

Design Criteria for Span Tables:

Values in the maximum allowable rail span tables provided herein are subject to the following general criteria and additional criteria shown on individual span tables sheets. Values in span tables are based on the same engineering methodology and calculation algorithms used for U-Builder and are provided here for reference.

Building Assumptions

- Building Risk Category: II
- Mean Roof Height: 30 ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-22 Sec. 29.4.4
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, $k_{zt} = 1.0$
- $\gamma_E = 1.0$ for 'Interior' spans, $\gamma_E = 1.5$ for 'Exposed' spans (ASCE 7-22, Fig. 29.4-7)

Snow Design Assumptions

- Ground Snow Load = 0-100 psf
- Exposure Factor coefficients of Partially Exposed condition
- Thermal Factor = 1.0
- Results based on uniform snow load

Seismic Design Assumptions

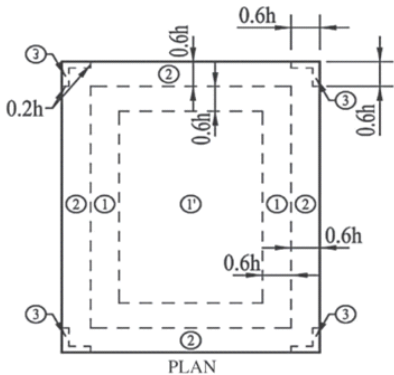
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 with $S_{ds} = 1, 2.4$ respectively per criteria shown on individual span tables sheets.
- $S_1 = 0.5$ & $S_{d1} = 0.6$
- Seismic site class D

Array Assumptions

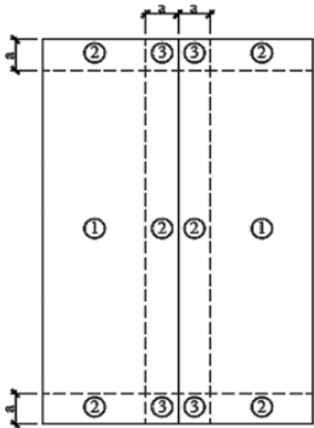
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at least twice the module height above roof surface.
- Modules are parallel to roof surface and maximum height above roof surface is 5" to 10" depending on attachment type.
- Gaps between module rows and columns is 0.25" in to 1" depending on clamp type.
- The most restrictive of all roof zone spans shall be used when any part of the module is attributed to that span.
- 'Exposed' spans as defined in ASCE 7-22 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.

Span Tables

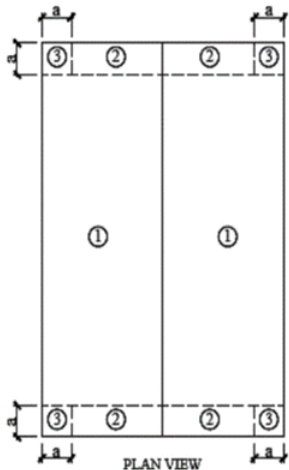
Zone should be considered as per ASCE 7-22, Fig. 30.3-2A to 30.3-2D



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



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



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

Rails can be installed in these possible orientations.

