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, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γE = 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

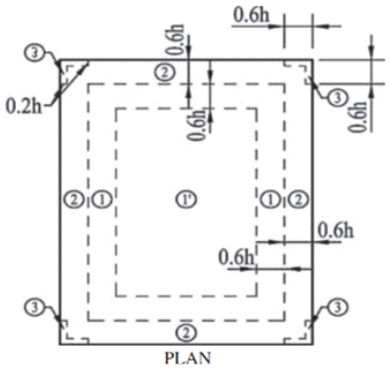
- 0.2-s Spectral Response Acceleration, SS ≤ 3
- S_S = 1.25 and 3 per criteria shown on individual span tables sheets.
- S_1 = 0.5
- Seismic site class D

Array Assumptions

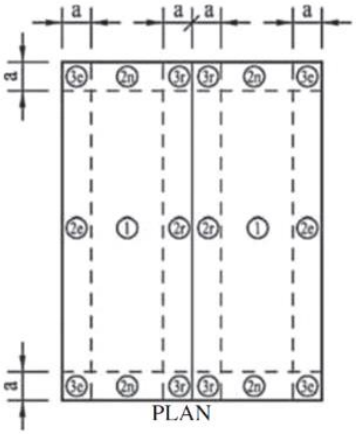
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at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

Span Tables

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



Gable Roofs θ ≤ 7°

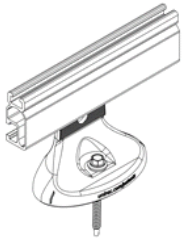


Gable Roofs 7°< θ ≤ 45°

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 Comp**
Y+	
Y-	Alternate orientation not allowed

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ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	83	83	83	83	83	83	83	83	81	83	83	78	83	83	75	83	82	71	83	79	67	83	74	53	79	67	42	75	56	37	69	46	32	61	40	28	51	35	25
			Exposed	83	83	75	83	81	70	83	78	64	83	75	55	82	71	48	79	67	42	76	59	38	69	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	83	83	83	83	83	83	83	83	79	83	82	76	83	78	71	83	75	67	82	72	59	77	61	44	71	47	37	64	39	32	55	34	28	47	30	25	41	27	22
			Exposed	83	78	71	83	75	66	80	70	55	77	63	46	74	54	40	70	46	37	67	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	83	84	84	80	84	81	77	84	78	73	84	72	64	81	64	49	76	50	39	72	41	32	67	36	27	58	32	24
			Exposed	84	84	80	84	80	76	84	77	71	84	73	66	83	69	56	80	62	47	78	54	41	72	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	84	84	80	84	84	77	84	79	71	79	74	62	75	68	49	68	57	41	58	47	35	47	40	30
			Exposed	84	84	83	84	84	79	84	83	76	84	80	72	82	77	68	79	74	61	76	70	53	69	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	83	83	77	83	83	73	83	80	68	83	77	61	83	74	53	81	70	46	78	66	41	72	52	35	65	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	83	74	52	80	69	44	77	62	39	73	53	35	69	47	32	64	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	83	81	75	83	77	69	82	73	62	79	68	52	76	61	44	73	52	39	70	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	76	60	44	72	50	39	68	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	84	84	82	84	83	78	84	79	75	84	76	70	84	72	64	82	68	54	80	60	46	75	46	36	69	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	84	72	63	82	67	51	78	56	43	76	48	37	72	41	33	68	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	84	84	84	84	84	82	84	84	78	84	82	75	84	79	71	81	76	67	78	73	59	72	65	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	84	79	71	80	75	65	77	71	55	73	66	47	69	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	83	82	70	83	78	65	83	75	55	81	70	47	78	66	41	76	58	38	72	51	34	63	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	78	66	41	75	56	37	70	48	33	66	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	83	75	66	80	70	55	77	63	46	74	53	40	70	45	36	66	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	70	45	36	65	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	84	81	76	84	77	71	84	73	66	83	68	55	80	61	46	77	52	40	75	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	80	61	46	76	50	39	73	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	84	84	80	84	83	76	84	80	72	82	77	67	79	73	59	76	69	51	72	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	78	73	59	75	68	49	70	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
10	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	67	74	74	53	74	67	42	74	56	37	69	46	32	61	40	28	51	35	25
			Exposed	74	74	74	74	74	70	74	74	64	74	74	55	74	71	48	74	67	42	74	59	38	69	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	67	74	72	59	74	61	44	71	47	37	64	39	32	55	34	28	47	30	25	41	27	22
			Exposed	74	74	71	74	74	66	74	70	55	74	63	46	74	54	40	70	46	37	67	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	77	81	78	73	81	72	64	81	64	49	76	50	39	72	41	32	67	36	27	58	32	24
			Exposed	81	81	80	81	80	76	81	77	71	81	73	66	81	69	56	80	62	47	78	54	41	72	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	83	77	83	79	71	79	74	62	75	68	49	68	57	41	58	47	35	47	40	30
			Exposed	83	83	83	83	83	79	83	83	76	83	80	72	82	77	68	79	74	61	76	70	53	69	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	74	74	74	74	74	73	74	74	68	74	74	61	74	74	53	74	70	46	74	66	41	72	52	35	65	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	74	74	52	74	69	44	74	62	39	73	53	35	69	47	32	64	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	74	74	74	74	74	69	74	73	62	74	68	52	74	61	44	73	52	39	70	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	74	60	44	72	50	39	68	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	81	81	81	81	81	78	81	79	75	81	76	70	81	72	64	81	68	54	80	60	46	75	46	36	69	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	81	72	63	81	67	51	78	56	43	76	48	37	72	41	33	68	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	83	83	83	83	83	82	83	83	78	83	82	75	83	79	71	81	76	67	78	73	59	72	65	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	83	79	71	80	75	65	77	71	55	73	66	47	69	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	74	74	70	74	74	65	74	74	55	74	70	47	74	66	41	74	58	38	72	51	34	63	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	74	66	41	74	56	37	70	48	33	66	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	74	74	66	74	70	55	74	63	46	74	53	40	70	45	36	66	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	70	45	36	65	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	82	81	76	82	77	71	82	73	66	82	68	55	80	61	46	77	52	40	75	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	80	61	46	76	50	39	73	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	84	84	80	84	83	76	84	80	72	82	77	67	79	73	59	76	69	51	72	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	78	73	59	75	68	49	70	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
20	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	53	62	62	42	62	56	37	62	46	32	61	40	28	51	35	25
			Exposed	62	62	62	62	62	62	62	62	62	62	62	55	62	62	48	62	62	42	62	59	38	62	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	61	44	62	47	37	62	39	32	55	34	28	47	30	25	41	27	22
			Exposed	62	62	62	62	62	62	62	62	55	62	62	46	62	54	40	62	46	37	62	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	72	64	75	64	49	75	50	39	72	41	32	67	36	27	58	32	24
			Exposed	75	75	75	75	75	75	75	75	71	75	73	66	75	69	56	75	62	47	75	54	41	72	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	71	78	74	62	75	68	49	68	57	41	58	47	35	47	40	30
			Exposed	78	78	78	78	78	78	78	78	76	78	78	72	78	77	68	78	74	61	76	70	53	69	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	61	62	62	53	62	62	46	62	62	41	62	52	35	62	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	62	62	52	62	62	44	62	62	39	62	53	35	62	47	32	62	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	52	62	61	44	62	52	39	62	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	62	60	44	62	50	39	62	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	70	75	72	64	75	68	54	75	60	46	75	46	36	69	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	75	72	63	75	67	51	75	56	43	75	48	37	72	41	33	68	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	75	78	78	71	78	76	67	78	73	59	72	65	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	78	78	71	78	75	65	77	71	55	73	66	47	69	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	58	38	62	51	34	62	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	62	62	41	62	56	37	62	48	33	62	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	62	62	62	62	62	55	62	62	46	62	53	40	62	45	36	62	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	62	45	36	62	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	76	76	76	76	76	71	76	73	66	76	68	55	76	61	46	76	52	40	75	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	76	61	46	76	50	39	73	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	79	79	79	79	79	76	79	79	72	79	77	67	79	73	59	76	69	51	72	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	78	73	59	75	68	49	70	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	42	61	56	37	61	46	32	61	40	28	51	35	25
			Exposed	61	61	61	61	61	61	61	61	61	61	61	55	61	61	48	61	61	42	61	59	38	61	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	61	44	62	47	37	62	39	32	55	34	28	47	30	25	41	27	22
			Exposed	62	62	62	62	62	62	62	62	55	62	62	46	62	54	40	62	46	37	62	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	64	49	68	50	39	68	41	32	67	36	27	58	32	24
			Exposed	68	68	68	68	68	68	68	68	68	68	68	66	68	68	56	68	62	47	68	54	41	68	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	71	74*	74*	62	74*	68	49	68	57	41	58	47	35	47	40	30
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	72	74*	74*	68	74*	74*	61	74*	70	53	69	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	46	61	61	41	61	52	35	61	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	61	61	52	61	61	44	61	61	39	61	53	35	61	47	32	61	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	52	62	61	44	62	52	39	62	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	62	60	44	62	50	39	62	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	68	54	68	60	46	68	46	36	68	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	68	68	63	68	67	51	68	56	43	68	48	37	68	41	33	68	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	71	74*	74*	67	74*	73	59	72	65	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	74*	74*	71	74*	74*	65	74*	71	55	74*	66	47	69	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	58	38	62	51	34	62	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	62	62	41	62	56	37	62	48	33	62	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	62	62	62	62	62	55	62	62	46	62	53	40	62	45	36	62	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	62	45	36	62	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	70	70	70	70	70	70	70	70	66	70	68	55	70	61	46	70	52	40	70	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	70	61	46	70	50	39	70	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	75	75	75	75	75	75	75	75	72	75	75	67	75	73	59	75	69	51	72	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	75	73	59	75	68	49	70	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
