

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 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- 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 7-16, 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

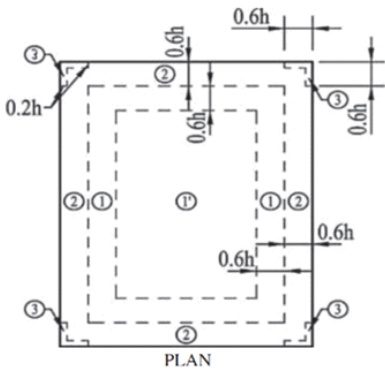
Seismic Design Assumptions

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

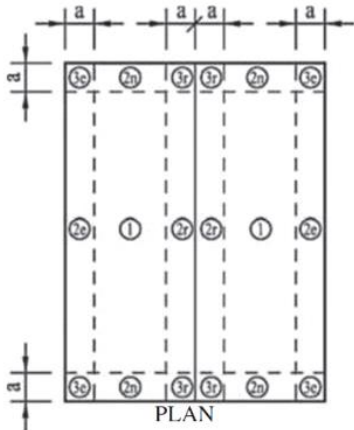
Array Assumptions

- 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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.

Zone should be considered as per ASCE 7-16, Fig. 30.3-2A to 30.3-2D



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



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

Grouping of ASCE 7-16 Roof Zones (Gable and Flat)

- **Roof Tilt 0° - 7°**
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3
- **Roof Tilt 7° - 27°**
Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r
- **Roof Tilt 27° - 45°**
Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e

Rails can be installed in these possible orientations.

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

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	34	34	34	34	34	34	30	34	34	27	34	34	24	34	32	22	34	29	20	34	26	18	31	22	15	26	18	13	22	16	11	19	14	10	17	12	8	15	11	7					
			Exposed	34	31	22	34	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	5	10	7	7						
		Exposed	34	23	19	32	21	17	29	18	15	26	17	14	23	15	12	21	14	11	19	12	10	16	10	9	14	9	7	12	8	6	10	7	5	9	6	7	8	6								
		Exposed	34	28	20	34	24	25	17	34	22	15	34	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	6						
		Exposed	35	35	25	35	35	32	28	19	28	25	17	26	23	15	23	21	14	21	19	12	18	16	10	15	14	8	13	12	7	11	10	6	10	9	5	9	8									
		Exposed	30	22	15	27	19	13	24	17	12	21	15	11	19	14	10	18	13	9	16	11	8	13	10	7	11	8	6	10	7	11	9	15	10	8	13	8	5	7								
	Exposed	34	31	22	34	27	19	34	24	16	34	22	15	34	20	13	31	18	12	28	16	11	24	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4								
	10	D	0-7	Interior	34	30	23	30	17	12	27	16	10	24	14	9	22	13	8	20	11	8	18	10	7	15	9	6	13	7																		

* 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.

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.