	*CT5
Y+	Alternate orientation not allowed
Y-	



ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

19 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

Solarhooks CT5
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	86	86	86	86	86	83	86	86	80	86	86	77	86	84	74	86	81	71	86	78	68	83	73	64	78	68	60	73	65	51	70	61	42	66	57	37	63	48	33						
			Exposed	86	84	73	86	80	70	86	76	67	83	73	65	80	71	62	77	68	60	75	66	55	70	62	42	66	55	36	62	45	31	59	39	27	49	34	36	41	30	32						
		7-20	Interior	86	86	85	86	86	81	86	86	77	86	84	74	86	81	71	86	77	69	86	75	66	80	70	62	75	65	54	70	62	42	66	56	37	63	45	32	60	39	29						
			Exposed	86	80	71	86	77	68	84	73	65	80	70	62	77	68	60	74	65	53	71	63	45	67	57	37	63	43	32	59	37	28	46	33	36	39	29	32	35	26	29						
		20-27	Interior	87	87	87	87	87	87	87	87	84	87	87	81	87	84	77	87	80	74	87	77	72	87	72	67	83	68	63	78	64	59	74	60	46	70	52	39	67	42	35						
			Exposed	87	84	77	87	80	74	87	76	70	87	73	67	86	70	65	82	67	62	79	65	60	74	61	47	70	50	38	66	40	33	62	35	29	59	31	26	50	28	35						
	27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	87	82	87	86	79	87	83	76	83	78	71	78	73	67	73	69	63	69	65	60	61	51	52	52	42						
		Exposed	87	87	82	87	85	78	87	82	75	84	78	72	81	75	69	77	73	67	75	70	64	70	66	60	65	62	49	62	56	40	56	45	35	44	39	31	39	35	27							
	C	0-7	Interior	86	85	75	86	82	72	86	78	69	85	75	66	82	72	64	79	70	61	76	67	59	71	63	46	67	59	38	64	49	33	60	41	29	53	36	25	44	32	34						
			Exposed	82	72	64	78	69	61	75	66	56	72	64	47	69	61	41	67	59	38	65	52	34	61	41	29	51	35	25	42	31	33	37	27	29	32	36	25	29	32	22						
		7-20	Interior	86	82	73	86	79	69	86	75	66	82	72	64	79	69	61	76	67	59	73	64	50	68	60	39	64	48	34	61	39	29	51	34	26	41	30	34	37	27	30						
			Exposed	79	69	61	75	66	56	72	63	46	69	61	40	66	55	36	64	47	33	62	41	30	52	35	26	41	30	33	35	26	29	31	34	25	27	30	22	36	27	29						
20-27		Interior	87	86	79	87	81	75	87	78	72	87	75	69	87	72	66	84	69	64	81	66	62	76	62	52	71	55	41	67	43	35	64	37	31	61	33	27	54	29	36							
		Exposed	87	71	66	83	68	63	80	65	61	77	63	54	74	60	45	71	54	40	68	46	37	64	38	31	60	32	27	51	28	35	42	37	31	37	33	27	33	29	24							
D	0-7	Interior	87	87	84	87	87	80	87	84	77	86	80	74	82	77	71	79	74	68	76	72	66	71	67	62	64	63	54	53	42	45	45	37	39	39	33	35	35	29								
		Exposed	82	77	71	78	73	68	75	70	65	72	68	62	69	65	60	67	63	53	64	61	45	60	50	37	47	40	32	39	35	28	34	31	37	30	27	32	27	36	29							
	7-20	Interior	86	79	70	86	76	67	83	73	64	79	70	62	76	67	59	73	65	51	71	63	45	66	58	37	63	46	32	59	39	28	49	34	36	41	30	32	36	27	29							
		Exposed	76	67	59	73	64	49	70	62	42	67	59	38	65	52	34	62	45	31	60	41	29	49	34	37	40	29	32	35	25	27	30	34	24	27	30	21	36	26	19							
	20-27	Interior	86	76	67	83	73	64	80	70	62	76	67	59	73	64	50	70	62	42	68	60	39	63	46	33	60	38	28	47	33	37	39	29	32	35	25	28	31	34	25							
		Exposed	73	64	49	70	61	41	67	57	37	64	47	34	62	41	30	59	37	28	51	34	25	40	29	33	34	25	28	29	33	24	26	29	21	34	25	19	30	22	17							
10	B	0-7	Interior	87	79	73	87	75	70	87	72	67	85	69	64	81	66	62	78	64	59	75	62	51	70	53	40	66	41	34	63	35	29	59	31	26	49	27	34	41	37	30						
			Exposed	81	66	61	77	63	57	74	61	47	71	55	40	68	46	37	66	40	33	64	37	31	60	31	26	48	27	34	40	35	29	35	31	26	31	27	28	27	24	29						
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	72	72	69	72	72	66	72	70	62	69	72	72	66	72	65	53	71	63	45	67	57	37	63	43	32	59	37	28	46	33
			Exposed	82	82	82	82	82	82	82	82	82	82	82	81	82	82	77	82	80	74	82	77	72	82	67	82	68	63	78	64	59	74	60	46	70	52	39	67	42	35							
		20-27	Interior	82	82	77	82	80	74	82	76	70	82	73	67	82	70	65	82	67	62	79	65	60	74	61	47	70	50	38	66	40	33	62	35	29	59	31	26	50	28	35						
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	76	83	78	71	78	73	67	73	69	63	69	65	60	61	51	52	52	42								
	C	0-7	Interior	71	71	71	71	71	71	71	71	69	71	71	66	71	61	64	71	61	70	61	71	67	59	71	63	46	67	59	38	64	49	33	60	41	29	53	36	25	44	32	34					
			Exposed	71	71	64	71	69	61	71	66	56	71	64	47	69	61	41	67	59	38	65	52	34	61	41	29	51	35	25	42	31	33	37	27	29	32	36	25	29	32	22						
		7-20	Interior	72	72	72	72	72	69	72	72	66	72	62	64	72	69	61	72	67	59	72	64	50	68	60	39	64	48	34	61	39	29	51	34	26	41	30	34	37	27	30						
			Exposed	72	69	61	72	66	56	72	63	46	69	61	40	66	55	36	64	47	33	62	41	30	52	35	26	41	30	33	35	26	29	31	34	25	27	30	22	36	27	29						
		20-27	Interior	82	82	79	82	81	75	82	78	72	82	75	69	82	72	66	82	69	64	81	66	62	76	62	52	71	55	41	67	43	35	64	37	31	61	33	27	54	29	36						
			Exposed	82	71	66	82	68	63	80	65	61	77	63	54	74	60	45	71	54	40	68	46	37	64	38	31	60	32	27	51	28	35	42	37	31	37	33	27	33	29	24						
D	0-7	Interior	86	86	84	86	86	80	86	84	77	86	80	74	82	77	71	79	74	68	76	72	66	71	67	62	64	63	54	53	42	45	45	37	39	39	33	35	35	29								
		Exposed	82	77	71	78	73	68	75	70	65	72	68	62	69	65	60	67	63	53	64	61	45	60	50	37	47	40	32	39	35	28	34	31	37	30	27	32	27	36	29							
	7-20	Interior	71	71	70	71	71	67	71	64	71	70	62	71	67	59	71	65	51	71	63	45	66	58	37	63	46	32	59	39	28	49	34	36	41	30	32	36	27	29								
		Exposed	71	67	59	71	64	49	70	62	42	67	59	38	65	52	34	62	45	31	60	41	29	49	34	37	40	29	32	35	25	27	30	34	24	27	30	21	36	26	19							
	20-27	Interior	72	72	67	72	72	64	72	70	62	72	67	59	72	64	50	70	62	42	68	60	39	63	46	33	60	38	28	47	33	37	39	29	32	35	25	28	31	34	25							
		Exposed	72	64	49	70	61	41	67	57	37	64	47	34	62	41	30	59	37	28	51	34	25	40	29	33	34	25	28	29	33	24	26	29	21	34	25	19	30	22	17							
20	B	0-7	Interior	84	79	73	84	75	70	84	72	67	84	69	64	81	66	62	78	64	59	75	62	51	70	53	40	66	41	34	63	35	29	59	31	26	49	27	34	41	37	30						
			Exposed	81	66	61																																										

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

[illegible]

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



30 ft

19 sq.ft

CROSS-SLOPE

NXT COMBO

SPAN TABLES

[illegible]