40	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	42	52	52	42	52	52	37	52	46	32	52	40	28	51	35	25
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	42	52	52	38	52	47	32	52	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	47	37	55	39	32	55	34	28	47	30	25	41	27	22
			Exposed	55	55	55	55	55	55	55	55	55	55	55	46	55	54	40	55	46	37	55	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	64*	65*	64*	49	65*	50	39	65*	41	32	65*	36	27	58	32	24
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	56	65*	62*	47	65*	54	41	65*	42	33	65*	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	62*	66*	66*	49	66*	58*	41	58*	47	35	47	40	30
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	61*	66*	66*	53	66*	58*	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	46	52	52	41	52	52	35	52	42	30	52	36	26	44	32	22	38	28	30	34	25	26
			Exposed	52	52	52	52	52	44	52	52	39	52	52	35	52	47	32	52	41	29	52	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	52	55	55	44	55	52	39	55	45	36	55	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	55	55	44	55	50	39	55	42	35	55	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	64*	65*	65*	54	65*	60	46	65*	46	36	65*	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	65*	65*	63*	65*	65*	51	65*	56	43	65*	48	37	65*	41	33	65*	38	29	63*	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	59*	66*	65*	45	64*	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	66*	66*	66*	66*	66*	65*	66*	66*	55	66*	66*	47	66*	58*	41	62*	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	47	55	55	41	55	55	38	55	51	34	55	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	55	55	41	55	55	37	55	48	33	55	42	30	55	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	59	59	59	59	59	55	59	59	46	59	53	40	59	45	36	59	40	33	59	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	59	45	36	59	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	65	65	65	65	65	65	65	65	65	65	65	55	65	61	46	65	52	40	65	45	36	65	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	65	61	46	65	50	39	65	42	34	65	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	67*	69*	69*	59	69*	69*	51	69*	64*	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	69*	69*	59	69*	68*	49	69*	60	42	64*	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
50	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	32	42	40	28	42	35	25
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	32	42	39	28	42	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	37	46	39	32	46	34	28	46	30	25	41	27	22
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	37	46	41	34	46	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	49	58*	50	39	58*	41	32	58*	36	27	58*	32	24
			Exposed	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	56*	58*	58*	47	58*	54*	41	58*	42	33	58*	36	27	55*	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	50*	60*	57*	41	58*	47	35	47	40	30
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	53*	60*	58*	41	56*	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	35	42	42	30	42	36	26	42	32	22	38	28	30	34	25	26
			Exposed	42	42	42	42	42	42	42	42	39	42	42	35	42	42	32	42	41	29	42	38	27	42	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	39	46	45	36	46	37	30	46	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	46	46	44	46	46	39	46	42	35	46	38	31	46	34	28	46	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	54*	58*	58*	46	58*	46	36	58*	38	29	58*	33	24	51*	29	21	44	25	27	39	23	23
			Exposed	58*	58*	58*	58*	58*	51*	58*	56*	43	58*	48	37	58*	41	33	58*	38	29	58*	34	26	52*	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	59*	60*	60*	45	60*	51*	37	49*	41	31	40	36	26	36	32	23	32	28	20
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	55*	60*	60*	47	60*	58*	41	60*	50*	37	53*	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	41	47	47	38	47	47	34	47	41	29	47	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	47	47	41	47	47	37	47	47	33	47	42	30	47	38	27	47	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	50	50	50	50	50	50	50	50	46	50	50	40	50	45	36	50	40	33	50	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	50	45	36	50	39	32	50	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	55	61*	61*	46	61*	52	40	61*	45	36	61*	37	29	58*	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	61*	61*	46	61*	50	39	61*	42	34	61*	38	30	61*	35	26	57*	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	59*	62*	62*	51	62*	62*	45	61*	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	62*	62*	59*	62*	62*	49	62*	60*	42	62*	51	37	54*	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	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	32	35	35	28	35	35	25
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	28	35	34	24	35	29	31	35	26	28	32	23	25
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	32	38	34	28	38	30	25	38	27	22
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	34	38	34	28	38	29	24	38	25	32	34	22	28	30	30	25	27	26	22
		20-27	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*	49*	52*	50*	39	52*	41	32	52*	36	27	52*	32	24
			Exposed	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	47*	52*	52*	41	52*	42	33	52*	36	27	52*	31	22	47*	27	19	40	24	25	36	32	22
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	62*	67*	67*	53	67*	61*	46
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	51	66*	58	43	57	51	37	50	45	32	45	40	28	45	40	28
	C	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	30	35	35	26	35	32	22	35	28	30	34	25	26
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	29	35	35	27	35	32	23	35	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	37	30	38	32	26	38	27	23	37	24	30	32	32	26	29	28	23
			Exposed	38	38	38	38	38	38	38	38	35	38	38	31	38	34	28	38	31	26	38	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	46*	52*	46*	36	52*	38	29	52*	33	24	51*	29	21	44*	25	27	39	23	23
			Exposed	52*	52*	52*	52*	52*	51*	52*	52*	43*	52*	48*	37	52*	41	33	52*	38	29	52*	34	26	52*	29	21	43*	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	56	67*	63*	47	61*	55	40	54	48	34	48	43	30
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	62*	67*	67*	55	67*	66*	50	62*	55	41	53	47	34	46	41	28	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	34	39	39	29	39	35	25	39	30	21	36	26	28	32	23	25	28	31	22
			Exposed	39	39	39	39	39	37	39	39	33	39	39	30	39	38	27	39	35	24	39	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	40	42	42	36	42	40	33	42	37	30	42	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	42	42	36	42	39	32	42	35	29	42	32	26	42	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	46	55*	52*	40	55*	45	36	55*	37	29	55*	32	23	48*	28	20	41	24	25	36	32	22	32	29	20
			Exposed	55*	55*	46	55*	50*	39	55*	42	34	55*	38	30	55*	35	26	55*	32	23	51*	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	51*	58*	58*	45*	58*	49*	36	47*	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	58*	58*	58*	58*	58*	49*	58*	58*	42	58*	51*	37	54*	44	33	46*	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
70	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	28	31	31	25
			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	28	31	31	24	31	29	31	31	26	28	31	23	25
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	28	33	30	25	33	27	22
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	29	24	33	25	32	33	22	28	30	30	25	27	26	22
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	58*	63*	62*	49	63*	55	42	63*	49	36
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	62*	63*	63*	50	63*	54	41	63*	46	34	63*	41	28	61*	36	25	54	32	22
		27-45	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	61*	63*	63*	53*	63*	61*	45
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	51	63*	58*	43	57*	51	37	50	45	32	44	40	28
	C	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	30	31	31	26	31	31	22	31	28	30	31	25	26
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	27	31	31	23	31	27	29	31	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	32	26	33	27	23	33	24	30	32	32	26	29	28	23
			Exposed	33	33	33	33	33	33	33	33	33	33	33	31	33	33	28	33	31	26	33	29	24	33	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	54	63*	58*	44	63*	50	37	63*	44	31	62*	38	27	58*	34	23
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56*	63*	62*	49	63*	57*	44	63*	52	39	63*	44	32	63*	38	26	56*	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56*	63*	62*	47	61*	55*	40	54*	48	34	48	43	30
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	62*	63*	63*	63*	55*	63*	63*	49	62*	55*	41	53*	47	34	46	41	28	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	29	34	34	25	34	30	21	34	26	28	32	23	25	28	31	22
			Exposed	34	34	34	34	34	34	34	34	33	34	34	30	34	34	27	34	34	24	34	32	22	34	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	36	37	37	33	37	37	30	37	31	26	37	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	37	37	36	37	37	32	37	35	29	37	32	26	37	29	24	37	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	61	68*	67*	54	68*	56	43	68*	48	35	68*	42	30	62*	37	25	55	32	22	49	29	20
			Exposed	68*	68*	68*	68*	68*	59	68*	64*	51	68*	58	45	68*	52	39	68*	48	35	68*	44	31	63*	37	25	54	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	55	66*	61*	45	59*	52	38	51	46	33	45	40	28	40	36	24
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	64*	66*	66*	56	66*	66*	50	66*	60*	45	61*	55	40	52	46	33	44	40	27	38	34	23	34	30	20	30	27	17	26	24	15
80	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	31	27	26	28	27	23	25
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	51	42	53	45	37	53	40	33
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	51	53	52	43	53	44	37	53	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	58*	59*	59*	49	59*	55*	42	59*	49	36
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	50*	59*	54*	41	59*	46	34	59*	41	28	59*	36	25	54*	32	22
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	52*	59*	59*	45
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	51*	59*	58*	43	57*	51*	37	50*	45	32	44	40	28
	C	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	27	27	22	27	27	30	27	25	26
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	29	27	24	25	27	31	22	25	28	20	22	24	17
