87	87	84	84	84	82	82	78	77	77	72	72	72	68	68	68	64	64	64	60	60	60	57	57	57		
10	B	0-7	91	91	91	91	91	91	91	87	91	91	83	91	91	80	91	91	77	91	88	74	91	82	69	91	77	65	90	73	62	86	69	59	82	66	56	78	63	53	
		7-27	91	91	91	91	91	89	91	91	86	91	91	83	91	91	80	91	91	77	91	88	75	91	83	70	91	78	66	91	74	63	89	71	61	85	67	58	81	65	55
		27-45	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	101	101	101	99	99	99	94	93	90	88	88	86	84	84	81	80	80	77	76	76	73	73	73	
	C	0-7	91	91	82	91	91	78	91	89	75	91	85	72	91	82	69	91	79	66	91	76	64	88	72	61	83	67	57	79	64	53	75	61	50	72	59	57	69	55	54
		7-27	91	91	82	91	91	78	91	89	75	91	86	73	91	83	70	91	80	68	91	77	66	91	73	62	86	69	59	82	65	55	78	62	52	75	60	59	72	57	56
		27-45	102	102	102	102	102	99	99	99	97	96	96	94	93	93	92	90	90	89	87	87	84	82	82	79	78	78	74	74	74	69	69	69	65	65	65	62	62	62	
D	0-7	91	90	76	91	86	73	91	83	69	91	79	67	91	76	64	91	74	62	88	71	60	83	67	57	78	63	52	74	60	59	71	57	56	68	54	53	65	51	50	
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	27-45	101	101	101	98	98	98	95	94	94	92	90	90	90	87	87	84	84	84	82	82	78	77	77	72	72	72	68	68	68	64	64	60	60	60	57	57	57			
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		7-27	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	75	78	78	70	78	78	66	78	74	63	77	71	61	75	67	58	73	65	55	
		27-45	96	96	96	96	96	96	96	96	96	96	96	96	96	96	94	94	94	93	93	90	90	88	88	88	88	84	84	84	81	80	80	77	76	76	73	73	73		
	C	0-7	78	78	78	78	78	78	78	78	75	78	78	72	78	69	78	66	78	66	78	76	64	78	72	61	78	67	57	78	64	53	75	61	50	72	59	57	69	55	54
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		27-45	96	96	96	95	95	95	93	93	93	92	92	92	90	90	89	89	89	87	87	87	83	82	82	79	78	78	74	74	74	69	69	69	65	65	65	62	62	62	
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	27-45	95	95	95	93	93	93	91	91	91	90	90	88	87	87	86	84	84	82	82	78	77	77	72	72	72	68	68	68	64	64	60	60	60	57	57	57				
30	B	0-7	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	69	77	65	77	73	62	77	69	59	77	66	56	77	63	53			
		7-27	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	75	78	78	70	78	78	66	78	74	63	77	71	61	75	67	58	73	65	55	
		27-45	90	90	90	90	90	90	90	90	90	90	90	90	90	90	89	89	88	88	88	85	85	85	82	82	82	79	79	79	76	76	73	73	73	70	70	70			
	C	0-7	77	77	77	77	77	77	77	77	75	77	77	72	77	69	77	66	77	66	77	64	77	72	61	77	67	57	77	64	53	75	61	50	72	59	57	69	55	54	
		7-27	78	78	78	78	78	78	78	78	75	78	78	73	78	78	78	68	78	77	66	78	73	62	76	69	59	74	65	55	72	62	52	70	60	59	68	57	56		
		27-45	90	90	90	90	90	90	88	88	88	87	87	87	85	85	85	83	83	83	81	81	81	78	78	78	74	74	74	71	71	68	68	65	65	65	62	62	62		
D	0-7	78	78	76	78	78	73	78	69	78	67	78	76	64	78	74	62	78	71	60	78	67	57	78	63	52	74	60	59	71	57	56	68	54	53	65	51	50			
	7-27	78	78	77	78	78	74	78	78	71	78	68	78	78	66	78	75	64	78	73	62	75	68	59	73	65	54	71	62	51	69	59	58	67	55	55	65	52	52		
	27-45	90	90	90	89	89	89	87	87	87	85	85	85	83	83	83	81	81	81	79	79	79	75	75	75	71	71	71	68	68	68	64	64	60	60	60	57	57	57		
40	B	0-7	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	69	70	65	70	65	70	62	70	69	59	70	66	56	70	63	53			
		7-27	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	70	72	72	66	72	72	63	70	61	69	67	58	65	55			
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	84	84	83	83	83	80	80	80	77	77	77	75	75	72	72	70	70	70	67	67	67			
	C	0-7	70	70	70	70	70	70	70	70	70	70	70	70	70	69	70	66	70	64	70	64	70	61	70	67	57	70	64	53	70	61	50	69	59	57	68	55	54		
		7-27</																																							