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

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																	
				90												95												100														105											
				110												115												120														130											
				Roof Wind Zone																																																	
0	B	0-7	Interior	56	56	56	56	56	51	56	56	46	56	56	41	56	54	37	56	48	34	56	44	31	52	37	26	44	31	22	38	27	19	33	23	16	29	21	14	25	18	13											
			Exposed	56	53	37	56	47	33	56	42	29	53	38	26	48	34	24	43	31	22	39	28	20	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	12	13											
		7-20	Interior	56	56	51	56	55	45	56	49	40	56	44	36	56	40	32	56	36	29	51	33	27	43	28	23	36	23	19	31	20	17	27	18	14	24	15	13	21	14	11											
			Exposed	56	39	32	55	35	29	49	31	26	44	28	23	40	25	21	36	23	19	33	21	17	28	18	15	23	15	12	20	13	11	18	11	9	15	10	13	14	14	11											
		20-27	Interior	57	57	57	57	57	51	57	57	44	57	53	38	57	48	34	57	44	30	57	40	27	57	33	23	50	28	19	43	25	17	37	21	14	32	19	13	29	17	11											
			Exposed	57	48	33	57	43	29	57	38	26	57	34	23	54	31	21	49	28	19	45	26	17	37	22	15	32	18	12	27	16	11	24	14	9	21	12	8	19	11	7											
	C	0-7	Interior	56	56	40	56	51	35	56	45	32	56	41	28	51	37	26	47	33	23	42	30	21	35	26	18	30	22	15	26	19	13	23	16	11	20	14	10	18	13	14											
			Exposed	51	37	26	45	32	23	40	29	20	36	26	18	33	24	17	30	21	15	27	20	14	23	17	12	19	14	10	17	12	13	15	11	11	13	9	10	11	13	9											
		7-20	Interior	56	42	35	56	38	31	53	34	28	47	30	25	43	27	23	39	25	20	35	23	19	30	19	16	25	16	13	22	14	12	19	12	10	17	11	14	15	10	12											
			Exposed	42	27	22	38	24	20	34	22	18	30	20	16	27	18	15	25	16	13	23	15	12	19	12	10	16	11	13	14	9	11	12	12	10	11	11	9	10	9	8											
		20-27	Interior	57	52	37	57	46	31	57	41	28	57	37	25	57	33	22	53	30	20	48	28	19	40	23	16	34	20	13	30	17	12	26	15	10	23	13	9	20	12	8											
			Exposed	57	33	22	52	29	20	46	26	18	41	24	16	37	21	15	34	20	13	31	18	12	26	15	10	22	13	9	19	11	7	17	10	10	15	13	9	13	11	8											
	D	0-7	Interior	58	58	47	58	57	41	58	51	36	52	46	31	47	42	28	42	38	25	39	35	22	33	29	18	28	25	15	24	21	13	21	19	11	18	16	10	16	15	9											
			Exposed	46	41	28	41	37	24	37	33	21	33	30	19	30	27	17	27	25	15	25	22	14	21	19	11	18	16	10	16	14	8	14	12	7	12	11	10	11	9	9											
		7-20	Interior	56	48	33	56	42	29	53	38	26	47	34	24	43	31	21	39	28	19	35	25	18	30	21	15	25	18	13	22	16	11	19	14	10	17	12	13	15	11	11											
			Exposed	42	30	21	38	27	19	34	24	17	30	22	15	27	20	14	25	18	13	23	16	11	19	14	10	16	12	13	14	10	11	12	13	9	11	12	8	9	11	7											
		20-27	Interior	55	35	29	49	31	26	44	28	23	39	25	21	35	23	19	32	21	17	29	19	16	25	16	13	21	14	11	18	12	10	16	10	13	14	9	11	12	12	10											
			Exposed	35	23	19	31	20	17	28	18	15	25	16	13	23	15	12	21	13	11	19	12	10	16	10	13	14	13	11	12	12	10	10	8	14	9	7	12	8	6												
10	B	0-7	Interior	57	43	29	57	38	26	57	34	23	54	31	21	48	28	19	44	25	17	40	23	16	34	19	13	29	17	11	25	14	10	21	12	8	19	11	7	17	10	10											
			Exposed	48	28	19	43	25	17	38	22	15	34	20	13	31	18	12	28	16	11	26	15	10	22	13	9	19	11	7	16	9	10	14	12	8	12	11	7	11	10	6											
		7-20	Interior	58	54	38	54	48	33	48	43	29	43	38	25	39	35	23	35	32	20	32	29	18	27	24	15	23	21	13	20	18	11	18	16	10	15	14	8	14	12	7											
			Exposed	39	35	23	34	31	20	31	28	17	28	25	15	25	23	14	23	21	12	21	19	11	18	16	10	15	14	8	13	12	7	11	10	9	10	14	8	14	12	7											
		20-27	Interior	40	40	40	40	40	35	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	37	26	40	31	22	38	27	19	33	23	16	29	21	14	25	18	13											
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	32	40	40	33	27	40	33	27	40	28	23	36	23	19	31	20	17	27	18	14	24	15	13	21	14	11						
	C	0-7	Interior	52	52	52	52	52	51	52	52	44	52	52	38	52	48	34	52	44	30	52	40	27	52	33	23	50	28	19	43	25	17	37	21	14	32	19	13	29	17	11											
			Exposed	52	48	33	52	43	29	52	38	26	52	34	23	52	31	21	49	28	19	45	26	17	37	22	15	32	18	12	27	16	11	24	14	9	21	12	8	19	11	7											
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	34	47	42	28	40	36	23	34	31	20	30	27	17	26	24	14	23	21	13												
			Exposed	56	56	43	56	53	37	53	48	33	48	43	29	43	38	25	39	35	23	36	32	21	30	27	17	26	23	14	22	20	12	19	17	11	17	15	9	15	14	8											
		20-27	Interior	40	40	40	40	40	35	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	37	26	40	31	22	38	27	19	33	23	16	29	21	14	25	18	13											
			Exposed	40	37	26	40	32	23	40	29	20	36	26	18	33	24	17	30	21	15	27	20	14	23	17	12	19	14	10	17	12	13	15	11	11	13	9	10	11	13	9											
	D	0-7	Interior	40	40	35	40	38	31	40	34	28	40	30	25	40	27	23	39	25	20	35	23	19	30																												