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	48	39	53	41	34	53	36	30	49	32	26	43	28	23
			Exposed	53	53	53	53	53	53	53	53	52	53	53	47	53	52	43	53	47	39	53	43	36	53	36	30	48	31	26	41	27	22	36	24	20	32	21	17	28	19	15
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	54*	59*	58*	44	59*	50*	37	59*	44	31	59*	38	27	58*	34	23
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	49	59*	57*	44	59*	52*	39	59*	44	32	59*	38	26	56*	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	47*	59*	55*	40	54*	48*	34	48*	43	30
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	55*	59*	59*	50*	59*	55*	41	53*	48*	34	46	41	28	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	25	30	30	21	30	26	28	30	23	25	28	31	22
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	27	29	30	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	31	26	32	26	22	32	23	29	31	30	25	27	27	22	24	24	20
			Exposed	32	32	32	32	32	32	32	32	29	32	32	26	32	29	24	32	26	22	32	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	54	62*	56*	43	62*	48	35	62*	42	30	61*	37	25	55*	32	22	49	29	20
			Exposed	62*	62*	62*	62*	62*	59*	62*	62*	51	62*	58*	45	62*	52	39	62*	48	35	62*	44	31	62*	37	25	54	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	61*	45	58*	53*	38	51	46	33	45	40	28	40	36	24
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56*	62*	62*	50	62*	60*	45	61*	55*	40	52*	46	33	44	40	27	38	34	23	34	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	31	24	24	28	24	23	25
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	45	37	48	40	33
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	44	37	48	38	32	48	34	28	45	30	25	40	26	22
		20-27	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	49*	53*	53*	42	53*	49*	36
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	50*	53*	53*	41	53*	46*	34	53*	41	28	53*	36	25	53*	32	22
		27-45	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	53*	56*	56*	46*
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	43*	56*	51*	37	50*	45*	32	45*	40	28						
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	30	24	24	26
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	29	24	24	25	24	31	22	24	28	20	22	24	17
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	39	48	41	34	48	36	30	48	32	26	43	28	23
			Exposed	48	48	48	48	48	48	48	48	48	48	48	47	48	48	43	48	47	39	48	43	36	48	36	30	48	31	26	41	27	22	36	24	20	32	21	17	28	19	15
		20-27	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	44	53*	50*	37	53*	44	31	53*	38	27	53*	38	27	53*	34	23
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	49*	53*	53*	44	53*	52*	39	53*	44	32	53*	38	26	53*	33	22	49*	29	20	43	25	17	38	22	15
		27-45	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	47*	56*	55*	40	54*	48*	35	48*	43*	30
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	55*	56*	56*	50*	56*	55*	41	53*	47*	34	46*	41	29	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	21	27	26	28	27	23	25	27	31	22
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	22	27	27	29	27	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	46	53	47	39	53	40	33	53	35	29	46	30	25	41	27	22	36	24	20
			Exposed	53	53	53	53	53	49	53	53	44	53	48	40	53	43	36	53	40	33	53	36	30	47	31	25	40	26	22	35	23	19	30	20	16	27	18	14	24	16	13
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	54*	59*	56*	43	59*	48	35	59*	42	30	58*	37	25	55*	32	22	49*	29	20
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	51*	59*	58*	45	59*	52*	39	59*	48	35	59*	44	31	59*	37	25	54*	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	55*	59*	59*	45	58*	52*	38	51*	46	33	45	40	28	40	36	24
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	50*	59*	59*	45	59*	55*	40	52*	47*	33	44	40	27	38	34	23	34	30	20	30	27	17	26	24	15
100	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31	22	22	28	22	22	25
		7-20	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	37	39	39	33
			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	37	39	38	32	39	34	28	39	30	25	39	26	22
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	49*	54*	54*	42*	54*	49*	36
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	41*	54*	46*	34	54*	41*	28	54*	36	25	54*	32	22
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	52*	53*	53*	45*
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	43*	53*	51*	37	50*	45*	32	44*	40*	28			
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	30	22	22	26
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	29	22	22	25	22	31	22	22	28	20	22	24	17
		7-20	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	34	39	36	30	39	32	26	39	28	23
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	36	30	39	31	26	39	27	22	36	24	20	32	21	17	28	19	15
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	44*	54*	50*	37	54*	44*	31	54*	38	27	54*	34	23
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	49*	54*	54*	44*	54*	52*	39	54*	44*	32	54*	38	26	54*	33	22	49*	29	20	43*	25	17	38	22	15
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	47*	53*	53*	40*	52*	48*	34	48*	43*	30
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	49*	53*	53*	41*	53*	47*	34	46*	41*	28	40*	36	24	35	32	21	31	28	18
	D	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	28	24	23	25	24	31	22
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	29	24	23	25	24	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	47	39	48	40	33	48	35	29	46	30	25	41	27	22	36	24	20
			Exposed	48	48	48	48	48	48	48	48	44	48	48	40	48	43	36	48	40	33	48	36	30	47	31	25	40	26	22	35	23	19	30	20	16	27	18	14	24	16	13
		20-27	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	43	53*	48*	35	53*	42	30	53*	37	25	52*	32	22	49*	29	20
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	45*	53*	52*	39	53*	48*	35	53*	44	31	53*	37	25	53*	32	22	47*	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	55*	56*	56*	45*	56*	53*	38	51*	46*	33	45*	41	28	40	36	24
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	50*	56*	56*	45*	56*	55*	40	52*	46*	33	44*	40	27	39	35	23	34	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	98	98	98	94	98	98	90	98	98	86	98	96	83	98	89	77	96	83	70	90	78	61	84	73	54	80	67	47	76	59	42
			Exposed	98	98	90	98	98	85	98	94	81	98	90	78	98	86	74	95	83	69	91	79	64	85	74	54	79	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	99	99	99	99	99	99	99	99	96	99	99	91	99	95	87	99	91	83	99	87	80	92	80	73	86	75	63	81	66	54	77	57	47	73	50	42	68	45	37
			Exposed	99	95	87	99	90	82	99	85	78	92	81	74	89	77	68	86	74	62	83	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	98	99	99	93	99	95	89	99	87	82	98	81	76	91	76	67	87	69	55	82	61	46	79	54	40
			Exposed	99	99	98	99	98	92	99	93	87	99	88	82	99	84	79	97	81	75	93	77	70	87	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97	100	100	93	100	96	86	97	89	80	90	84	75	84	79	69	79	74	59	75	68	51
			Exposed	100	100	100	100	100	96	100	100	92	100	97	87	100	93	83	97	89	80	92	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	98	98	93	98	98	88	98	97	84	98	93	80	98	89	77	98	85	73	94	82	69	87	76	58	82	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	98	88	77	97	84	72	92	80	66	88	77	60	85	73	54	81	69	49	78	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	99	99	90	99	93	85	99	88	81	97	84	77	91	80	72	88	77	67	85	73	61	80	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	91	80	72	87	76	65	84	70	58	80	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	99	99	99	99	99	95	99	96	90	99	91	85	99	87	81	99	83	78	96	80	74	89	74	61	84	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	99	87	81	99	82	77	94	78	72	90	75	64	87	69	55	84	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	100	100	100	100	100	100	100	100	95	100	100	90	100	96	86	100	92	83	96	88	79	88	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	100	95	86	99	91	82	93	86	78	89	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	98	98	86	98	94	81	98	90	78	98	86	74	95	82	69	91	79	63	87	76	58	81	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	94	82	69	90	78	62	86	75	55	82	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	99	90	82	99	85	78	92	81	74	89	77	68	85	73	61	82	68	56	79	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	85	73	61	81	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	99	98	92	99	93	87	99	88	82	99	84	78	97	80	75	92	77	69	89	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	96	80	74	91	76	67	88	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	100	100	97	100	100	92	100	97	87	100	92	83	96	88	80	91	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	96	88	79	90	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
10	B	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	88	83	88	88	77	88	83	70	88	78	61	84	73	54	80	67	47	76	59	42
			Exposed	88	88	88	88	88	85	88	88	81	88	88	78	88	86	74	88	83	69	88	79	64	85	74	54	79	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	88	83	88	87	80	88	80	73	86	75	63	81	66	54	77	57	47	73	50	42	68	45	37
			Exposed	88	88	87	88	88	82	88	85	78	88	81	74	88	77	68	86	74	62	83	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	95	89	96	87	82	96	81	76	91	76	67	87	69	55	82	61	46	79	54	40
			Exposed	96	96	96	96	96	92	96	93	87	96	88	82	96	84	79	96	81	75	93	77	70	87	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	98	98	93	98	96	86	97	89	80	90	84	75	84	79	69	79	74	59	75	68	51
			Exposed	98	98	98	98	98	96	98	98	92	98	97	87	98	93	83	97	89	80	92	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	88	88	88	88	88	88	88	88	84	88	88	80	88	88	77	88	85	73	88	82	69	87	76	58	82	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	88	88	77	88	84	72	88	80	66	88	77	60	85	73	54	81	69	49	78	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	88	88	88	88	88	85	88	88	81	88	84	77	88	80	72	88	77	67	85	73	61	80	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	88	80	72	87	76	65	84	70	58	80	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	96	96	96	96	96	95	96	96	90	96	91	85	96	87	81	96	83	78	96	80	74	89	74	61	84	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	96	87	81	96	82	77	94	78	72	90	75	64	87	69	55	84	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	98	98	98	98	98	98	98	98	95	98	98	90	98	96	86	98	92	83	96	88	79	88	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	98	95	86	98	91	82	93	86	78	89	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	88	88	86	88	88	81	88	88	78	88	86	74	88	82	69	88	79	63	87	76	58	81	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	88	82	69	88	78	62	86	75	55	82	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	88	88	82	88	85	78	88	81	74	88	77	68	85	73	61	82	68	56	79	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	85	73	61	81	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	97	97	92	97	93	87	97	88	82	97	84	78	97	80	75	92	77	69	89	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	96	80	74	91	76	67	88	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	99	99	97	99	99	92	99	97	87	99	92	83	96	88	80	91	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	96	88	79	90	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