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



ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

19 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

Solarhooks CT5
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	102	102	102	102	102	102	102	102	97	102	102	92	102	102	88	102	98	84	102	94	81	101	87	75	94	81	70	88	76	66	82	72	63	78	68	60	74	65	55						
			Exposed	102	102	88	102	97	83	102	92	79	102	88	76	97	84	72	93	81	69	89	77	67	83	72	63	77	67	60	73	64	53	68	61	46	65	57	60	62	51	54						
		7-20	Interior	102	102	102	102	102	100	102	102	94	102	102	89	102	99	85	102	94	81	102	90	77	98	82	71	90	76	66	83	71	63	78	67	60	73	64	55	69	61	49						
			Exposed	102	99	85	102	93	80	102	88	76	99	83	72	94	79	69	89	76	66	85	73	64	78	67	60	72	63	54	68	60	47	64	55	60	61	48	54	59	43	48						
		20-27	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	94	103	99	90	103	94	85	103	86	78	102	80	72	95	74	68	89	69	64	83	65	61	79	63	58					
			Exposed	103	103	94	103	99	88	103	92	83	103	87	79	103	83	75	101	79	72	97	76	69	89	70	64	83	65	61	77	62	56	73	59	49	69	52	43	65	46	58						
	C	0-7	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	97	103	103	97	103	102	92	103	94	85	95	87	79	88	82	73	82	77	69	77	72	65	73	68	63
			Exposed	103	103	101	103	103	96	103	100	90	103	95	86	100	91	82	95	87	78	90	83	75	82	77	69	76	72	65	71	67	62	67	64	59	63	61	52	61	58	46						
		7-20	Interior	102	102	90	102	99	86	102	94	81	102	90	78	100	86	74	96	83	71	92	79	68	85	74	64	79	69	61	74	65	56	70	62	49	66	60	43	64	54	57						
			Exposed	100	86	74	95	82	70	90	78	67	86	74	64	82	71	62	79	69	61	76	66	58	70	62	49	66	59	42	63	51	55	60	45	48	54	59	43	48	53	88						
		20-27	Interior	97	82	70	91	77	67	86	73	64	81	70	62	77	67	60	74	64	56	71	62	51	65	58	43	62	50	56	59	44	49	52	57	43	46	51	88	60	45	84						
			Exposed	103	85	77	103	80	73	97	76	69	92	72	66	88	69	64	84	66	62	81	64	60	75	60	52	70	54	45	65	47	59	63	41	51	60	55	45	55	49	40						
	D	0-7	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103					
			Exposed	103	93	84	96	88	79	91	84	75	86	80	72	82	76	69	78	73	66	75	70	64	71	62	68	65	60	64	62	54	61	59	47	58	52	41	51	46	55	45	60	49				
		7-20	Interior	102	96	83	102	91	79	101	87	75	96	83	71	92	79	68	88	76	66	84	73	64	78	68	60	73	64	53	69	61	46	65	57	60	62	50	54	60	45	48						
			Exposed	92	79	68	87	75	65	83	72	63	79	69	61	76	66	58	73	64	53	70	62	48	65	58	60	62	49	53	59	43	46	51	57	40	45	50	86	60	44	82						
		20-27	Interior	102	92	79	102	87	75	98	82	71	92	78	68	88	75	65	84	71	63	80	68	61	73	64	55	68	61	47	64	55	41	61	48	54	58	43	48	52	57	43						
			Exposed	88	74	65	82	71	62	78	67	60	74	64	56	71	62	51	68	60	47	65	58	43	62	49	55	57	42	47	50	55	44	43	48	36	58	42	32	51	38	28						
10	B	0-7	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103						
			Exposed	103	93	84	96	88	79	91	84	75	86	80	72	82	76	69	78	73	66	75	70	64	71	62	68	65	60	64	62	54	61	59	47	58	52	41	51	46	55	45	60	49				
		7-20	Interior	102	96	83	102	91	79	101	87	75	96	83	71	92	79	68	88	76	66	84	73	64	78	68	60	73	64	53	69	61	46	65	57	60	62	50	54	60	45	48						
			Exposed	92	79	68	87	75	65	83	72	63	79	69	61	76	66	58	73	64	53	70	62	48	65	58	60	62	49	53	59	43	46	51	57	40	45	50	86	60	44	82						
		20-27	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	94	100	99	90	100	94	85	100	86	78	100	80	72	95	74	68	89	69	64	83	65	61	79	63	58						
			Exposed	100	100	94	100	98	88	100	92	83	100	87	79	100	83	75	100	79	72	97	76	69	89	70	64	83	65	61	77	62	56	73	59	49	69	52	43	65	46	58						
	C	0-7	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102					
			Exposed	102	102	101	102	102	96	102	100	90	102	95	86	100	91	82	95	87	78	90	83	75	82	77	69	76	72	65	71	67	62	67	64	59	63	61	52	61	58	46						
		7-20	Interior	95	95	90	95	95	86	95	94	81	95	90	78	95	86	74	95	83	71	92	79	68	85	74	64	79	69	61	74	65	56	70	62	49	66	60	43	64	54	57						
			Exposed	95	86	74	95	82	70	90	78	67	86	74	64	82	71	62	79	69	61	76	66	58	70	62	49	66	59	42	63	51	55	60	45	48	54	59	43	48	53	88						
		20-27	Interior	96	96	87	96	96	86	96	96	94	96	96	89	96	96	85	96	94	81	96	90	77	96	82	71	90	76	66	83	71	63	78	67	60	73	64	55	69	61	49						
			Exposed	96	96	85	96	93	80	96	88	76	96	83	72	94	79	69	89	76	66	85	73	64	78	67	60	72	63	54	68	60	47	64	55	60	61	48	54	59	43	48						
	D	0-7	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	94	100	99	90	100	94	85	100	86	78	100	80	72	95	74	68	89	69	64	83	65	61	79	63	58						
			Exposed	100	100	94	100	98	88	100	92	83	100	87	79	100	83	75	100	79	72	97	76	69	89	70	64	83	65	61	77	62	56	73	59	49	69	52	43	65	46	58						
		7-20	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102					
			Exposed	102	102	101	102	102	96	102	100	90	102	95	86	100	91	82	95	87	78	90	83	75	82	77	69	76	72	65	71	67	62	67	64	59	63	61	52	61	58	46						
		20-27	Interior	95	95	90	95	95	86	95	94	81	95	90	78	95	86	74	95	83	71	92	79	68	85	74	64	79	69	61	74	65	56	70	62	49	66	60	43	64	54	57						
			Exposed	95	86	74	95	82	70	90	78	67	86	74	64	82	71	62	79	69	61	76	66	58	70	62	49	66	59	42	63	51	55	60	45	48	54	59	43	48	53	88						
20	B	0-7	Interior	96	96	86	96	96	86	96	96	94	96	96	89	96	96	85	96	94	81	96	90	77	96	82	71	90	76	66	83	71	63	78	67	60	73	64	55	69	61	49						
			Exposed	96	96	85	96	93	80	96	88	76	96	83	72	94	79	69	89	76	66	85	73	64	78	67	60																					