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



ASCE 7-16
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

23 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

SM
Rail Type

PRO SERIES
Clamp

Flashloc DUO OSB
Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																								
				90						95						100						105						110																
				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											
0	B	0-7	Interior	28	28	28	28	28	25	28	28	23	28	28	20	28	26	18	28	24	17	28	22	15	25	18	13	22	15	11	18	13	9	16	11	8	14	10	7	12	9	6	6	
			Exposed	28	26	18	28	23	16	28	21	14	26	19	13	23	17	12	21	15	11	19	14	10	16	12	8	14	10	7	12	8	6	10	7	8	9	6	7	8	6	6		
		7-20	Interior	28	28	25	28	27	22	28	24	20	28	22	18	28	19	16	28	18	14	25	16	13	21	13	11	18	11	9	15	10	8	13	9	7	12	7	6	10	7	5		
			Exposed	28	19	16	27	17	14	24	15	13	22	14	11	19	12	10	18	11	9	16	10	8	13	9	7	11	7	6	10	6	5	9	5	7	7	6	7	7	5			
		20-27	Interior	29	29	29	29	29	25	29	29	22	29	26	19	29	24	16	29	22	15	29	20	13	29	16	11	25	14	9	21	12	8	18	10	7	16	9	6	14	8	5		
			Exposed	29	24	16	29	21	14	29	19	13	29	17	11	27	15	10	24	14	9	22	13	8	18	11	7	16	9	6	13	8	5	12	7	4	10	6	6	9	5	5		
	27-45	Interior	29	29	29	29	29	29	29	29	29	27	29	29	24	29	29	21	29	27	19	28	25	17	23	21	14	20	18	11	15	10	15	13	8	13	12	7	11	10	6	6		
		Exposed	29	29	21	29	26	18	26	23	16	24	21	14	21	19	13	19	17	11	18	16	10	15	13	8	13	11	7	11	10	6	9	8	5	8	7	4	7	7	4	4		
	C	0-7	Interior	28	28	20	28	25	17	28	22	15	28	20	14	25	18	13	23	16	11	21	15	10	17	12	9	15	11	7	13	9	6	11	8	5	10	7	7	9	6	7		
			Exposed	25	18	12	22	16	11	20	14	10	18	13	9	16	12	8	15	10	7	13	10	7	11	8	6	9	7	7	8	6	7	8	5	6	7	5	5	6	4	4		
		7-20	Interior	28	21	17	28	19	15	26	17	14	23	15	12	21	13	11	19	12	10	17	11	9	15	9	8	12	8	6	11	7	6	9	6	7	8	5	7	7	7	6		
			Exposed	21	13	11	19	12	10	17	11	9	15	10	8	13	9	7	12	8	6	11	7	6	9	6	8	8	6	7	7	6	6	6	6	5	8	5	4	7	4	4		
		20-27	Interior	29	25	18	29	23	15	29	20	14	29	18	12	29	16	11	26	15	10	24	14	9	20	11	8	17	10	6	14	8	6	13	7	5	11	6	4	10	6	6		
			Exposed	19	16	11	25	14	10	23	13	9	20	12	8	18	10	7	17	10	6	15	9	6	14	8	5	13	7	5	11	6	4	9	5	5	8	7	5	6	5	4		
	D	0-7	Interior	29	29	23	29	28	20	28	25	18	26	23	15	23	15	23	21	14	21	19	12	19	17	11	16	10	16	14	9	14	12	7	12	10	6	10	9	5	9	8	7	4
			Exposed	23	20	14	20	18	12	18	16	10	16	15	9	15	13	8	13	12	7	12	11	7	10	9	6	9	14	10	6	10	9	5	9	8	5	7	4	7	6	5		
		7-20	Interior	28	23	16	28	21	14	26	19	13	23	17	12	21	15	10	19	14	9	17	12	9	14	10	7	12	9	6	11	8	5	9	7	7	8	6	6	7	8	5	3	
			Exposed	27	17	14	24	15	13	22	14	11	19	12	10	17	11	9	16	10	8	14	9	8	12	8	6	10	7	5	9	6	7	8	8	6	7	7	5	6	6	5		
		20-27	Interior	17	11	9	15	10	8	14	9	7	12	8	6	11	7	6	10	6	5	9	6	7	8	6	7	7	5	9	6	6	6	6	5	8	8	6	4	4	3	3		
			Exposed	29	21	14	29	19	13	29	17	11	26	15	10	24	14	9	22	12	8	20	11	8	16	9	6	14	8	5	12	7	5	10	6	6	9	5	5	8	7	5		
10	B	0-7	Interior	24	14	9	21	12	8	19	11	7	17	10	6	15	9	6	14	8	5	13	7	5	11	6	6	9	5	5	8	7	6	4	6	5	8	5	8	5	3			
			Exposed	19	17	11	26	14	16	24	21	14	21	19	12	19	17	11	17	16	10	16	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	5		
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	20	18	20	14	20	18	14	20	16	13	20	13	11	18	11	9	15	10	8	13	9	7	12	7	6	10	7	5		
			Exposed	20	19	16	20	17	14	20	15	13	20	14	11	19	12	10	18	11	9	16	10	8	13	9	7	11	7	6	10	6	5	9	5	7	7	6	7	7	5			
		20-27	Interior	26	26	26	26	26	25	26	26	22	26	26	19	26	24	16	26	22	15	26	20	13	26	16	11	25	14	9	21	12	8	18	10	7	16	9	6	14	8	5		
			Exposed	26	24	16	26	21	14	26	19	13	26	17	11	26	15	10	24	14	9	22	13	8	18	11	7	16	9	6	13	8	5	12	7	4	10	6	6	9	5	5		
	C	0-7	Interior	28	28	28	28	28	28	28	28	27	28	28	24	28	28	21	28	27	19	28	25	17	23	21	14	20	18	11	17	15	10	15	13	8	13	12	7	11	10	6		
			Exposed	28	28	21	28	26	18	26	23	16	24	21	14	21	19	13	19	17	11	18	16	10	15	13	8	13	11	7	11	10	6	9	8	5	8	7	4	7	7	4		
		7-20	Interior	20	20	20	20	20	17	20	20	15	20	14	20	18	13	20	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	5	10	7	7	9	6	7			
			Exposed	20	18	12	20	16	11	20	14	10	18	13	9	16	12	8	15	10	7	13	10	7	11	8	6	9	7	7	8	6	7	8	5	6	7	5	5	6	4			
		20-27	Interior	20	20	17	20	19	15	20	17	14	20	15	12	20	13	11	19	12	10	17	11	9	15	9	8	12	8	6	11	7	6	9	6	7	8	5	7	7	7	6		
			Exposed	20	13	11	19	12	10	17	11	9	15	10	8	13	9	7	12	8	6	11	7	6	9	6	8	8	6	7	7	6	6	6	6	5	8	5	4	7	4	4		
20	B	0-7	Interior	26	25	18	26	23	15	26	20	14	26	18	12	26	16	11	26	15	10	24	14	9	20	11	8	17	10	6	14	8	6	13	7	5	11	6	4	10	6	6		
			Exposed	26	16	11	25	14	10	23	13	9	20	12	8	18	10	7	17	10	6	15	9	6	13	7	5	11	6	4	9	5	5	8	7	5	7	6	4	6	5	4		
		7-20	Interior	28	28	23	28	28	20	28	25	18	26	23	15	23	15	23	21	14	21	19	12	19	17	11	16	10	16	14	9	14	12	7	12	10	6	10	9	5	9	8	7	4
			Exposed	23	20	14	20	18	12	18	16	10	16	15	9	15	13	8	13	12	7	12	11	7	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.