ASCE 7-10
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

18.66 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

L-Foot
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)	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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
60	B	0-7	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	



30 ft
Roof Height

22.78 sq.ft
Module Area

CROSS-SLOPE
Rail Direction

NXT COMBO

L-Foot
Attachment

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)	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	79	79	76	79	79	73	79	79	70	79	78	67	79	75	65	79	72	62	79	70	60	79	66	55	75	62	51	71	59	46	68	55	40	65	51	34	62	48	45	
		7-27	79	79	74	79	79	71	79	79	68	79	78	66	79	75	64	79	73	62	79	70	60	79	66	55	78	63	51	74	60	47	70	56	43	67	52	37	65	49	47	
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	77	77	74	74	74	69	69	69	65	65	61	61	61	67	58	58	58	54	54	52	52	52	
	C	0-7	79	77	66	79	74	63	79	71	61	79	68	59	79	66	55	77	63	52	74	61	50	70	57	45	66	53	36	63	49	46	60	45	41	57	39	36	54	34	32	
		7-27	79	77	65	79	74	63	79	71	60	79	68	58	79	66	55	79	64	52	77	62	50	72	58	46	69	54	39	65	50	34	62	46	44	60	41	39	57	36	35	
		27-45	80	80	80	79	79	79	75	75	75	72	72	72	69	69	69	67	67	67	64	64	64	60	60	60	56	56	56	52	52	52	52	49	49	46	46	44	44	44		
	D	0-7	79	72	62	79	69	59	79	66	56	77	64	53	74	61	50	72	59	47	70	57	44	66	52	35	62	48	45	59	43	40	56	36	35	52	47	91	49	43	27	
		7-27	79	72	61	79	69	59	79	67	56	79	64	53	77	62	50	75	60	48	72	58	46	68	53	38	65	49	47	61	45	43	59	39	37	55	34	93	52	45	29	
		27-45	77	77	77	73	73	73	70	70	67	67	67	64	64	64	62	62	62	59	59	59	55	55	55	51	51	48	48	48	45	45	45	43	43	43	40	40	40	40		
10	B	0-7	66	66	66	66	66	66	66	66	66	66	66	66	66	65	66	66	62	66	66	60	66	66	55	66	62	66	66	60	66	60	47	65	56	43	63	52	37	61	49	47
		7-27	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	60	66	66	55	66	63	51	66	60	47	65	56	43	63	52	37	61	49	47	
		27-45	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	77	77	74	74	74	69	69	69	65	65	61	61	61	67	58	58	58	54	54	52	52	52
	C	0-7	66	66	66	66	66	63	66	66	61	66	66	59	66	66	55	66	63	52	66	61	50	66	57	45	66	53	36	63	49	46	60	45	41	57	39	36	54	34	32	
		7-27	66	66	65	66	66	63	66	66	60	66	66	58	66	66	55	66	64	52	66	62	50	66	58	46	64	54	39	62	50	34	60	46	44	58	41	39	56	36	35	
		27-45	79	79	79	78	78	78	75	75	75	72	72	72	69	69	69	67	67	67	64	64	64	60	60	60	56	56	56	52	52	52	52	49	49	46	46	44	44	44		
	D	0-7	66	66	62	66	66	59	66	66	56	66	64	53	66	61	50	66	59	47	66	57	44	66	52	35	62	48	45	59	43	40	56	36	35	52	47	91	49	43	27	
		7-27	66	66	61	66	66	59	66	66	56	66	64	53	66	62	50	66	60	48	66	58	46	64	53	38	61	49	47	59	45	43	57	39	37	55	34	93	52	45	29	
		27-45	77	77	77	73	73	73	70	70	67	67	67	64	64	64	62	62	62	59	59	59	55	55	55	51	51	48	48	48	45	45	45	43	43	43	40	40	40	40		
20	B	0-7	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
		27-45	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	69	69	68	68	68	65	65	65	62	62	60	60	60	60	60	60	60	60	60	60	60	60
	C	0-7	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	50	55	55	45	55	53	36	55	49	46	60	45	41	54	39	36	53	34	32	
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	50	55	55	46	54	54	39	52	50	34	51	46	44	50	41	39	48	36	35	
		27-45	71	71	71	70	70	70	68	68	67	67	67	65	65	65	65	65	65	63	63	63	62	62	62	59	59	59	56	56	56	52	52	52	52	49	49	46	46	44	44	44
	D	0-7	55	55	55	55	55	55	55	55	55	55	53	55	55	55	55	55	55	47	55	55	44	55	52	35	45	55	48	45	55	43	40	54	36	35	52	47	91	49	43	27
		7-27	55	55	55	55	55	55	55	55	55	55	53	55	55	55	55	55	55	48	55	55	46	54	53	38	52	49	47	51	45	43	49	39	37	48	34	93	46	45	29	
		27-45	70	70	70	68	68	68	66	66	66	64	64	64	63	63	63	61	61	61	59	59	59	59	59	55	55	51	51	51	48	48	48	45	45	45	43	43	43	40	40	40
30	B	0-7	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
		27-45	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
	C	0-7	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
		27-45	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
	D	0-7	55	55	55	55	55	55	55	55	55	55	55	53	55	55	55	55	55	47	55	55	44	55	52	35	45	55	48	45	55	43	40	54	36	35	52	47	91	49	43	27
		7-27	55	55	55	55	55	55	55	55	55	55	53	55	55	55	55	55	55	48	55	55	46	54	53	38	52	49	47	51	45	43	49	39	37	48	34	93	46	45	29	
		27-45	65	65	65	64	64	64	62	62	62	60	60	60	59	59	59	57	57	57	56	56	56	53	53	53	51	51	51	48	48	48	45	45	45	43	43	43	40	40	40	40
40	B	0-7	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	
		7-27	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
		27-45	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*
	C	0-7	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
		7-27	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									