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

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[illegible]

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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																		Roof Wind Zone																		Roof Wind Zone																							
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3															
0	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	68	74	74	66	74	70	61	74	66	54	70	62	43	67	58	35	63	48	31	60	40	27																					
			Exposed	74	74	71	74	74	67	74	73	65	74	70	62	74	68	60	74	65	53	71	63	46	67	59	35	63	46	50	60	37	26	49	32	34	41	28	30	35	25	27																					
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	72	74	74	69	74	66	74	72	64	74	67	60	72	63	45	68	59	35	64	47	31	61	37	27	54	32	24																						
			Exposed	74	74	69	74	74	65	74	71	63	74	68	60	74	65	53	72	63	44	69	61	38	64	48	31	60	36	27	50	31	35	39	27	30	33	24	27	29	32	24																					
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	69	75	70	65	75	65	61	75	62	50	71	55	38	67	43	33	64	35	29																					
			Exposed	75	75	75	75	75	75	71	75	74	68	75	70	65	75	68	63	75	65	60	75	63	54	71	56	39	67	42	32	63	34	28	60	29	24	51	26	32	42	35	29																				
	C	0-7	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	70	65	70	66	61	59	59	53	51	51	42	44	44	35																				
			Exposed	76	76	76	76	76	76	76	76	72	76	75	69	76	72	67	75	70	64	72	67	62	67	63	54	63	59	41	60	47	33	47	38	29	37	33	26	32	29	35																					
		7-20	Interior	74	74	72	74	74	69	74	74	66	74	72	63	74	69	61	74	67	58	73	64	50	68	60	38	64	50	32	61	41	28	53	34	24	44	30	32	37	27	29																					
			Exposed	74	69	61	70	74	66	55	72	63	47	69	61	40	66	57	34	64	49	31	62	43	29	54	34	28	43	29	32	35	25	27	31	34	24	37	30	21	36	26	49																				
		20-27	Interior	74	74	70	74	74	67	74	72	64	74	69	61	74	67	59	73	64	49	71	62	42	66	53	33	62	40	28	55	33	24	43	29	32	35	25	28	31	34	25																					
			Exposed	74	67	58	73	64	47	69	61	39	67	55	34	64	46	30	62	39	28	59	34	25	43	29	33	34	25	28	29	33	24	26	29	21	34	25	19	30	22	47																					
10	D	0-7	Interior	75	75																																																										

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[illegible]

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

[illegible]

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

[illegible]

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ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