20	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	70	78	78	70	78	78	61	78	73	54	78	67	47	76	59	42
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	64	78	74	54	78	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	75	63	78	66	54	77	57	47	73	50	42	68	45	37
			Exposed	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	62	78	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	82	89	81	76	89	76	67	87	69	55	82	61	46	79	54	40
			Exposed	89	89	89	89	89	89	89	89	87	89	88	82	89	84	79	89	81	75	89	77	70	87	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	86	92	89	80	90	84	75	84	79	69	79	74	59	75	68	51
			Exposed	92	92	92	92	92	92	92	92	92	92	92	87	92	92	83	92	89	80	92	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	73	78	78	69	78	76	58	78	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	78	78	77	78	78	72	78	78	66	78	77	60	78	73	54	78	69	49	78	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	77	78	78	72	78	77	67	78	73	61	78	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	78	78	72	78	76	65	78	70	58	78	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	89	89	89	89	89	89	89	89	89	89	89	85	89	87	81	89	83	78	89	80	74	89	74	61	84	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	89	87	81	89	82	77	89	78	72	89	75	64	87	69	55	84	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	90	92	92	86	92	92	83	92	88	79	88	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	92	92	86	92	91	82	92	86	78	89	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	63	78	76	58	78	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	78	78	69	78	78	62	78	75	55	78	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	78	78	78	78	78	78	78	78	74	78	77	68	78	73	61	78	68	56	78	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	78	73	61	78	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	90	90	90	90	90	87	90	88	82	90	84	78	90	80	75	90	77	69	89	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	90	80	74	90	76	67	88	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	93	93	93	93	93	92	93	93	87	93	92	83	93	88	80	91	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	93	88	79	90	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	70	77	77	61	77	73	54	77	67	47	76	59	42
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	69	77	77	64	77	74	54	77	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	75	63	78	66	54	77	57	47	73	50	42	68	45	37
			Exposed	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	62	78	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	83	81	76	83	76	67	83	69	55	82	61	46	79	54	40
			Exposed	83	83	83	83	83	83	83	83	83	83	83	82	83	83	79	83	81	75	83	77	70	83	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	80	87	84	75	84	79	69	79	74	59	75	68	51
			Exposed	87	87	87	87	87	87	87	87	87	87	87	87	87	87	83	87	87	80	87	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	69	77	76	58	77	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	77	77	77	77	77	72	77	77	66	77	77	60	77	73	54	77	69	49	77	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	77	78	78	72	78	77	67	78	73	61	78	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	78	78	72	78	76	65	78	70	58	78	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	83	78	83	80	74	83	74	61	83	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	83	83	81	83	82	77	83	78	72	83	75	64	83	69	55	83	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	83	87	87	79	87	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	87	87	86	87	87	82	87	86	78	87	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	63	78	76	58	78	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	78	78	69	78	78	62	78	75	55	78	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	78	78	78	78	78	78	78	78	74	78	77	68	78	73	61	78	68	56	78	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	78	73	61	78	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	85	85	85	85	85	85	85	85	82	85	84	78	85	80	75	85	77	69	85	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	85	80	74	85	76	67	85	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	88	88	88	88	88	88	88	88	87	88	88	83	88	88	80	88	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	88	88	79	88	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	61	71	71	54	71	67	47	71	59	42
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	64	71	71	54	71	66	46	71	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	63	74	66	54	74	57	47	73	50	42	68	45	37
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	74	62	74	69	57	74	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	76	67	79	69	55	79	61	46	79	54	40
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	77	70	79	70	55	79	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	83	75	82	79	69	79	74	59	75	68	51
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	83	77	83	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	58	71	69	50	71	61	43	71	53	38	64	47	50	57	42	45
			Exposed	71	71	71	71	71	71	71	71	66	71	71	60	71	71	54	71	69	49	71	64	45	71	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	67	74	73	61	74	62	51	74	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	74	74	72	74	74	65	74	70	58	74	64	53	74	58	48	74	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	74	79	74	61	79	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	79	79	79	79	79	77	79	78	72	79	75	64	79	69	55	79	63	49	79	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	79	82	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	83	83	83	83	83	82	83	83	78	83	82	74	83	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	74	63	74	74	58	74	68	49	74	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	74	74	69	74	74	62	74	74	55	74	69	50	74	64	45	74	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	76	76	76	76	76	76	76	76	74	76	76	68	76	73	61	76	68	56	76	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	76	73	61	76	66	54	76	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	78	81	80	75	81	77	69	81	73	60	81	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	81	80	74	81	76	67	81	71	57	81	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	83	85	85	80	85	85	76	84	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	85	85	79	85	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
50	B	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	54	65	65	47	65	59	42
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	54	65	65	46	65	57	40	65	50	53	60	44	47	53	39	42
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	66	54	67	57	47	67	50	42	67	45	37
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	57	67	58	48	67	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	67	75	69	55	75	61	46	75	54	40
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	70	55	75	60	45	75	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	74	59	75	68	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	58	65	65	50	65	61	43	65	53	38	64	47	50	57	42	45
			Exposed	65	65	65	65	65	65	65	65	65	65	65	60	65	65	54	65	65	49	65	64	45	65	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	62	51	67	53	44	67	46	38	62	40	50	54	36	44	48	48	39
			Exposed	67	67	67	67	67	65	67	67	58	67	64	53	67	58	48	67	53	43	67	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	74	61	75	64	50	75	56	41	75	49	35	70	43	30	65	38	39
			Exposed	75	75	75	75	75	75	75	75	72	75	75	64	75	69	55	75	63	49	75	58	44	75	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	74	59	75	68	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	74	77	77	69	77	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	63	68	68	58	68	68	49	68	59	42	68	51	36	61	45	48	54	39	42	48	53	37
			Exposed	68	68	68	68	68	62	68	68	55	68	68	50	68	64	45	68	58	41	68	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	68	71	71	61	71	68	56	71	62	51	71	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	71	71	61	71	66	54	71	59	49	71	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	73	60	77	63	48	77	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	77	77	74	77	76	67	77	71	57	77	64	50	77	58	44	77	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	76	80	80	73	79	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	81	81	79	81	81	76	81	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	47	59	59	42
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	46	59	57	40	59	50	53	59	44	47	53	39	42
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	54	62	57	47	62	50	42	62	45	37
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	58	48	62	50	41	62	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	81	76	85	77	69
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	80	75	85	75	66	85	68	52	82	60	42	78	54	37
		27-45	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*	85	74*	74*	81	74*	84	77
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	86	74*	87	80	87	83	75	84	78	68	79	74	58	74	67	48
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	58	59	59	50	59	59	43	59	53	38	59	47	50	57	42	45
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	49	59	59	45	59	54	38	59	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	51	62	53	44	62	46	38	62	40	50	54	36	44	48	48	39
			Exposed	62	62	62	62	62	62	62	62	58	62	62	53	62	58	48	62	53	43	62	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	83	78	85	78	71	85	72	59	84	65	47	80	57	39