* 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.

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.



• 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.

~~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.



ASCE 7-10
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

22.78 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

L-Foot
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)	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	101	101	95	101	101	91	101	101	86	101	98	82	101	94	79	101	90	76	101	87	73	99	81	68	94	77	64	89	72	61	85	69	59	81	66	55	78	63	52				
		7-27	102	102	92	102	102	89	102	102	85	102	98	82	102	94	79	102	91	76	102	88	74	102	82	70	98	78	66	93	74	63	88	70	60	84	67	57	81	64	54				
		27-45	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	100	100	100	98	98	98	94	92	92	90	87	87	85	83	83	80	79	79	76	76	72	72	72					
	C	0-7	101	96	81	101	92	78	101	88	74	101	84	71	99	81	68	96	78	66	93	76	64	87	71	60	83	67	57	79	64	53	75	61	60	72	58	57	69	55	54				
		7-27	102	97	81	102	92	78	102	89	75	102	85	72	102	82	70	100	79	67	96	77	65	91	72	62	86	68	59	82	65	55	78	62	61	74	59	59	71	56	56				
		27-45	103	103	103	102	102	102	99	99	99	96	96	96	93	92	92	91	89	89	86	86	83	81	81	78	77	77	73	73	73	68	68	68	64	64	64	61	61	61					
D	0-7	101	90	75	101	86	72	100	82	69	96	79	66	93	76	64	90	73	62	87	71	60	82	66	56	78	63	52	74	60	59	70	57	55	67	53	52	65	61	49					
	7-27	102	90	76	102	86	73	102	83	70	100	80	68	97	77	65	93	74	63	90	72	62	85	68	58	81	64	54	77	61	60	73	58	58	70	55	54	67	62	51					
	27-45	100	100	100	97	97	97	94	93	93	91	90	90	89	87	87	86	84	84	83	81	81	77	77	72	72	72	72	67	67	67	63	63	63	59	59	59	56	56	56					
10	B	0-7	90	90	90	90	90	90	90	90	86	90	90	82	90	90	79	90	90	76	90	87	73	90	81	68	90	77	64	89	72	61	85	69	59	81	66	55	78	63	52				
		7-27	91	91	91	91	91	89	91	91	85	91	91	82	91	91	79	91	91	76	91	88	74	91	82	70	91	78	66	91	74	63	88	70	60	84	67	57	81	64	54				
		27-45	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	100	100	100	98	98	98	94	92	92	90	87	87	85	83	83	80	79	79	76	76	72	72	72					
	C	0-7	90	90	81	90	90	78	90	88	74	90	84	71	90	81	68	90	78	66	90	76	64	87	71	60	83	67	57	79	64	53	75	61	60	72	58	57	69	55	54				
		7-27	91	91	81	91	91	78	91	89	75	91	85	72	91	82	70	91	79	67	91	77	65	91	72	62	86	68	59	82	65	55	78	62	61	74	59	59	71	56	56				
		27-45	101	101	101	101	101	101	99	99	99	96	96	96	93	92	92	91	89	89	86	86	83	81	81	78	77	77	73	73	73	68	68	68	64	64	64	61	61	61					
D	0-7	90	90	75	90	86	72	90	82	69	90	79	66	90	76	64	90	73	62	87	71	60	82	66	56	78	63	52	74	60	59	70	57	55	67	53	52	65	61	49					
	7-27	91	90	76	91	86	73	91	83	70	91	80	68	91	77	65	91	74	63	90	72	62	85	68	58	81	64	54	77	61	60	73	58	58	70	55	54	67	62	51					