	* Cells with an astrisks indicates that the L-foot must be oriented in the Y- direction as indicated in the image.
10	Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.
40	Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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

* Cells with an asterisk indicates that the L-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.



ASCE 7-16
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

19 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

SM
Rail Type

PRO SERIES
Clamp

Flashloc DUO OSB
Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																													
				90						95						100						105						110						115						120						130						140						150						160						170						180					
				Roof Wind Zone																																																																													
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																				
0	B	0-7	Interior	34	34	34	34	34	30	34	34	27	34	34	24	34	32	22	34	29	20	34	26	18	31	22	15	26	18	13	22	16	11	19	14	10	17	12	8	14	10	7	12	9	6	11	8	5	10	7	7																														
			Exposed	34	31	22	34	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	5	10	7	7	7	7	7	7	7	7	7	7																															
		7-20	Interior	34	34	30	34	32	26	34	29	24	34	26	21	34	23	19	33	21	17	30	19	16	25	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7	12	8	7	12	8	7	12	8	7																														
			Exposed	34	23	19	32	21	17	29	18	15	26	17	14	23	15	12	21	14	11	19	12	10	16	10	9	14	9	7	12	8	6	10	7	5	9	6	7	5	9	6	7	5	9	6	7	5	9	6																															
		20-27	Interior	34	34	34	34	34	30	34	34	26	34	32	23	34	28	20	34	26	17	34	23	16	34	20	13	29	17	11	25	14	10	22	13	8	19	11	7	17	10	7	17	10	7	17	10	7																																	
			Exposed	34	28	20	34	25	17	34	22	15	34	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	11	6	11	6	11	6	11																																	
	27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35																																	
		Exposed	35	35	25	35	32	22	32	28	19	28	25	17	26	23	15	23	21	14	21	19	12	18	16	10	15	14	8	13	12	7	11	10	6	10	9	5	9	8	5	9	8	5	9	8	5	9	8																																
	C	0-7	Interior	34	34	23	34	30	21	34	27	19	34	24	17	30	22	15	27	20	14	25	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	12	8	6	10	7	12	8	6																																
			Exposed	30	22	15	27	19	13	24	17	12	21	15	11	19	14	10	18	13	9	16	11	8	13	10	7	11	8	6	10	7	8	9	6	7	5	6	7	5	6	7	5	6	7	5	6																																		
		7-20	Interior	34	25	21	34	22	18	31	20	16	28	18	15	25	16	13	23	15	12	21	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	8	9	5	7	6	8	9	5	7	6																																	
			Exposed	25	16	13	22	14	12	20	13	10	18	11	9	16	10	9	15	8	13	9	7	11	7	6	10	6	8	5	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6																																	
		20-27	Interior	34	31	22	34	27	19	34	24	16	34	22	15	34	20	13	31	18	12	28	16	11	24	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4	10	7	4	10	7	4	10	7																															
			Exposed	34	20	13	30	17	12	27	16	10	24	14	9	22	13	8	20	11	8	18	10	7	15	9	6	13	7	5	11	6	4	10	6	6	9	8	5	8	7	4	10	6	7	4	10	6																																	
	27-45	Interior	35	35	28	35	34	24	34	30	21	31	27	19	28	25	16	25	22	15	23	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6	10	9	5	9	8	5	9	8	5	9	8																																
		Exposed	27	25	16	24	22	14	22	20	13	20	18	11	18	16	10	16	14	9	15	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	6	6	6	6	6	6	6	6	6	6																																		
	D	0-7	Interior	34	28	19	34	25	17	31	22	15	28	20	14	25	18	13	23	16	11	21	15	10	17	13	9	15	11	7	13	9	6	11	8	6	10	7	7	9	6	7	9	6	7	9	6	7																																	
			Exposed	25	18	12	22	16	11	20	14	10	18	13	9	16	12	8	15	10	7	13	10	7	11	8	6	10	7	7	8	6	6	7	8	5	6	7	5	6	7	5	6	7	5	6	7	5	6																																
7-20		Interior	33	21	17	29	18	15	26	17	14	23	15	12	21	13	11	19	12	10	17	11	9	15	9	8	12	8	7	11	7	6	9	6	7	8	8	7	7	8	7	7	8	7	7	8	7																																		
		Exposed	21	13	11	18	12	10	17	11	9	15	10	8	13	9	7	12	8	6	11	7	6	9	6	8	8	6	8	6	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6																																		
20-27		Interior	34	25	17	34	22	15	34	20	14	32	18	12	29	16	11	26	15	10	24	14	9	20	11	8	17	10	6	14	8	6	13	7	5	11	6	7	10	6	6	7	10	6	6	7	10	6																																	
		Exposed	28	16	11	25	14	10	23	13	9	20	12	8	18	11	7	17	10	6	15	9	6	13	7	5	11	6	6	9	5	6	8	7	5	7	6	4	6	6	6	4	6	6	4	6	6																																		
27-45	Interior	35	32	22	32	28	19	28	25	17	25	23	15	23	21	13	21	19	12	19	17	11	16	14	9	14	12	7	12	11	6	10	9	5	9	8	5	9	8	5	9	8	5	9	8	5	9	8																																	
	Exposed	23	20	13	20	18	12	18	16	10	16	15	9	15	13	8	14	12	7	12	11	7	10	9	6	9	8	5	8	7	4	7	6	5	6	6	6	6	6	6	6	6	6	6	6	6																																			
10	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	22	15	24	20	14	24	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	12	8	6	10	7	12	8	6																																
			Exposed	24	24	22	24	24	19	24	24	17	24	22	16	24	20	14	24	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	5	10	7	7	7	7	7	7	7	7	7																																
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	23	19	24	21	17	24	19	16	24	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7	12	8	7	12	8	7																																	
			Exposed	24	23	19	24	21	17	24	18	15	24	17	14	23	15	12	21	14	11	19	12	10	16	10	9	14	9	7	12	8	6	10	7	5	9	6	7	8	8	7	8	8	7	8	8	7																																	
		20-27	Interior	31	31	31	31	31	30	31	31	26	31	31	23	31	28	20	31	26	17	31	23	16	31	20	13	29	17	11	25	14	10	22	13	8	19	11	7	17	10	7	17	10	7	17	10	7																																	
			Exposed	31	28	20	31	25	17	31	22	15	31	20	14	31	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	11	6	11	6	11																																			
	27-45	Interior	34	34	34	34	34	34	34	34	33	34	34	29	34	34	26	34	32	23	33	29	20	28	25	17	24	21	14	20	18	12	18	16	10	14	8	14	12	7	14	12	7	14	12	7																																			
		Exposed	34	34	25	34	32	22	32	28	19	28	25	17	26	23	15	23	21	14	21	19	12	18	16	10	15	14	8	13	12	7	11	10	6	10	9	5	9	8	5	9	8	5	9	8																																			
	C	0-7	Interior	24	24	23	24	24	21	24	19	24	24	17	24	22	15	24	20	14	24	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	12	8	6	10	7	12	8	6																																	
			Exposed	24	22	15	24	19	13	24	17	12	21	15	11	19	14	10	18	13	9	16	11	8	13	10	7	11	8	6	10	7	8	9	6	7	5	6	7	5	6	7	5	6	7	5	6																																		
		7-20	Interior	24	24	21	24	22	18	24	20	16	24	18	15	24	16	13	23	15	12	21	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	8	9	5	7	6	8	9	5	7	6																																	
			Exposed	24	16	13	22	14	12	20	13	10	18	11	9	16	10	9	15	8	13	9	7	11	7	6	10	6	8	5	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6																																		
		20-27	Interior	31	31	22	31	27	19	31	24	16	31	22	15	31	20	13	31	18	12	28	16	11	24	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4	10	7	4	10	7																																		
			Exposed	31	20	13	30	17	12	27	16																																																																						