			Exposed	85	85	85	85	85	85	85	85	85	85	85	84	85	85	81	85	83	77	85	79	73	85	73	60	83	63	45	79	55	38	75	48	33	70	42	29	64	38	26
		27-45	Interior	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	87	74*	74*	83	74*	85	77	83	81	72	81	76	64	77	71	53
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	86	74*	74*	82	74*	87	79	87	81	72	81	76	62	75	69	50	68	60	41	59	53	35	53	47	31
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	62	49	62	59	42	62	51	36	61	45	48	54	39	42	48	53	37
			Exposed	62	62	62	62	62	62	62	62	55	62	62	50	62	62	45	62	58	41	62	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	56	65	62	51	65	52	43	65	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	65	65	61	65	65	54	65	59	49	65	53	44	65	48	40	65	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	73	60	74	63	48	74	54	40	73	47	33	68	41	43	61	36	37	54	48	33
			Exposed	74	74	74	74	74	67	74	71	57	74	64	50	74	58	44	74	53	39	74	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	61	74	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	74	74	74	74	74	74	74	74	70	74	74	63	74	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
70	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	42
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	50	53	51	44	47	51	39	42
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	47	56	50	42	56	45	37
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	48	56	50	41	56	43	36	56	38	47	50	50	41	45	44	37
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	77	69
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	75	66	79	68	52	79	60	42	78	54	37
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	75	81	78	68	79	73	57	74	67	48
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	43	51	51	38	51	47	50	51	42	45
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	45	51	51	38	51	46	49	51	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	51	56	53	44	56	46	38	56	40	50	54	36	44	48	48	39
			Exposed	56	56	56	56	56	56	56	56	56	56	56	53	56	56	48	56	53	43	56	48	40	56	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	78	71	79	72	59	79	65	47	79	57	39
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	79	73	79	73	60	79	63	45	79	55	38	75	48	33	70	43	29	64	38	26
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	81	72	79	76	64	77	71	53
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	79	81	81	72	81	76	62	75	69	50	68	60	41	59	53	35	53	47	31
	D	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	49	57	57	42	57	51	36	57	45	48	54	39	42	48	53	37
			Exposed	57	57	57	57	57	57	57	57	55	57	57	50	57	57	45	57	57	41	57	53	38	57	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	56	60	60	51	60	52	43	60	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	60	60	60	60	60	54	60	59	49	60	53	44	60	48	40	60	44	36	60	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	84	82	77	84	77	69	84	70	54	82	62	43	79	54	37	75	48	33
			Exposed	84	84	84	84	84	84	84	81	84	83	78	84	80	74	84	76	68	84	72	59	83	62	44	78	53	37	73	46	32	68	40	28	61	36	25	54	32	22
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	84	84	76	82	79	70	79	75	59	75	68	49	68	60	41
			Exposed	85	85	85	85	85	85	85	85	85	85	85	83	85	85	79	85	84	76	85	81	72	80	75	60	74	67	48	65	58	39	57	51	33	50	45	29	44	40	25
80	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	45	53	45	44	47	45	39	42
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	63	73	68	56
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	73	73	62	73	65	54	73	57	47	72	50	41	67	44	37
		20-27	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	76	76	76	76	76	76	76	76	76	76	76	76	69
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	76	75	66	76	75	66	76	68	52	76	60	42	76	54	37
		27-45	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	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	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	76	76	76	75	76	76	68	76	73	57	74	67	48
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	38	45	45	50	45	42	45
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	38	45	45	45	45	45	49	45	40	43	45	53	37	42	46	33	37	41	29
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	67	73	69	58	73	61	50	73	54	44	70	48	39
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	66	73	72	60	73	61	51	73	53	44	68	46	38	61	40	33	54	35	29	48	31	26
		20-27	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	76	76	76	71	76	72	59	76	65	47	76	57	39
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	73	60	76	63	45	76	55	38	75	48	33	70	43	29	64	38	26
		27-45	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	76	76	76	76	76	76	72	76	76	64	76	71	53
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	76	62	75	69	50	68	60	41	59	53	35	53	47	31
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	42	50	50	36	50	45	48	50	39	42	48	53	37
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	41	50	50	38	50	45	48	50	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	52	43	54	45	37	54	39	48	52	51	42	45	45	37	40	40	33
			Exposed	54	54	54	54	54	54	54	54	49	54	53	44	54	48	40	54	44	36	54	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	77	69	79	70	54	79	62	43	78	54	37	75	48	33
			Exposed	79	79	79	79	79	79	79	79	79	79	78	79	79	74	79	76	68	79	72	59	79	62	44	78	53	37	73	46	32	68	40	28	61	36	25	54	32	22
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	80	79	70	78	75	59	75	68	49	68	60	41
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	80	76	80	80	72	80	75	60	74	67	48	65	58	39	57	51	33	50	45	29	44	40	25

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UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	53	40	40	47	40	39	42
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	56
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	54	65	57	47	65	50	41	65	44	37
		20-27	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*	69
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	66	74*	68	52	74*	60	42	74*	54	37
		27-45	Interior	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~
			Exposed	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~48~~
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	50	40	40	45
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	49	40	40	43	40	53	37	40	46	33	37	41	29
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	58	65	61	50	65	54	44	65	48	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	61	51	65	53	44	65	46	38	61	40	33	54	35	29	48	31	26
		20-27	Interior	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	73	74*	73	60	74*	63	45	74*	55	38	74*	48	33	70	43	29	64	38	26
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	73	74*	73	60	74*	63	45	74*	55	38	74*	48	33	70	43	29	64	38	26
		27-45	Interior	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~71*~~	~~54~~
			Exposed	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~63~~	~~72*~~	~~69~~	~~50~~	~~68~~	~~60~~	~~41~~	~~60~~	~~53~~	~~35~~	~~53~~	~~47~~	~~31~~
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	36	45	45	48	45	39	42	45	53	37
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	41	45	45	38	45	45	48	45	39	41	45	50	36	40	44	~~31~~	53	39	~~28~~	47	~~35~~	~~25~~
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	65	72	68	56	72	58	48	72	51	42	68	45	37	61	40	~~33~~
			Exposed	72	72	72	72	72	72	72	72	72	72	72	67	72	72	60	72	67	55	72	61	50	72	52	43	67	44	37	58	38	~~32~~	51	~~34~~	~~28~~	45	~~30~~	~~25~~	40	~~26~~	~~22~~
		20-27	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	69	76	70	54	76	62	43	76	54	37	75	48	33
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	76	76	68	76	72	59	76	62	44	76	53	37	73	46	32	68	40	~~28~~	61	36	~~25~~	54	~~32~~	~~22~~
		27-45	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	76	76	76	70	76	75	59	75	68	49	68	60	41
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	75	60	74	67	48	65	58	39	57	51	33	50	45	29	44	40	~~25~~
100	B	0-7	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
			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	53	36	36	47	36	36	42
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	54	62	57	47	62	50	41	62	44	37
		20-27	Interior	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~69*~~
			Exposed	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~66~~	~~70*~~	~~68*~~	~~52~~	~~70*~~	~~60~~	~~42~~	~~70*~~	~~54~~	~~37~~
		27-45	Interior	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~
			Exposed	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~68*~~	~~69*~~	~~69*~~	~~57~~	~~69*~~	~~67*~~	~~48~~
	C	0-7	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	50	36	36	45
			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	49	36	36	43	36	53	37	36	46	~~33~~	36	41	~~29~~
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	61	50	62	54	44	62	48	39
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	61	51	62	53	44	62	46	38	61	40	~~33~~	54	~~35~~	~~29~~	48	~~31~~	~~26~~
		20-27	Interior	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~59~~	~~70*~~	~~65~~	~~47~~	~~70*~~	~~57~~	~~39~~
			Exposed	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~60~~	~~70*~~	~~63~~	~~45~~	~~70*~~	~~55~~	~~38~~	~~70*~~	~~48~~	~~33~~	~~70*~~	~~43~~	~~29~~	~~64~~	~~38~~	~~26~~
		27-45	Interior	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~64*~~	~~69*~~	~~69*~~	~~53~~
			Exposed	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~62~~	~~69*~~	~~69*~~	~~50~~	~~68*~~	~~60~~	~~41~~	~~59~~	~~53~~	~~35~~	~~53~~	~~47~~	~~31~~
	D	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	48	40	39	42	40	53	37
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	48	40	39	41	40	50	36	40	44	~~31~~	53	39	~~28~~	47	~~35~~	~~25~~
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	56	65	58	48	65	51	42	65	45	37	61	40	~~33~~
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	65	55	65	61	50	65	52	43	65	44	37	58	38	~~32~~	51	~~34~~	~~28~~	45	~~30~~	~~25~~	40	~~26~~	~~22~~
		20-27	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*	69	74*	70	54	74*	62	43	74*	54	37	74*	48	33
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	68	74*	72	59	74*	62	44	74*	53	37	73	46	32	68	40	~~28~~	61	36	~~25~~	54	~~32~~	~~22~~
		27-45	Interior	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~70*~~	~~72*~~	~~72*~~	~~60~~	~~72*~~	~~68~~	~~49~~	~~68~~	~~61~~	~~42~~