	27-45	100	100	100	97	97	97	94	93	93	91	90	90	89	87	87	86	84	84	83	81	81	77	77	72	72	72	72	67	67	67	63	63	63	59	59	59	56	56	56					
20	B	0-7	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	73	77	77	68	77	77	64	77	72	61	77	69	59	77	66	55	77	63	52						
		7-27	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	74	77	77	70	77	77	66	77	74	63	76	70	60	74	67	57	72	64	54						
		27-45	95	95	95	95	95	95	95	95	95	95	95	95	95	95	94	94	94	92	92	92	89	89	87	87	87	83	83	83	80	79	79	76	76	76	72	72	72						
	C	0-7	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	76	77	77	68	77	77	64	77	72	62	75	68	59	73	65	55	71	62	61	69	59	59	67	56	56
		7-27	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77					
		27-45	95	95	95	94	94	94	93	93	93	91	91	91	89	89	89	88	88	86	86	86	82	81	81	78	77	77	73	73	73	68	68	68	64	64	64	61	61	61					
D	0-7	77	77	75	77	77	72	77	69	77	77	66	77	76	64	77	73	62	77	71	60	77	66	56	77	63	52	74	60	59	70	57	55	67	53	52	65	61	49						
	7-27	77	77	76	77	77	73	77	77	70	77	77	68	77	77	65	77	74	63	77	72	62	74	68	58	72	64	54	70	61	60	68	58	58	66	55	54	64	62	51					
	27-45	94	94	94	93	93	93	91	91	89	89	87	87	87	85	84	84	83	81	81	77	77	77	72	72	72	72	67	67	67	63	63	63	59	59	59	56	56	56						
30	B	0-7	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	68	76	76	64	76	72	62	76	69	59	76	66	55	76	63	52						
		7-27	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77					
		27-45	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					
	C	0-7	76	76	76	76	76	76	76	76	76	76	76	71	76	76	68	76	76	66	76	76	64	76	71	60	76	67	57	76	64	53	75	61	60	72	58	57	69	55	54				
		7-27	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77					
		27-45	90	90	90	89	89	89	88	88	88	86	86	86	84	84	84	82	82	80	80	80	78	78	74	74	74	73	73	73	70	70	70	67	67	67	64	64	64	61	61	61			
D	0-7	77	77	75	77	77	72	77	69	77	77	66	77	76	64	77	73	62	77	71	60	77	66	56	77	63	52	74	60	59	70	57	55	67	53	52	65	61	49						
	7-27	77	77	76	77	77	73	77	77	70	77	77	68	77	77	65	77	74	63	77	72	62	74	68	58	72	64	54	70	61	60	68	58	58	66	55	54	64	62	51					
	27-45	90	90	90	88	88	88	86	86	86	84	84	84	82	82	82	80	80	80	78	78	78	74	74	74	74	71	71	71	67	67	67	63	63	63	59	59	59	56	56	56				
40	B	0-7	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					
		7-27	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					
		27-45	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85					
	C	0-7	69	69	69	69	69	69	69	69	69	69	69	69	69</																														



30 ft
Roof Height

22.78 sq.ft
Module Area

CROSS-SLOPE
Rail Direction

NXT COMBO
Clamp

L-Foot

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

[illegible]

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

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

~~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.