23 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

Solarhooks CT5
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	101	101	101	101	101	101	101	101	96	101	101	92	101	101	87	101	97	83	101	93	80	100	86	74	93	80	69	87	75	65	82	71	62	77	67	60	73	64	54			
			Exposed	101	101	87	101	96	83	101	91	79	101	87	75	97	83	72	92	80	69	89	77	66	82	71	62	77	67	59	72	63	51	68	61	45	64	56	59	62	50	53			
		7-20	Interior	102	102	102	102	102	99	102	102	99	102	102	93	102	98	84	102	93	80	102	89	76	97	82	70	89	76	65	82	70	62	77	66	60	72	63	53	68	61	47			
			Exposed	102	98	84	102	92	79	102	87	75	98	83	71	93	79	68	88	75	65	84	72	63	77	66	60	72	63	52	67	60	45	64	54	59	61	47	53	57	42	47			
		20-27	Interior	102	102	102	102	102	102	102	102	102	102	102	99	102	102	93	102	98	89	102	93	84	102	85	77	101	79	72	94	73	67	88	69	63	82	65	61	78	62	57			
			Exposed	102	102	93	102	97	87	102	91	83	102	86	78	102	82	75	100	78	71	96	75	68	88	69	64	82	64	61	76	61	55	72	58	48	68	51	42	65	45	57			
	27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	96	103	101	91	103	93	84	86	78	87	81	73	81	76	68	76	72	65	72	68	62				
		Exposed	103	103	100	103	103	94	103	99	89	103	94	85	99	90	81	94	86	77	89	82	74	82	76	69	75	71	64	70	67	61	66	63	58	63	61	51	61	57	45				
	C	0-7	Interior	101	101	89	101	98	85	101	94	81	101	89	77	99	85	73	95	82	70	91	79	68	84	73	63	78	68	60	74	64	54	69	62	48	66	59	60	63	52	56			
			Exposed	99	85	73	94	81	70	89	77	66	85	74	64	81	71	62	78	68	60	75	65	57	70	62	48	65	58	60	62	50	54	59	44	47	53	58	42	47	52	37			
		7-20	Interior	102	101	86	102	95	81	102	90	77	101	85	73	96	81	70	91	77	67	87	74	64	80	68	61	74	64	55	69	61	48	65	57	42	62	50	56	60	44	50			
			Exposed	96	81	70	90	76	66	85	72	63	80	69	61	77	66	59	73	64	55	70	62	50	65	57	42	62	49	55	58	43	48	51	56	42	45	50	37	59	44	33			
20-27		Interior	102	102	96	102	100	90	102	94	85	102	89	81	102	84	77	102	80	73	98	77	70	94	73	67	90	70	65	84	66	62	78	63	58	74	60	51	70	54	45	66	48	59	
		Exposed	102	84	77	102	79	72	96	75	69	92	72	65	87	68	63	83	65	61	80	63	60	74	60	51	69	53	44	65	46	57	62	60	50	60	54	44	53	48	49				
27-45	Interior	103	103	103	103	103	97	103	102	92	103	97	87	102	92	83	96	88	80	92	84	76	87	81	73	83	78	70	78	73	66	72	68	62	68	64	60	64	62	54	58	58	48		
	Exposed	102	92	83	95	87	79	90	83	75	85	79	71	81	75	68	77	82	65	74	70	63	68	65	60	64	61	53	61	58	46	56	50	60	50	45	53	44	54	59	48				
D	0-7	Interior	101	95	82	101	90	78	100	86	74	95	82	71	91	79	68	87	75	65	83	73	63	77	68	60	72	64	52	68	61	45	64	56	59	62	49	53	59	61	47				
		Exposed	91	78	68	86	75	65	82	71	62	78	68	60	75	65	57	72	63	52	69	62	47	65	56	60	61	48	52	57	60	45	50	55	99	44	49	35	59	41	31				
	7-20	Interior	102	91	78	102	86	74	97	81	70	91	77	67	87	74	64	83	71	62	79	68	61	73	63	54	67	60	46	64	54	60	61	47	53	57	60	47	51	56	42				
		Exposed	87	74	64	82	70	62	77	66	60	73	64	55	70	62	50	67	60	46	65	56	42	61	43	58	54	60	46	48	54	40	42	47	35	56	44	31	50	37	27				
	20-27	Interior	102	96	87	102	90	82	102	85	77	102	81	73	98	77	70	94	73	67	90	70	65	83	65	61	77	62	56	72	58	48	68	51	42	64	45	56	62	60	50				
		Exposed	98	77	70	93	73	66	88	69	64	84	66	62	80	63	60	77	62	55	74	60	50	68	52	43	64	44	55	61	58	48	57	51	42	50	45	37	45	40	33				
27-45	Interior	103	103	94	103	98	88	103	93	84	97	88	80	92	84	76	87	81	73	83	78	70	76	72	65	71	67	62	66	63	58	61	51	55	55	45	49	49	60						
	Exposed	92	84	76	86	80	72	81	76	69	77	73	65	74	69	63	70	67	61	67	64	60	63	61	51	60	55	44	54	48	58	47	61	51	42	56	45	56	50	49					
10	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	85	93	80	95	86	74	93	80	69	87	75	65	82	71	62	77	67	60	73	64	54			
			Exposed	95	95	87	95	95	83	95	91	79	95	87	75	95	83	72	92	80	69	89	77	66	82	71	62	77	67	59	72	63	51	68	61	45	64	56	59	62	50	53			
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	85	93	80	95	86	74	93	80	69	87	75	65	82	70	62	77	66	60	72	63	53	68	61	47
			Exposed	95	95	84	95	92	79	95	87	75	95	83	71	93	79	68	88	75	65	84	72	63	77	66	60	72	63	52	67	60	45	64	54	59	61	47	53	57	42	47			
		20-27	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	93	84	99	85	77	99	79	72	94	73	67	88	69	63	82	65	61	78	62	57				
			Exposed	99	99	93	99	97	87	99	91	83	99	86	78	99	82	75	99	78	71	96	75	68	88	69	64	82	64	61	76	61	55	72	58	48	68	51	42	65	45	57			
	27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	96	102	101	91	102	93	84	94	86	78	87	81	73	81	76	68	76	72	65	72	68	62			
		Exposed	102	102	100	102	102	94	102	99	89	102	94	85	99	90	81	94	86	77	89	82	74	82	76	69	75	71	64	70	67	61	66	63	58	63	61	51	61	57	45				
	C	0-7	Interior	95	95	89	95	95	85	95	94	81	95	89	77	95	85	73	95	82	70	91	79	68	84	73	63	78	68	60	74	64	54	69	62	48	66	59	60	63	52	56			
			Exposed	95	85	73	94	81	70	89	77	66	85	74	64	81	71	62	78	68	60	75	65	57	70	62	48	65	58	60	62	50	54	59	44	47	53	58	42	47	52	37			
		7-20	Interior	95	95	86	95	95	81	95	90	77	95	85	73	95	81	70	91	77	67	87	74	64	80	68	61	74	64	55	69	61	48	65	57	42	62	50	56	60	44	50			
			Exposed	95	81	70	90	76	66	85	72	63	80	69	61	77	66	59	73	64	55	70	62	50	65	57	42	62	49	55	58	43	48	51	56	42	45	50	37	59	44	33			
20-27		Interior	99	99	96	99	99	90	99	94	85	99	89	81	99	84	77	99	80	73	98	77	70	94	73	67	90	70	65	84	66	62	78	63	58	74	60	51	70	54	45	66	48	59	
		Exposed	99	84	77	99	79	72	96	75	69	92	72	65	87	68	63	83	65	61	80	63	60	74	60	51	69	53	44	65	46	57	62	60	50	60	54	44	53	48	49				
27-45	Interior	102	102	102																																									

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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.



ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 1.25
Seismic

23 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

Solarhooks CT5
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																																				
90	B	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31																																		
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31																																	
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32																																
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32																																	
		20-27	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39																																
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39																																	
	C	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47																																	
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47																																	
		7-20	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31																																
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32																																	
		20-27	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39																																
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39																																	
	D	0-7	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	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																																	
		7-20	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																																	
			Exposed	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																																	
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44																																	
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44																																	
27-45	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52																																		
	Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52																																			
100	B	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28																																	
			Exposed	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28																																	
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29																																
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29																																	
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36																																	
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36																																	
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43																																	
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43																																	
		7-20	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28																																																								

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

* Cells with an astrisks 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.



30 ft

$$S_S = 3.00$$

19 sq.ft

PORTRAIT

CROSS-SLOPE

NXT

NXT COMBO

Solarhooks CT5

SPAN TABLES

[illegible]

* Cells with an astrisks 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.

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						
0	B	0-7	Interior	102	102	102	102	102	102	102	97	102	102	92	102	102	88	102	98	84	102	94	81	101	87	75	94	81	70	88	76	66	82	72	63	78	68	60	74	65	55	
			Exposed	102	102	88	102	97	83	102	92	79	102	88	76	97	84	72	93	81	69	89	77	67	83	72	63	77	67	60	73	64	53	68	61	46	65	57	60	62	51	54
		7-20	Interior	102	102	102	102	102	100	102	102	94	102	102	89	102	99	85	102	94	81	102	90	77	98	82	71	90	76	66	83	71	63	78	67	60	73	64	55	69	61	49
			Exposed	102	99	85	102	93	80	102	88	76	99	83	72	94	79	69	89	76	66	85	73	64	78	67	60	72	63	54	68	60	47	64	55	60	61	48	54	59	43	48
		20-27	Interior	103	103	103	103	103	103	103	103	103	103	103	100	103	103	94	103	99	90	103	94	85	103	86	78	102	80	72	95	74	68	89	69	64	83	65	61	79	63	58
			Exposed	103	103	94	103	99	88	103	92	83	103	87	79	103	83	75	101	79	72	97	76	69	89	70	64	83	65	61	77	62	56	73	59	49	69	52	43	65	46	58
	27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	102	103	103	97	103	102	103	103	99	87	79	88	82	73	82	77	69	77	72	65	73	68	63			