			Exposed	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~61~~	~~72*~~	~~67~~	~~48~~	~~65~~	~~58~~	~~39~~	~~57~~	~~51~~	~~34~~	~~50~~	~~45~~	~~29~~	~~44~~	~~40~~	~~25~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	75	78	78	70	78	78	66	78	76	58	78	69	44	76	58	35	70	47	31	61	39	27	51	33	23	43	29	31
			Exposed	78	78	70	78	78	64	78	74	54	78	70	46	78	65	40	75	57	35	71	50	32	62	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	~~21~~
		7-20	Interior	78	78	78	78	78	78	78	78	76	78	78	72	78	75	67	78	71	58	78	67	49	72	51	37	65	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	78	75	67	78	70	55	77	64	46	73	53	38	69	45	34	64	38	31	57	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	~~18~~
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	78	74	79	75	69	79	67	54	77	53	41	71	42	32	66	34	27	56	30	23	49	27	20
			Exposed	79	79	77	79	77	72	79	73	67	79	68	56	79	61	47	77	52	40	73	45	34	66	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	~~18~~
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	79	74	79	76	66	77	69	52	70	59	41	61	48	34	48	39	29	39	34	25
			Exposed	79	79	79	79	79	76	79	79	72	79	77	67	79	73	59	76	69	51	73	63	44	62	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	78	78	73	78	78	68	78	77	60	78	73	51	78	68	44	77	63	38	75	55	34	67	43	29	55	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	78	68	44	77	60	37	73	52	33	68	45	30	62	39	27	54	35	24	47	32	22	37	27	28	31	23	24	27	30	~~21~~	24	26	~~18~~	32	23	~~16~~	28	~~20~~	~~14~~
		7-20	Interior	78	78	70	78	74	63	78	68	52	76	60	43	71	51	37	68	43	33	62	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	~~19~~
			Exposed	71	50	36	67	41	32	59	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	~~22~~	23	23	~~19~~	30	~~20~~	~~16~~	27	~~17~~	~~14~~	24	~~15~~	~~13~~
		20-27	Interior	79	79	79	79	79	75	79	76	70	79	72	65	79	67	53	79	59	45	76	51	38	69	38	30	60	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	79	67	53	78	56	43	75	47	36	70	40	31	66	35	27	59	32	24	53	29	22	43	24	26	36	21	22	31	27	~~19~~	27	24	~~16~~	24	~~21~~	~~14~~	32	~~19~~	~~13~~
		27-45	Interior	79	79	79	79	79	78	79	79	75	79	79	70	79	76	66	78	72	57	76	68	49	68	54	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	79	76	66	78	71	55	74	66	46	69	56	39	62	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	~~17~~	26	23	~~15~~
	D	0-7	Interior	78	78	65	78	74	54	78	70	46	78	64	39	75	56	34	71	49	31	67	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	~~21~~	24	26	~~19~~
			Exposed	75	55	34	70	47	31	64	40	27	55	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	~~20~~	23	25	~~18~~	30	22	~~15~~	26	~~19~~	~~14~~	23	~~17~~	~~12~~
		7-20	Interior	78	71	56	77	64	46	73	53	38	68	44	33	63	38	30	56	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	~~21~~	23	22	~~18~~	30	~~20~~	~~16~~
			Exposed	62	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	~~25~~	26	26	~~21~~	22	22	~~18~~	29	~~19~~	~~16~~	25	~~17~~	~~14~~	22	~~15~~	~~12~~	~~20~~	~~13~~	~~11~~
		20-27	Interior	79	77	73	79	73	67	79	68	56	79	60	46	76	51	39	73	44	34	69	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	~~18~~	27	24	~~16~~
			Exposed	76	51	38	71	42	32	67	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	~~18~~	26	23	~~16~~	23	~~20~~	~~14~~	30	~~18~~	~~12~~	27	~~16~~	~~11~~
		27-45	Interior	79	79	76	79	79	72	79	76	67	79	73	58	76	68	50	72	62	43	68	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	76	68	49	71	59	41	65	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	~~19~~	28	25	~~16~~	25	22	~~14~~	22	~~20~~	~~12~~
10	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	67	58	67	67	44	67	58	35	67	47	31	61	39	27	51	33	23	43	29	31
			Exposed	67	67	67	67	67	64	67	67	54	67	67	46	67	65	40	67	57	35	67	50	32	62	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	~~21~~
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	68	68	58	68	67	49	68	51	37	65	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	68	68	67	68	68	55	68	64	46	68	53	38	68	45	34	64	38	31	57	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	~~18~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	75	69	77	67	54	77	53	41	71	42	32	66	34	27	56	30	23	49	27	20
			Exposed	77	77	77	77	77	72	77	73	67	77	68	56	77	61	47	77	52	40	73	45	34	66	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	~~18~~
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	74	78	76	66	77	69	52	70	59	41	61	48	34	48	39	29	39	34	25
			Exposed	78	78	78	78	78	76	78	78	72	78	77	67	78	73	59	76	69	51	73	63	44	62	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	67	67	67	67	67	67	67	67	60	67	67	51	67	67	44	67	63	38	67	55	34	67	43	29	55	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	67	67	44	67	60	37	67	52	33	67	45	30	62	39	27	54	35	24	47	32	22	37	27	28	31	23	24	27	30	~~21~~	24	26	~~18~~	32	23	~~16~~	28	~~20~~	~~14~~
		7-20	Interior	68	68	68	68	68	63	68	68	52	68	60	43	68	51	37	68	43	33	62	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	~~19~~
			Exposed	68	50	36	67	41	32	59	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	~~22~~	23	23	~~19~~	30	~~20~~	~~16~~	27	~~17~~	~~14~~	24	~~15~~	~~13~~
		20-27	Interior	77	77	77	77	77	75	77	76	70	77	72	65	77	67	53	77	59	45	76	51	38	69	38	30	60	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	77	67	53	77	56	43	75	47	36	70	40	31	66	35	27	59	32	24	53	29	22	43	24	26	36	21	22	31	27	~~19~~	27	24	~~16~~	24	~~21~~	~~14~~	32	~~19~~	~~13~~
		27-45	Interior	78	78	78	78	78	78	78	78	75	78	78	70	78	76	66	78	72	57	76	68	49	68	54	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	78	76	66	78	71	55	74	66	46	69	56	39	62	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	~~17~~	26	23	~~15~~
	D	0-7	Interior	67	67	65	67	67	54	67	67	46	67	64	39	67	56	34	67	49	31	67	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	~~21~~	24	26	~~19~~
			Exposed	67	55	34	67	47	31	64	40	27	55	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	~~20~~	23	25	~~18~~	30	22	~~15~~	26	~~19~~	~~14~~	23	~~17~~	~~12~~
		7-20	Interior	68	68	56	68	64	46	68	53	38	68	44	33	63	38	30	56	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	~~21~~	23	22	~~18~~	30	~~20~~	~~16~~
			Exposed	62	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	~~25~~	26	26	~~21~~	22	22	~~18~~	29	~~19~~	~~16~~	25	~~17~~	~~14~~	22	~~15~~	~~12~~	~~20~~	~~13~~	~~11~~
		20-27	Interior	77	77	73	77	73	67	77	68	56	77	60	46	76	51	39	73	44	34	69	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	~~18~~	27	24	~~16~~
			Exposed	76	51	38	71	42	32	67	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	~~18~~	26	23	~~16~~	23	~~20~~	~~14~~	30	~~18~~	~~12~~	27	~~16~~	~~11~~
		27-45	Interior	79	79	76	79	79	72	79	76	67	79	73	58	76	68	50	72	62	43	68	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	76	68	49	71	59	41	65	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	~~19~~	28	25	~~16~~	25	22	~~14~~	22	~~20~~	~~12~~
20	B	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	44	54	54	35	54	47	31	54	39	27	51	33	23	43	29	31
			Exposed	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	54	35	54	50	32	54	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	~~21~~
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	51	37	54	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	54	54	54	54	54	54	54	54	46	54	53	38	54	45	34	54	38	31	54	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	~~18~~
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	54	69	53	41	69	42	32	66	34	27	56	30	23	49	27	20
			Exposed	69	69	69	69	69	69	69	69	67	69	68	56	69	61	47	69	52	40	69	45	34	66	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	~~18~~
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	66	73	69	52	70	59	41	61	48	34	48	39	29	39	34	25
			Exposed	73	73	73	73	73	73	73	73	72	73	73	67	73	73	59	73	69	51	73	63	44	62	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	51	54	54	44	54	54	38	54	54	34	54	43	29	54	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	54	54	44	54	54	37	54	52	33	54	45	30	54	39	27	54	35	24	47	32	22	37	27	28	31	23	24	27	30	~~21~~	24	26	~~18~~	32	23	~~16~~	28	~~20~~	~~14~~
		7-20	Interior	54	54	54	54	54	54	54	54	52	54	54	43	54	51	37	54	43	33	54	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	~~19~~
			Exposed	54	50	36	54	41	32	54	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	~~22~~	23	23	~~19~~	30	~~20~~	~~16~~	27	~~17~~	~~14~~	24	~~15~~	~~13~~
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	65	69	67	53	69	59	45	69	51	38	69	38	30	60	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	69	67	53	69	56	43	69	47	36	69	40	31	66	35	27	59	32	24	53	29	22	43	24	26	36	21	22	31	27	~~19~~	27	24	~~16~~	24	~~21~~	~~14~~	32	~~19~~	~~13~~
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	70	73	73	66	73	72	57	73	68	49	68	54	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	73	73	66	73	71	55	73	66	46	69	56	39	62	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	~~17~~	26	23	~~15~~
	D	0-7	Interior	54	54	54	54	54	54	54	54	46	54	54	39	54	54	34	54	49	31	54	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	~~21~~	24	26	~~19~~
			Exposed	54	54	34	54	47	31	54	40	27	54	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	~~20~~	23	25	~~18~~	30	22	~~15~~	26	~~19~~	~~14~~	23	~~17~~	~~12~~
		7-20	Interior	54	54	54	54	54	46	54	53	38	54	44	33	54	38	30	54	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	~~21~~	23	22	~~18~~	30	~~20~~	~~16~~
			Exposed	54	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	~~25~~	26	26	~~21~~	22	22	~~18~~	29	~~19~~	~~16~~	25	~~17~~	~~14~~	22	~~15~~	~~12~~	~~20~~	~~13~~	~~11~~
		20-27	Interior	70	70	70	70	70	67	70	68	56	70	60	46	70	51	39	70	44	34	69	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	~~18~~	27	24	~~16~~
			Exposed	70	51	38	70	42	32	67	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	~~18~~	26	23	~~16~~	23	~~20~~	~~14~~	30	~~18~~	~~12~~	27	~~16~~	~~11~~
		27-45	Interior	74	74	74	74	74	72	74	74	67	74	73	58	74	68	50	72	62	43	68	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	74	68	49	71	59	41	65	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	~~19~~	28	25	~~16~~	25	22	~~14~~	22	~~20~~	~~12~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	44	52	52	35	52	47	31	52	39	27	51	33	23	43	29	31