[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.

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.

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

[illegible]

* 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.



ASCE 7-16
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

23 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

SM
Rail Type

PRO SERIES
Clamp

Flashloc DUO OSB
Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				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	28	28	28	28	28	25	28	28	23	28	28	20	28	26	18	28	24	17	28	22	15	25	18	13	22	15	11	18	13	9	16	11	8	14	10	7	12	9	6
			Exposed	28	26	18	28	23	16	28	21	14	26	19	13	23	17	12	21	15	11	19	14	10	16	12	8	14	10	7	12	8	6	10	7	8	9	6	7	8	6	6
		7-20	Interior	28	28	25	28	27	22	28	24	20	28	22	18	28	19	16	28	18	14	25	16	13	21	13	11	18	11	9	15	10	8	13	9	7	12	7	6	10	7	5
			Exposed	28	19	16	27	17	14	24	15	13	22	14	11	19	12	10	18	11	9	16	10	8	13	9	7	11	7	6	10	6	5	9	5	7	7	6	7	7	5	
		20-27	Interior	29	29	29	29	29	25	29	29	22	29	26	19	29	24	16	29	22	15	29	20	13	29	16	11	25	14	9	21	12	8	18	10	7	16	9	6	14	8	5
			Exposed	29	24	16	29	21	14	29	19	13	29	17	11	27	15	10	24	14	9	22	13	8	18	11	7	16	9	6	13	8	5	12	7	4	10	6	6	9	5	5
	27-45	Interior	29	29	29	29	29	29	29	29	29	27	29	29	24	29	29	21	29	27	19	28	25	17	23	21	14	20	18	11	17	15	10	15	13	8	13	12	7	11	10	6
		Exposed	29	29	21	29	26	18	26	23	16	24	21	14	21	19	13	19	17	11	18	16	10	15	13	8	13	11	7	11	10	6	9	8	5	8	7	4	7	7	7	4
	C	0-7	Interior	28	28	20	28	25	17	28	22	15	28	20	14	25	18	13	23	16	11	21	15	10	17	12	9	15	11	7	13	9	6	11	8	5	10	7	7	9	6	7
			Exposed	25	18	12	22	16	11	20	14	10	18	13	9	16	12	8	15	10	7	13	10	7	11	8	6	9	7	7	8	6	7	8	5	6	7	5	5	6	4	
		7-20	Interior	28	21	17	28	19	15	26	17	14	23	15	12	21	13	11	19	12	10	17	11	9	15	9	8	12	8	6	11	7	6	9	6	7	8	5	7	7	7	6
			Exposed	21	13	11	19	12	10	17	11	9	15	10	8	13	9	7	12	8	6	11	7	6	9	6	8	8	6	7	7	6	6	6	5	8	5	4	7	4	4	
20-27		Interior	29	25	18	29	23	15	29	20	14	29	18	12	29	16	11	26	15	10	24	14	9	20	11	8	17	10	6	14	8	6	13	7	5	11	6	4	10	6	6	
		Exposed	29	16	11	25	14	10	23	13	9	20	12	8	18	10	7	17	10	6	15	9	6	13	7	5	11	6	4	9	5	5	8	7	5	7	6	4	6	5	4	
27-45	Interior	29	29	23	29	28	20	28	25	18	26	23	15	23	15	23	21	14	21	19	12	19	17	11	16	14	9	14	12	7	12	10	6	10	9	5	9	8	5	8	7	4
	Exposed	23	20	14	20	18	12	18	16	10	16	15	9	15	13	8	13	12	7	12	11	7	10	9	6	9	8	5	8	7	4	7	6	5	5	6	8	5	7	4		
D	0-7	Interior	28	23	16	28	21	14	26	19	13	23	17	12	21	15	10	19	14	9	17	12	9	14	10	7	12	9	6	11	8	5	9	7	7	8	6	6	7	8	5	
		Exposed	21	15	10	18	13	9	17	12	8	15	11	7	13	10	7	12	9	6	11	8	5	9	7	7	8	6	6	7	7	5	6	7	8	6	4	7	5	3		
	7-20	Interior	27	17	14	24	15	13	22	14	11	19	12	10	17	11	9	16	10	8	14	9	8	12	8	6	10	7	5	9	6	7	8	6	6	7	7	5	6	6	5	