		Exposed	103	103	101	103	103	96	103	100	90	103	95	86	100	91	82	95	87	78	90	83	75	82	77	69	76	72	65	71	67	62	67	64	59	63	61	52	61	58	46	
	C	0-7	Interior	102	102	90	102	99	86	102	94	81	102	90	78	100	86	74	96	83	71	92	79	68	85	74	64	79	69	61	74	65	56	70	62	49	66	60	43	64	54	57
			Exposed	100	86	74	95	82	70	90	78	67	86	74	64	82	71	62	79	69	61	76	66	58	70	62	49	66	59	42	63	51	55	60	45	48	54	59	43	48	53	88
		7-20	Interior	102	102	87	102	96	82	102	91	78	102	86	74	97	82	71	92	78	68	88	75	65	80	69	61	74	64	57	69	61	49	65	58	43	62	51	57	60	45	51
			Exposed	97	82	70	91	77	67	86	73	64	81	70	62	77	67	60	74	64	56	71	62	51	65	58	43	62	50	59	44	49	52	57	43	46	51	88	60	45	84	
20-27		Interior	103	103	97	103	101	91	103	95	86	103	90	81	103	85	78	103	81	74	100	78	71	91	72	65	85	66	62	79	63	59	74	60	52	70	55	46	67	49	60	
		Exposed	103	85	77	103	80	73	97	76	69	92	72	66	88	69	64	84	66	62	81	64	60	72	60	52	70	54	45	65	47	59	63	41	51	60	55	45	55	49	49	
27-45	Interior	103	103	103	103	103	98	103	103	103	93	103	98	88	103	93	84	98	89	80	93	85	77	85	79	71	78	74	66	73	69	63	68	65	60	65	62	55	59	59	49	
	Exposed	103	93	84	96	88	79	91	84	75	86	80	72	82	76	69	78	73	66	75	70	64	71	62	68	65	60	64	62	54	61	59	47	58	52	41	51	46	55	45	60	49
D	0-7	Interior	102	96	83	102	91	79	101	87	75	96	83	71	92	79	68	88	76	66	84	73	64	78	68	60	73	64	53	69	61	46	65	57	60	62	50	54	60	45	48	
		Exposed	92	79	68	87	75	65	83	72	63	79	69	61	76	66	58	73	64	53	70	62	48	65	58	60	62	49	53	59	43	46	51	57	40	45	50	86	60	44	82	
	7-20	Interior	102	92	79	102	87	75	98	82	71	92	78	68	88	75	65	84	71	63	80	68	61	73	64	55	68	61	47	64	55	41	61	48	54	58	43	48	52	57	43	
		Exposed	88	74	65	82	71	62	78	67	60	74	64	56	71	62	51	68	60	47	65	58	43	62	49	55	57	42	47	50	55	44	43	48	96	58	42	92	51	88	28	
	20-27	Interior	103	97	88	103	91	83	103	86	78	103	82	74	99	78	71	95	74	68	91	71	65	84	66	62	78	62	57	73	59	49	69	52	43	65	46	58	62	41	51	
		Exposed	99	78	71	94	73	67	89	70	64	85	66	62	81	64	60	77	62	56	74	60	52	69	53	44	65	45	57	62	59	49	58	52	43	51	46	88	46	41	84	
27-45	Interior	103	103	95	103	99	89	103	94	85	98	89	81	93	85	77	88	82	74	84	78	71	77	73	65	72	68	62	67	64	59	63	61	52	56	56	46	50	50	60		
	Exposed	93	85	77	87	81	73	82	77	69	78	73	66	75	70	64	71	62	62	68	65	60	64	61	53	60	57	45	55	49	59	48	43	52	42	57	46	57	51	41		
10	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	94	95	87	95	87	75	94	81	70	88	76	66	82	72	63	78	68	60	74	65	55		
			Exposed	95	95	88	95	95	83	95	82	79	95	88	76	95	84	72	93	81	69	89	77	67	83	72	63	77	67	60	73	64	53	68	61	46	65	57	60	62	51	54
		7-20	Interior	96	96	96	96	96	96	96	96	94	96	96	89	96	96	85	96	94	81	96	90	77	96	82	71	90	76	66	83	71	63	78	67	60	73	64	55	69	61	49
			Exposed	96	96	85	96	93	80	96	88	76	96	83	72	94	79	69	89	76	66	85	73	64	78	67	60	72	63	54	68	60	47	64	55	60	61	48	54	59	43	48
		20-27	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	94	100	99	90	100	94	85	100	86	78	100	80	72	95	74	68	89	69	64	83	65	61	79	63	58
			Exposed	100	100	94	100	98	88	100	92	83	100	87	79	100	83	75	100	79	72	97	76	69	89	70	64	83	65	61	77	62	56	73	59	49	69	52	43	65	46	58
	27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	97	102	102	92	102	94	85	95	87	79	88	82	73	82	77	69	77	72	65	73	68	63	
		Exposed	102	102	101	102	102	96	102	100	90	102	95	86	100	91	82	95	87	78	90	83	75	82	77	69	76	72	65	71	67	62	67	64	59	63	61	52	61	58	46	
	C	0-7	Interior	95	95	90	95	95	86	95	94	81	95	90	78	95	86	74	95	83	71	92	79	68	85	74	64	79	69	61	74	65	56	70	62	49	66	60	43	64	54	57
			Exposed	95	86	74	95	82	70	90	78	67	86	74	64	82	71	62	79	69	61	76	66	58	70	62	49	66	59	42	63	51	55	60	45	48	54	59	43	48	53	88
		7-20	Interior	96	96	87	96	96	82	96	91	78	96	86	74	96	82	71	92	78	68	88	75	65	80	69	61	74	64	57	69	61	49	65	58	43	62	51	57	60	45	51
			Exposed	96	82	70	91	77	67	86	73	64	81	70	62	77	67	60	74	64	56	71	62	51	65	58	43	62	50	59	44	49	52	57	43	46	51	88	60	45	84	
20-27		Interior	100	100	97	100	100	91	100	95	86	100	90	81	100	85	78	100	81	74	100	78	71	91	72	65	85	66	62	79	63	59	74	60	52	70	55	46	67	49	60	
		Exposed	100	85	77	100	80	73	97	76	69	92	72	66	88	69	64	84	66	62	81	64	60	72	60	52	70	54	45	65	47	59	63	41	51	60	55	45	55	49	49	
27-45	Interior	102	102	102	102	102	98	102	102	93	102	98	88	102	93	84	98</																									