30 ft
Roof Height

Ss = 3.00
Seismic

18.66 sq.ft

ORIENTATION

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO

L-Foot
Attachment

SPAN TABLES

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	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			
			Roof Wind Zone																																						
0	B	0-7	86	86	80	86	86	76	86	85	73	86	82	70	86	79	68	86	76	65	86	74	63	84	69	59	79	65	54	75	62	50	72	59	46	69	55	41	66	52	36
		7-27	86	86	78	86	86	75	86	85	72	86	82	70	86	79	67	86	77	65	86	74	63	86	70	59	82	66	55	78	63	51	75	60	48	71	57	44	68	53	39
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	84	84	81	81	81	76	76	76	76	71	71	71	67	67	67	63	63	63	59	59	56	56	56	
	C	0-7	86	81	69	86	77	66	86	74	64	86	72	61	84	69	59	81	67	56	79	65	53	74	61	49	70	57	43	67	53	37	64	49	47	61	46	44	58	40	39
		7-27	86	81	69	86	78	66	86	75	64	86	72	61	86	70	59	84	67	57	81	65	54	77	62	50	73	58	46	69	54	40	66	50	35	63	47	46	61	43	42
		27-45	87	87	87	86	86	86	82	82	82	79	79	79	76	76	76	73	73	70	70	70	65	65	65	61	61	61	57	57	57	54	54	54	51	51	51	48	48	48	
	D	0-7	86	76	65	86	72	62	85	70	60	82	67	57	79	65	54	76	63	51	74	61	48	70	56	42	66	52	36	63	48	46	60	44	41	57	38	37	53	34	35
		7-27	86	76	65	86	73	62	86	70	60	85	68	57	82	66	55	79	63	52	77	61	50	72	58	45	68	53	39	65	49	34	62	46	45	59	41	39	56	36	35
		27-45	84	84	84	80	80	80	76	76	76	73	73	73	70	70	70	67	67	67	65	65	65	60	60	60	56	56	56	53	53	53	49	49	49	47	47	44	44	44	
10	B	0-7	72	72	72	72	72	72	72	72	72	72	72	72	72	68	72	65	72	62	63	72	69	59	72	65	54	72	62	50	72	59	46	69	55	41	66	52	36		
		7-27	72	72	72	72	72	72	72	72	72	72	72	72	72	72	68	72	65	72	62	63	72	69	59	72	66	55	72	63	51	71	60	48	69	57	44	67	53	39	
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	84	81	81	81	76	76	76	71	71	71	67	67	67	63	63	63	59	59	56	56	56	
	C	0-7	72	72	69	72	72	66	72	72	64	72	72	61	72	69	59	72	67	56	72	65	53	72	61	49	70	57	43												

* 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)

[illegible]

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

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

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.



ASCE 7-10
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

18.66 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

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



30 ft
Roof Height

Ss = 3.00
Seismic

18.66 sq.ft

LANDSCAPE

CROSS-SLOPE
Rail Direction

NXT

NXT COMBO

L-Foot

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

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

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.