		Exposed	17	11	9	15	10	8	14	9	7	12	8	6	11	7	6	10	6	5	9	6	7	8	6	7	7	5	6	6	6	5	8	6	4	7	4	3	6	4	3	
	20-27	Interior	29	21	14	29	19	13	29	17	11	26	15	10	24	14	9	22	12	8	20	11	8	16	9	6	14	8	5	12	7	5	10	6	6	9	5	5	8	7	5	
		Exposed	24	14	9	21	12	8	19	11	7	17	10	6	15	9	6	14	8	5	13	7	5	11	6	6	9	5	5	8	7	6	4	6	5	3	8	5	3			
27-45	Interior	29	27	19	26	24	16	24	21	14	21	19	12	19	17	11	17	16	10	16	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	5		
	Exposed	19	17	11	17	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	7	7	4	6	6	5	5	8	4	7	7	4	7	6	3		
10	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	17	20	20	15	20	18	13	20	15	11	18	13	9	16	11	8	14	10	7	12	9	6		
			Exposed	20	20	18	20	20	16	20	20	14	20	19	13	20	17	12	20	15	11	19	14	10	16	12	8	14	10	7	12	8	6	10	7	8	9	6	7	8	6	6
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	18	20	19	16	20	18	14	20	16	13	20	13	11	18	11	9	15	10	8	13	9	7	12	7	6	10	7	5
			Exposed	20	19	16	20	17	14	20	15	13	20	14	11	19	12	10	18	11	9	16	10	8	13	9	7	11	7	6	10	6	5	9	5	7	7	6	7	7	5	
		20-27	Interior	26	26	26	26	26	25	26	26	22	26	26	19	26	24	16	26	22	15	26	20	13	26	16	11	25	14	9	21	12	8	18	10	7	16	9	6	14	8	5
			Exposed	26	24	16	26	21	14	26	19	13	26	17	11	26	15	10	24	14	9	22	13	8	18	11	7	16	9	6	13	8	5	12	7	4	10	6	6	9	5	5
	27-45	Interior	28	28	28	28	28	28	28	28	27	28	28	24	28	28	21	28	27	19	28	25	17	23	21	14	20	18	11	17	15	10	15	13	8	13	12	7	11	10	6	
		Exposed	28	28	21	28	26	18	26	23	16	24	21	14	21	19	13	19	17	11	18	16	10	15	13	8	13	11	7	11	10	6	9	8	5	8	7	4	7	7	4	
	C	0-7	Interior	20	20	20	20	20	17	20	15	20	14	20	18	13	20	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	5	10	7	7	9	6	7		
			Exposed	20	18	12	20	16	11	20	14	10	18	13	9	16	12	8	15	10	7	13	10	7	11	8	6	9	7	7	8	6	7	8	5	6	7	5	5	6	4	
		7-20	Interior	20	20	17	20	19	15	20	17	14	20	15	12	20	13	11	19	12	10	17	11	9	15	9	8	12	8	6	11	7	6	9	6	7	8	5	7	7	7	6
			Exposed	20	13	11	19	12	10	17	11	9	15	10	8	13	9	7	12	8	6	11	7	6	9	6	8	8	6	7	7	6	6	6	5	8	5	4	7	4	4	
20-27		Interior	26	25	18	26	23	15	26	20	14	26	18	12	26	16	11	26	15	10	24	14	9	20	11	8	17	10	6	14	8	6	13	7	5	11	6	4	10	6	6	
		Exposed	26	16	11	25	14	10	23	13	9	20	12	8	18	10	7	17	10	6	15	9	6	13	7	5	11	6	4	9	5	5	8	7	5	7	6	4	6	5	4	
27-45	Interior	28	28	23	28	28	20	28	25	18	26	23	15	23	15	23	21	14	21	19	12	19	17	11	16	14	9	14	12	7	12	10	6	10	9	5	9	8	5	8	7	4
	Exposed	23	20	14	20	18	12	18	16	10	16	15	9	15	13	8	13	12	7	12	11	7	10	9	6	9	8	5	8	7	4	7	6	5	5	6	8	5	7	4		
D	0-7	Interior	20	20	16	20	20	14	20	19	13	20	17	12	20	15	10	19	14	9	17	12	9	14	10	7	12	9	6	11	8	5	9	7	7	8	6	6	7	8	5	
		Exposed	20	15	10	18	13	9	17	12	8	15	11	7	13	10	7	12	9	6	11	8	5	9	7	7	8	6	6	7	7	5										