* 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.

[illegible]

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

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
				90						95						100						105						110						115						120						130						140						150						160						170						180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				Roof Wind Zone																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
0	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74

* 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.

[illegible]

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



ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

23 sq.ft
Module Area

LANDSCAPE
Orientation

CROSS-SLOPE
Rail Direction

NXT
Rail Type

NXT COMBO
Clamp

Solarhooks CT5
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	101	101	101	101	101	101	101	101	96	101	101	92	101	101	87	101	97	83	101	93	80	100	86	74	93	80	69	87	75	65	82	71	62	77	67	60	73	64	54				
			Exposed	101	101	87	101	96	83	101	91	79	101	87	75	97	83	72	92	80	69	89	77	66	82	71	62	77	67	59	72	63	51	68	61	45	64	56	59	62	50	53				
		7-20	Interior	102	102	102	102	102	99	102	102	99	102	102	93	102	98	84	102	93	80	102	89	76	97	82	70	89	76	65	82	70	62	77	66	60	72	63	53	68	61	47				
			Exposed	102	98	84	102	92	79	102	87	75	98	83	71	93	79	68	88	75	65	84	72	63	77	66	60	72	63	52	67	60	45	64	54	59	61	47	53	57	42	47				
		20-27	Interior	102	102	102	102	102	102	102	102	102	102	102	99	102	102	93	102	98	89	102	93	84	102	85	77	101	79	72	94	73	67	88	69	63	82	65	61	78	62	57				
			Exposed	102	102	93	102	97	87	102	91	83	102	86	78	102	82	75	100	78	71	96	75	68	88	69	64	82	64	61	76	61	55	72	58	48	68	51	42	65	45	57				
	27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	96	103	101	91	103	93	84	86	78	87	81	73	81	76	68	76	72	65	72	68	62					
		Exposed	103	103	100	103	103	94	103	99	89	103	94	85	99	90	81	94	86	77	89	82	74	82	76	69	75	71	64	70	67	61	66	63	58	63	61	51	61	57	45					
	C	0-7	Interior	101	101	89	101	98	85	101	94	81	101	89	77	99	85	73	95	82	70	91	79	68	84	73	63	78	68	60	74	64	54	69	62	48	66	59	60	63	52	56				
			Exposed	99	85	73	94	81	70	89	77	66	85	74	64	81	71	62	78	68	60	75	65	57	70	62	48	65	58	60	62	50	54	59	44	47	53	58	42	47	52	37				
		7-20	Interior	102	101	86	102	95	81	102	90	77	101	85	73	96	81	70	91	77	67	87	74	64	80	68	61	74	64	55	69	61	48	65	57	42	62	50	56	60	44	50				
			Exposed	96	81	70	90	76	66	85	72	63	80	69	61	77	66	59	73	64	55	70	62	50	65	57	42	62	49	55	58	43	48	51	56	42	45	50	37	59	44	33				
20-27		Interior	102	102	96	102	100	90	102	94	85	102	89	81	102	84	77	102	80	73	98	77	70	94	73	67	90	70	61	71	65	84	66	62	78	63	58	74	60	51	70	54	45	66	48	59
		Exposed	102	84	77	102	79	72	96	75	69	92	72	65	87	68	63	83	65	61	80	63	60	74	60	51	69	53	44	65	46	57	62	60	50	60	54	44	53	48	49					
27-45	Interior	103	103	103	103	103	97	103	102	92	103	97	87	102	92	83	96	88	80	92	84	76	87	81	73	83	78	70	78	73	66	72	68	62	68	64	60	64	62	54	58	58	48			
	Exposed	102	92	83	95	87	79	90	83	75	85	79	71	81	75	68	77	82	65	74	70	63	68	65	60	64	61	53	61	53	61	58	46	56	50	60	50	45	53	44	59	48				
D	0-7	Interior	101	95	82	101	90	78	100	86	74	95	82	71	91	79	68	87	75	65	83	73	63	77	68	60	72	64	52	68	61	45	64	56	59	62	49	53	59	61	47					
		Exposed	91	78	68	86	75	65	82	71	62	78	68	60	75	65	57	72	63	52	69	62	47	65	56	60	61	48	52	57	60	45	50	55	99	44	49	35	59	48	31					
	7-20	Interior	102	91	78	102	86	74	97	81	70	91	77	67	87	74	64	83	71	62	79	68	61	73	63	54	67	60	46	64	54	60	61	47	53	57	60	47	51	56	42					
		Exposed	87	74	64	82	70	62	77	66	60	73	64	55	70	62	50	67	60	46	65	56	42	61	43	53	56	60	46	48	54	40	42	47	35	56	44	31	50	37	27					
	20-27	Interior	102	96	87	102	90	82	102	85	77	102	81	73	98	77	70	94	73	67	90	70	65	83	65	61	77	62	56	72	58	48	68	51	42	64	45	56	62	60	50					
		Exposed	98	77	70	93	73	66	88	69	64	84	66	62	80	63	60	77	62	55	74	60	50	68	52	43	64	44	55	61	58	48	57	51	42	50	45	37	45	40	33					
27-45	Interior	103	103	94	103	98	88	103	93	84	97	88	80	92	84	76	87	81	73	83	78	70	76	72	65	71	67	62	66	63	58	61	51	55	55	45	49	49	60							
	Exposed	92	84	76	86	80	72	81	76	69	77	73	65	74	69	63	70	67	61	67	64	60	63	61	51	60	55	44	54	48	58	47	61	51	42	56	45	56	50	49						
10	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	85	93	80	95	86	74	93	80	69	87	75	65	82	71	62	77	67	60	73	64	54				
			Exposed	95	95	87	95	95	83	95	91	79	95	87	75	95	83	72	92	80	69	89	77	66	82	71	62	77	67	59	72	63	51	68	61	45	64	56	59	62	50	53				
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	85	93	80	95	86	74	93	80	69	87	75	65	82	70	62	77	66	60	72	63	53	68	61	47	
			Exposed	95	95	84	95	92	79	95	87	75	95	83	71	93	79	68	88	75	65	84	72	63	77	66	60	72	63	52	67	60	45	64	54	59	61	47	53	57	42	47				
		20-27	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	93	84	99	85	77	99	79	72	94	73	67	88	69	63	82	65	61	78	62	57					
			Exposed	99	99	93	99	97	87	99	91	83	99	86	78	99	82	75	99	78	71	96	75	68	88	69	64	82	64	61	76	61	55	72	58	48	68	51	42	65	45	57				
	27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102					
		Exposed	102	102	100	102	102	94	102	99	89	102	94	85	99	90	81	94	86	77	89	82	74	82	76	69	75	71	64	70	67	61	66	63	58	63	61	51	61	57	45					
	C	0-7	Interior	95	95	89	95	95	85	95	94	81	95	89	77	95	85	73	95	82	70	91	79	68	84	73	63	78	68	60	74	64	54	69	62	48	66	59	60	63	52	56				
			Exposed	95	85	73	94	81	70	89	77	66	85	74	64	81	71	62	78	68	60	75	65	57	70	62	48	65	58	60	62	50	54	59	44	47	53	58	42	47	52	37				
		7-20	Interior	95	95	86	95	95	81	95	90	77	95	85	73	95	81	70	91	77	67	87	74	64	80	68	61	74	64	55	69	61	48	65	57	42	62	50	56	60	44	50				
			Exposed	95	81	70	90	76	66	85	72	63	80	69	61	77	66	59	73	64	55	70	62	50	65	57	42	62	49	55	58	43	48	51	56	42	45	50	37	59	44	33				
20-27		Interior	99	99	96	99	99	90	99	94	85	99	89	81	99	84	77	99	80	73	98	77	70	94	73	67	90	70	61	71	65	84	66	62	78	63	58	74	60	51	70	54	45	66	48	59
		Exposed	99	84	77	99	79	72	96	75	69	92	72	65	87	68	63	83	65	61	80	63	60	74	60	51	69	53	44	65	46	57	62	60	50	60	54	44	53	48	49					

* 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.

[illegible]

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