			Exposed	52	52	52	52	52	52	52	52	52	52	52	46	52	52	40	52	52	35	52	50	32	52	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	21
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	51	37	54	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	54	54	54	54	54	54	54	54	46	54	53	38	54	45	34	54	38	31	54	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	18
		20-27	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	54	62	53	41	62	42	32	62	34	27	56	30	23	49	27	20
			Exposed	62	62	62	62	62	62	62	62	62	62	62	56	62	61	47	62	52	40	62	45	34	62	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	18
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	66*	67*	67*	52	67*	59	41	62*	48	34	48	39	29	39	34	25
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	59	67*	67*	51	67*	64*	44	63*	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	51	52	52	44	52	52	38	52	52	34	52	43	29	52	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	52	52	44	52	52	37	52	52	33	52	45	30	52	39	27	52	35	24	47	32	22	37	27	28	31	23	24	27	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	54	54	54	54	54	54	54	54	52	54	54	43	54	51	37	54	43	33	54	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	19
			Exposed	54	50	36	54	41	32	54	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	22	23	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	53	62	59	45	62	51	38	62	38	30	60	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	62	62	53	62	56	43	62	47	36	62	40	31	62	35	27	59	32	24	53	29	22	43	24	26	36	21	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	66*	67*	67*	57	67*	67*	49	67*	54	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	67*	67*	66*	67*	67*	55	67*	66*	46	67*	56	39	63*	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	17	26	23	15
	D	0-7	Interior	54	54	54	54	54	54	54	54	46	54	54	39	54	54	34	54	49	31	54	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	21	24	26	19
			Exposed	54	54	34	54	47	31	54	40	27	54	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	54	54	54	54	54	46	54	53	38	54	44	33	54	38	30	54	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	54	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	64	64	64	64	64	64	64	64	56	64	60	46	64	51	39	64	44	34	64	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	18	27	24	16
			Exposed	64	51	38	64	42	32	64	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	18	26	23	16	23	20	14	30	18	12	27	16	11
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	58	70*	68*	50	70*	62	43	68*	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	70*	68*	49	70*	59	41	65	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	19	28	25	16	25	22	14	22	20	12
40	B	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	35	43	43	31	43	39	27	43	33	23	43	29	31
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	43	32	43	39	27	43	33	23	40	28	30	34	25	26	30	22	23	26	29	21
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	39	31	46	33	27	46	28	23	39	25	31	34	22	28
			Exposed	46	46	46	46	46	46	46	46	46	46	46	38	46	45	34	46	38	31	46	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	18
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	54*	56*	53*	41	56*	42	32	56*	34	27	56*	30	23	49	27	20
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	47	56*	52*	40	56*	45	34	56*	35	27	55*	30	22	46	26	19	39	22	24	34	30	20	30	27	18
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	52*	60*	59*	41	60*	48	34	49*	39	29	39	34	25
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	59*	60*	60*	51*	60*	60*	44	60*	49*	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	38	43	43	34	43	43	29	43	35	25	43	30	21	37	26	28	32	23	25	28	31	22
			Exposed	43	43	43	43	43	37	43	43	33	43	43	30	43	39	27	43	35	24	43	32	22	37	27	28	31	23	24	27	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	43	46	46	37	46	43	33	46	37	30	46	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	19
			Exposed	46	46	36	46	41	32	46	35	29	46	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	22	23	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	53*	56*	56*	45	56*	51	38	56*	38	30	56*	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	56*	56*	53*	56*	56*	43	56*	47	36	56*	40	31	56*	35	27	56*	32	24	53*	29	22	43	24	26	36	21	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	57*	60*	60*	50*	60*	54*	38	53*	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	60*	60*	60*	60*	60*	55*	60*	60*	46	60*	56*	39	60*	49*	34	52*	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	17	26	23	15
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	39	46	46	34	46	46	31	46	43	29	46	34	24	42	29	31	35	25	27	30	22	24	27	29	21	24	26	19
			Exposed	46	46	34	46	46	31	46	40	27	46	35	25	46	32	22	42	29	31	37	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	49	49	49	49	49	46	49	49	38	49	44	33	49	38	30	49	33	28	49	31	25	41	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	49	37	30	49	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	56	62*	60*	46	62*	51	39	62*	44	34	62*	38	30	59*	31	24	48	27	20	40	23	25	35	31	21	30	27	18	27	24	16
			Exposed	62*	51	38	62*	42	32	62*	35	28	60*	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	18	26	23	16	23	20	14	30	18	12	27	16	11
		27-45	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	58*	63*	63*	50	63*	62*	43	63*	54*	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	63*	63*	49	63*	59*	41	63*	50	35	54*	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	19	28	25	16	25	22	14	22	20	12
50	B	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	31	35	35	27	35	33	23	35	29	31
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	27	35	33	23	35	28	30	34	25	26	30	22	23	26	29	21
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	31	38	33	27	38	28	23	38	25	31	34	22	28
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	31	38	34	28	38	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	18
		20-27	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	61	68*	63	49	68*	52	41	68*	46	35	68*	41	30
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	60	68*	67*	52	68*	52	41	68*	45	34	68*	39	28	59	34	24	51	30	20	45	27	18
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	63*	67*	67*	51	67*	60*	44	60*	51	38
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	66*	67*	67*	52	67*	58	43	55	49	36	47	43	31	42	37	26	37	33	23
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	25	35	30	21	35	26	28	32	23	25	28	31	22
			Exposed	35	35	35	35	35	35	35	35	33	35	35	30	35	35	27	35	35	24	35	32	22	35	27	28	31	23	24	27	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	33	38	37	30	38	31	25	38	26	22	35	23	29	31	30	25	27	27	22	24	24	19
			Exposed	38	38	36	38	38	32	38	35	29	38	32	26	38	29	24	38	26	22	37	24	30	31	30	25	26	26	22	23	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	67*	68*	68*	58	68*	58	45	68*	48	37	68*	42	31	64*	36	26	55	32	22	49	28	19
			Exposed	68*	68*	68*	68*	68*	65*	68*	68*	54	68*	60	47	68*	52	41	68*	48	37	68*	43	33	65*	37	26	54	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	57	67*	64*	47	62*	52	39	51	46	33	45	40	29	40	36	25
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	60*	67*	67*	52	67*	63*	46	66*	55	41	51	46	34	44	40	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	31	39	39	29	39	34	24	39	29	31	35	25	27	30	22	24	27	29	21	24	26	19
			Exposed	39	39	34	39	39	31	39	39	27	39	35	25	39	32	22	39	29	31	37	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	42	42	42	42	42	42	42	42	38	42	42	33	42	38	30	42	33	28	42	31	25	41	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	42	37	30	42	33	27	42	29	24	42	26	22	37	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	46	52*	51*	39	52*	44	34	52*	38	30	52*	31	24	48*	27	20	40	23	25	35	31	21	30	27	18	27	24	16
			Exposed	52*	51*	38	52*	42	32	52*	35	28	52*	32	25	52*	29	22	48*	26	19	43	24	26	35	31	21	30	26	18	26	23	16	23	20	14	30	18	12	27	16	11
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	50*	57*	57*	43	57*	53*	37	51*	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	57*	57*	49*	57*	57*	41	57*	50*	35	53*	43	31	45*	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	19	28	25	16	25	22	14	22	20	12

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	29	31
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	28	30	30	25	26	30	22	23	26	29	21
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	58	47	58	49	41	58	43	35	58	38	31	51	34	28
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	51	58	58	46	58	51	42	58	43	36	58	37	31	49	32	27	43	28	23	38	25	20	34	22	18
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	49	62*	52	41	62*	46	35	62*	41	30
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	60*	62*	62*	52	62*	52	41	62*	45	34	62*	39	28	59*	34	24	51	30	20	45	27	18
		27-45	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	52*	61*	59*	44	59*	51	38
			Exposed	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	52*	61*	58*	43	55*	49	36	47	43	31	42	37	26	37	33	23
	C	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	25	30	30	21	30	26	28	30	23	25	28	31	22
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	27	28	30	23	24	27	30	21	24	24	26	18	32	23	16	28	20	14
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	50	58	56	46	58	47	38	58	40	33	53	35	29	46	30	25	41	27	22	36	24	19
			Exposed	58	58	55	58	58	49	58	53	44	58	48	39	58	43	36	58	39	33	55	36	30	47	30	25	40	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	58*	62*	58*	45	62*	48	37	62*	42	31	61*	36	26	55*	32	22	49	28	19
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	54*	62*	60*	47	62*	52	41	62*	48	37	62*	43	33	62*	37	26	54*	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	57*	61*	61*	47	61*	52*	39	51	46	33	45	40	29	40	36	25
			Exposed	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	59*	61*	61*	52*	61*	61*	46	61*	55*	41	52*	46	34	44	40	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	24	33	29	31	33	25	27	30	22	24	27	29	21	24	26	19
			Exposed	33	33	33	33	33	31	33	33	27	33	33	25	33	32	22	33	29	31	33	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	33	28	36	31	25	36	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	36	36	30	36	33	27	36	29	24	36	26	22	36	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	59	64*	64*	51	64*	57	45	64*	47	36	64*	40	30	61*	35	25	52	31	21	46	27	18	41	24	16