* 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.



ASCE 7-16
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

23 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

SM
Rail Type

PRO SERIES
Clamp

Flashloc DUO OSB
Attachment

SPAN TABLES

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

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

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



* 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.



ASCE 7-16
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

19 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

SM
Rail Type

UAF
Clamp

Flashloc DUO OSB
Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																													
				90						95						100						105						110						115						120						130						140						150						160						170						180					
				Roof Wind Zone																																																																													
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																				
0	B	0-7	Interior	34	34	31	34	34	28	34	34	25	34	32	22	34	29	20	34	26	18	34	24	17	28	20	14	24	17	12	20	15	10	18	13	9	15	11	8	14	10	7	5	6	7	5	6																																		
			Exposed	34	29	20	34	26	18	32	23	16	29	20	14	26	19	13	23	17	12	21	15	11	18	13	9	15	11	8	13	9	7	11	8	6	10	7	5	9	6	7	5	6																																					
		7-20	Interior	34	34	27	34	30	24	34	27	22	34	24	19	34	21	18	31	19	16	28	18	15	23	15	12	20	13	10	17	11	9	15	9	8	13	8	7	11	7	6	7	5	6																																				
			Exposed	34	21	18	30	19	16	27	17	14	24	15	13	21	14	11	19	13	10	18	11	9	15	10	8	13	8	7	11	7	6	9	6	5	8	5	7	7	5	6																																							
		20-27	Interior	34	34	32	34	34	27	34	32	23	34	29	20	34	26	18	34	24	16	34	22	15	32	18	12	27	15	10	23	13	9	20	12	8	18	10	7	16	9	6	7	5	6																																				
			Exposed	34	26	18	34	23	16	34	21	14	33	19	12	29	17	11	27	15	10	24	14	9	20	12	8	17	10	7	15	9	6	13	7	5	11	7	4	10	6	4	5	6																																					
	C	0-7	Interior	35	35	35	35	35	34	35	35	30	35	35	26	35	33	23	33	30	21	30	27	18	26	23	15	22	19	12	19	17	10	16	15	9	14	13	8	13	11	7	5	6																																					
			Exposed	35	33	23	33	29	20	29	26	18	26	23	15	24	21	14	21	19	12	20	17	11	16	15	9	14	13	8	12	11	6	11	9	6	9	8	5	8	7	4	5	6																																					
		7-20	Interior	34	31	22	34	28	19	34	25	17	31	22	15	28	20	14	25	18	13	23	16	11	19	14	10	16	12	8	14	10	7	12	9	6	11	8	5	9	7	5	6																																						
			Exposed	28	20	14	25	18	12	22	16	11	20	14	10	18	13	9	16	12	8	15	11	7	12	9	6	11	8	5	9	6	4	8	6	7	5	5	6	7	5	6																																							
		20-27	Interior	34	23	19	32	20	17	29	18	15	26	16	13	23	15	12	21	13	11	19	12	10	16	10	8	14	9	7	12	8	6	10	7	5	9	6	5	8	5	6																																							
			Exposed	23	15	12	20	13	11	18	12	10	16	11	9	15	10	8	13	9	7	12	8	6	10	7	5	9	6	5	8	5	6	7	5	5	6	7	5	5	6																																								
D	0-7	Interior	34	28	19	34	25	17	34	22	15	34	20	13	32	18	12	29	16	11	26	15	10	22	13	8	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	5	6																																						
		Exposed	32	18	12	28	16	11	25	14	10	22	13	9	20	12	8	18	11	7	17	10	6	14	8	5	12	7	4	10	6	4	9	5	5	8	4	5	7	6	4	5	6																																						
	7-20	Interior	35	35	25	35	31	22	31	28	19	28	25	17	25	23	15	23	21	13	21	19	12	18	16	10	15	13	8	13	12	7	11	10	6	10	9	5	9	8	5	6																																							
		Exposed	25	23	15	23	20	13	20	18	11	18	16	15	10	16	15	9	15	13	8	14	12	7	11	10	6	10	9	5	8	4	7	4	6	6	5	6	5	6	7	5	6																																						
	20-27	Interior	34	26	18	32	23	16	29	20	14	26	18	13	23	17	12	21	15	10	19	14	10	16	12	8	14	10	7	12	8	6	10	7	5	9	6	6	4	8	6	6																																							