ASCE 7-10
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

22.78 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

L-Foot
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)	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	79	79	76	79	79	73	79	79	70	79	78	67	79	75	65	79	72	62	79	70	60	79	66	55	75	62	51	71	59	46	68	55	40	65	51	34	62	48	45
		7-27	79	79	74	79	79	71	79	79	68	79	78	66	79	75	64	79	73	62	79	70	60	79	66	55	78	63	51	74	60	47	70	56	43	67	52	37	65	49	47
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	77	77	74	74	74	69	69	69	65	65	61	61	61	58	58	58	54	54	52	52	52	
	C	0-7	79	77	66	79	74	63	79	71	61	79	68	59	79	66	55	77	63	52	74	61	50	70	57	45	66	53	36	63	49	46	60	45	41	57	39	36	54	34	32
		7-27	79	77	65	79	74	63	79	71	60	79	68	58	79	66	55	79	64	52	77	62	50	72	58	46	69	54	39	65	50	34	62	46	44	60	41	39	57	36	35
		27-45	80	80	80	79	79	79	75	75	75	72	72	72	69	69	69	67	67	67	64	64	64	60	60	60	56	56	56	52	52	52	49	49	46	46	46	44	44	44	
D	0-7	79	72	62	79	69	59	79	66	56	77	64	53	74	61	50	72	59	47	70	57	44	66	52	35	62	48	45	59	43	40	56	36	35	52	47	31	49	43	27	
	7-27	79	72	61	79	69	59	79	67	56	79	64	53	77	62	50	75	60	48	72	58	46	68	53	38	65	49	47	61	45	43	59	39	37	55	34	39	52	45	29	
	27-45	77	77	77	73	73	73	70	70	70	67	67	67	64	64	64	62	62	62	59	59	59	55	55	55	51	51	51	48	48	48	45	45	45	43	43	43	40	40	40	
10	B	0-7	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	66	66	62	66	66	60	66	66	55	66	62	51	66	59	46	66	55	40	65	51	34	62	48	45
		7-27	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	62	66	66	60	66	66	55	66	63	51	66	60	47	65	56	43	63	52	37	61	49	47
		27-45	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	77	77	74	74	74	69	69	69	65	65	61	61	61	58	58	58	54	54	52	52	52	
	C	0-7	66	66	66	66	66	63	66	66	61	66	66	59	66	66	55	66	63	52	66	61	50	66	57	45	66	53	36	63	49	46	60	45	41	57	39	36	54	34	32
		7-27	66	66	65	66	66	63	66	66	60	66	66	58	66	66	55	66	64	52	66	62	50	66	58	46	64	54	39	62	50	34	60	46	44	58	41	39	56	36	35
		27-45	79	79	79	78	78	78	75	75	75	72	72	72	69	69	69	67	67	67	64	64	64	60	60	60	56	56	56	52	52	52	49	49	46	46	46	46	44	44	44
D	0-7	66	66	62	66	66	59	66	56	66	64	53	66	61	50	66	59	47	66	57	44	66	52	35	62	48	45	59	43	40	56	36	35	52	47	31	49	43	27		
	7-27	66	66	61	66	66	59	66	56	66	64	53	66	62	50	66	60	48	66	58	46	64	53	38	61	49	47	59	45	43	57	39	37	55	34	39	52	45	29		
	27-45	77	77	77	73	73	73	70	70	70	67	67	67	64	64	64	62	62	62	59	59	59	55	55	55	51	51	51	48	48	48	45	45	45	43	43	43	40	40	40	
20	B	0-7	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	46	55	55	40	55	51	34	55	48	45
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	47	54	54	43	53	52	37	52	49	47
		27-45	71	71	71	71	71	71	71	71	71	71	71	71	71	69	69	69	68	68	68	65	65	65	65	65	65	62	62	60	60	60	57	57	54	54	54	52	52	52	
	C	0-7	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	50	55	55	45	55	53	36	55	49	46	55	45	41	54	39	36	53	34	32	
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	
		27-45	71	71	71	70	70	70	68	68	68	67	67	67	65	65	65	63	63	63	62	62	62	59	59	59	56	56	56	52	52	49	49	46	46	46	46	46	44	44	44
D	0-7	55	55	55	55	55	55	55	55	55	55	53	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55		
	7-27	55	55	55	55	55	55	55	55	55	55	53	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55		
	27-45	70	70	70	68	68	68	66	66	66	64	64	64	63	63	63	61	61	61	59	59	59	55	55	55	51	51	51	48	48	48	45	45	45	43	43	43	40	40	40	
30	B	0-7	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	46	54	54	44	54	51	34	54	48	45
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	
		27-45	65	65	65	65	65	65	65	65	65	65	65	65	65																										



• 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.

~~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.



ASCE 7-10
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

22.78 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

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



ASCE 7-10
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

22.78 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

L-Foot
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)	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
			90			95			100			105			110			115			120			130			140			150			160			170			180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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