		Exposed	23	16	12	20	15	10	18	13	9	16	12	8	15	11	7	13	10	7	12	9	6	10	7	5	9	6	5	8	5	6	7	5	5	6	7	5	5	6	7	5	6																																						
10	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	24	18	24	24	17	24	20	14	24	17	12	20	15	10	18	13	9	15	11	8	14	10	7	5	6																																						
			Exposed	24	24	20	24	24	18	24	23	16	24	20	14	24	19	13	23	17	12	21	15	11	18	13	9	15	11	8	13	9	7	11	8	6	10	7	5	9	6	7	5	6																																					
		7-20	Interior	24	24	24	24	24	24	24	24	22	24	24	19	24	19	16	24	18	15	23	15	12	20	13	10	17	11	9	15	9	8	13	8	7	11	7	6	7	5	6																																							
			Exposed	24	21	18	24	19	16	24	17	14	24	15	13	21	14	11	19	13	10	18	11	9	15	10	8	13	8	7	11	7	6	9	6	5	8	5	7	7	5	6																																							
		20-27	Interior	31	31	31	31	31	27	31	31	23	31	29	20	31	26	18	31	24	16	31	22	15	31	18	12	27	15	10	23	13	9	20	12	8	18	10	7	16	9	6																																							
			Exposed	31	26	18	31	23	16	31	21	14	31	19	12	29	17	11	27	15	10	24	14	9	20	12	8	17	10	7	15	9	6	13	7	5	11	7	4	10	6	4	5	6																																					
	C	0-7	Interior	34	34	34	34	34	34	34	34	30	34	34	26	34	33	23	33	30	21	30	27	18	26	23	15	22	19	12	19	17	10	16	15	9	14	13	8	13	11	7	5	6																																					
			Exposed	34	33	23	33	29	20	29	26	18	26	23	15	24	21	14	21	19	12	20	17	11	16	15	9	14	13	8	12	11	6	11	9	6	9	8	5	8	7	4	5	6																																					
		7-20	Interior	24	24	22	24	24	19	24	24	17	24	22	15	24	20	14	24	18	13	23	16	11	19	14	10	16	12	8	14	10	7	12	9	6	11	8	5	9	7	5	6																																						
			Exposed	24	20	14	24	18	12	22	16	11	20	14	10	18	13	9	16	12	8	15	11	7	12	9	6	11	8	5	9	6	4	8	6	7	5	5	6	7	5	6																																							
		20-27	Interior	24	23	19	24	20	17	24	18	15	24	16	13	23	15	12	21	13	11	19	12	10	16	10	8	14	9	7	12	8	6	10	7	5	9	6	5	8	5	6																																							
			Exposed	23	15	12	20	13	11	18	12	10	16	11	9	15	10	8	13	9	7	12	8	6	10	7	5	9	6	5	8	5	6	7	5	5	6	7	5	5	6																																								
D	0-7	Interior	31	28	19	31	25	17	31	22	15	31	20	13	31	18	12	29	16	11	26	15	10	22	13	8	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	5	6																																						
		Exposed	31	18	12	28	16	11	25	14	10	22	13	9	20	12	8	18	11	7	17	10	6	14	8	5	12	7	4	10	6	4	9	5	5	8	4	5	7	6	4	5	6																																						
	7-20	Interior	34	34	25	34	31	22	31	28	19	28	25	17	25	23	15	23	21	13	21	19	12	18	16	10	15	13	8	13	12	7	11	10	6	10	9	5	9	8	5	6																																							
		Exposed	25	23	15	23	20	13	20	18	11	18	16	15	10	16	15	9	15	13	8	14	12	7	11	10	6	10	9	5	8	4	7	4	6	6	5	6	5	6	7	5	6																																						
	20-27	Interior	24	24	18	24	23	16	24	20	14	24	18	13	23	17	12	21	15	10	19	14	10	16	12	8	14	10	7	12	8	6	10	7	5	9	6	6	4	8	6	6																																							
		Exposed	23	16	12	20	15	10	18	13	9	16	12	8	15	11	7	13	10	7	12	9	6	10	7	5	9	6	5	8	5	6	7	5	5	6	7	5	5	6	7	5	6																																						
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Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

[illegible]

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ASCE 7-16
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

19 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

SM
Rail Type

UAF
Clamp

Flashloc DUO OSB
Attachment

SPAN TABLES

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

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

30 ft

Roof Height

S_s = 3.00

19 sq.ft

ORIENTATION

CROSS-SLOPE
Rail Direction

SM

UAF
ClampFlashloc DUO OSB
Attachment

SPAN TABLES

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