			Exposed	64*	64*	58	64*	63*	49	64*	53	43	64*	48	37	64*	44	33	64*	40	29	64*	36	26	53	31	21	45	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	57*	64*	62*	46	59*	51	38	49	44	32	43	38	27	38	34	23	33	30	20
			Exposed	64*	64*	64*	64*	64*	62*	64*	64*	53	64*	64*	47	64*	55	42	58*	50	37	51	46	34	43	39	27	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12
70	B	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	31
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	30	26	25	26	26	22	23	26	29	21
		7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	49	41	51	43	35	51	38	31	51	34	28
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	42	51	43	36	51	37	31	49	32	27	43	28	23	38	25	20	34	22	18
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	49*	56*	52*	41	56*	46	35	56*	41	30
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	52*	56*	52*	41	56*	45	34	56*	39	28	56*	34	24	51*	30	20	45	27	18
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	51*	57*	57*	44	57*	51*	38
			Exposed	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	52*	57*	57*	43	55*	49*	36	48*	43	31	42	37	26	37	33	23
	C	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	21	26	26	28	26	23	25	26	31	22
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	28	23	24	26	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	51	51	46	51	47	38	51	40	33	51	35	29	46	30	25	41	27	22	36	24	19
			Exposed	51	51	51	51	51	49	51	51	44	51	48	39	51	43	36	51	39	33	51	36	30	47	30	25	40	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	45	56*	48*	37	56*	42	31	56*	36	26	55*	32	22	49*	28	19
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	54*	56*	56*	47*	56*	52*	41	56*	48*	37	56*	43	33	56*	37	26	54*	32	22	47*	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	47*	57*	52*	39	51*	46*	33	45*	40	29	40	36	25
			Exposed	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	52*	57*	57*	46*	57*	55*	41	51*	46*	34	44	40	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	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	31	28	25	27	28	22	24	27	29	21	24	26	19
			Exposed	28	28	28	28	28	28	28	28	27	28	28	25	28	28	22	28	28	31	28	26	28	28	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	51	56	56	46	56	51	42	56	46	38	56	39	32	51	33	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	56	56	46	56	49	41	56	44	37	56	40	33	56	36	30	51	33	27	46	30	25	39	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	59*	61*	61*	51	61*	57*	45	61*	47	36	61*	40	30	60*	35	25	52*	31	21	46	27	18	41	24	16
			Exposed	61*	61*	58*	61*	61*	49	61*	53*	43	61*	48	37	61*	44	33	61*	40	29	61*	36	26	53*	31	21	45	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	56*	60*	60*	46	59*	51*	38	49*	44	32	43	38	27	38	34	23	33	30	20
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	53*	60*	60*	47	60*	55*	42	57*	50*	37	51*	46	34	43	39	27	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12
80	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	30	22	22	26	22	22	23	22	29	21
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	38	31	40	34	28
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	37	31	40	32	27	40	28	23	38	25	20	34	22	18
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	49*	55*	52*	41	55*	46*	35	55*	41	30
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	52*	55*	52*	41	55*	45*	34	55*	39	28	55*	34	24	51*	30	20	45*	27	18
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	51*	54*	54*	44*	54*	51*	38
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	52*	54*	54*	43*	54*	49*	36	47*	43*	31	42*	37	26	37	33	23
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	28	22	22	25	22	31	22
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	28	22	22	24	22	30	21	22	26	18	32	23	16	28	20	14
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	33	40	35	29	40	30	25	40	27	22	36	24	19
			Exposed	40	40	40	40	40	40	40	40	40	40	40	39	40	40	36	40	39	33	40	36	30	40	30	25	40	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	45*	55*	48*	37	55*	42*	31	55*	36	26	55*	32	22	49*	28	19
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	54*	55*	55*	47*	55*	52*	41	55*	48*	37	55*	43*	33	55*	37	26	54*	32	22	47*	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	47*	54*	52*	40*	51*	46*	33	45*	40*	29	40*	36	25
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	52*	54*	54*	46*	54*	54*	41*	51*	46*	34	44*	40*	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	31	25	25	27	25	22	24	25	29	21	24	26	19
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	22	25	25	31	25	25	28	25	22	24	25	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	42	49	46	38	49	39	32	49	33	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	49	49	46	49	49	41	49	44	37	49	40	33	49	36	30	49	33	27	46	30	25	39	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	51*	55*	55*	45	55*	47*	36	55*	40	30	55*	35	25	52*	31	21	46*	27	18	41	24	16
			Exposed	55*	55*	55*	55*	55*	49*	55*	53*	43	55*	48*	37	55*	44	33	55*	40	29	55*	36	26	53*	31	21	45	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	46*	57*	51*	38	49*	44*	32	43	38	27	38	34	23	34	30	20
			Exposed	57*	57*	57*	57*	57*	57*	57*	57*	53*	57*	57*	47*	57*	56*	42	57*	50*	37	51*	46*	34	43	39	28	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30	20	20	26	20	20	23	20	29	21
		7-20	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	35	36	36	31	36	34	28
			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	31	36	32	27	36	28	23	36	25	20	34	22	18
		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*	41*	44*	44*	35	44*	41*	30
			Exposed	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	41*	44*	44*	34	44*	39*	28	44*	34	24	44*	30	20	44*	27	18
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	44*	50*	50*	38*
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	43*	51*	49*	36*	47*	43*	31	42*	38*	26	37*	33	23
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	28	20	20	25	20	30	22
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	28	20	20	24	20	30	21	20	26	18	30	23	16	28	20	14
		7-20	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	33	36	35	29	36	30	25	36	27	22	36	24	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	30	25	36	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		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*	37	44*	42*	31	44*	36	26	44*	32	22	44*	28	19
			Exposed	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	41*	44*	44*	37	44*	43*	33	44*	37	26	44*	32	22	44*	27	19	41*	24	16	36	21	14	32	19	13
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	39*	49*	46*	33	45*	40*	29	40*	36*	25
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	46*	51*	51*	41*	51*	46*	34	44*	40*	28	38*	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31	22	22	27	22	22	24	22	29	21	22	26	19
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31	22	22	28	22	22	24	22	29	20	22	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	39	32	40	33	28	40	29	24	39	25	21	34	22	18	30	20	16
			Exposed	40	40	40	40	40	40	40	40	37	40	40	33	40	36	30	40	33	27	40	30	25	39	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	51*	55*	55*	45*	55*	47*	36	55*	40	30	55*	35	25	52*	31	21	46*	27	18	41*	24	16
			Exposed	55*	55*	55*	55*	55*	49*	55*	53*	43*	55*	48*	37	55*	44*	33	55*	40	29	55*	36	26	53*	31	21	45*	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	46*	54*	51*	38	49*	44*	32	43*	38	27	38	34	23	33	30	20
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	53*	54*	54*	47*	54*	54*	42*	54*	50*	37	51*	46*	34	43*	39*	27	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12
100	B	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27	18	18	26	18	18	23	18	27	21
		7-20	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	35	36	36	31	36	34	28
			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	31	36	32	27	36	28	23	36	25	20	34	22	18
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	35*	40*	40*	30
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	34*	40*	39*	28	40*	34*	24	40*	30	20	40*	27	18
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	44*	47*	47*	38*
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	43*	49*	49*	36*	47*	43*	31	42*	37*	26	37*	33*	23
	C	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27	18	18	25	18	27	22
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27	18	18	24	18	27	21	18	26	18	27	23	16	27	20	14
		7-20	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	33	36	35	29	36	30	25	36	27	22	36	24	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	30	25	36	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	31	40*	36*	26	40*	32	22	40*	28	19
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	33	40*	37*	26	40*	32	22	40*	27	19	40*	24	16	36*	21	14	32	19	13
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	47*	47*	39*	46*	46*	34*	44*	40*	29	40*	36*	25
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	46*	49*	49*	41*	49*	46*	34*	44*	40*	28	38*	34*	24	33*	30	20	29	26	17	26	23	15
	D	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30	20	20	27	20	20	24	20	29	21	20	26	19
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30	20	20	28	20	20	24	20	29	20	20	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	33	28	36	29	24	36	25	21	34	22	18	30	20	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	33	27	36	30	25	36	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		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*	36	44*	40*	30	44*	35	25	44*	31	21	44*	27	18	41*	24	16
			Exposed	44*	44*	44*	44*	44*	44*	44*	44*	43*	44*	44*	37	44*	44*	33	44*	40*	29	44*	36	26	44*	31	21	44*	26	18	39*	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	46*	50*	50*	38*	48*	44*	32	43*	38*	27	38*	34	23	33	30	20
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	42*	51*	50*	37*	51*	46*	34	43*	39*	27	37*	33	23	32	29	19	28	25	17	25	22	14	22	20	12

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	98	98	98	94	98	98	89	98	98	86	98	95	82	98	88	76	95	82	69	89	77	60	84	72	52	79	66	46	75	58	41
			Exposed	98	98	89	98	98	85	98	93	81	98	89	77	98	85	73	94	82	68	90	79	63	84	73	53	79	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	98	98	98	98	98	98	98	98	95	98	98	90	98	94	86	98	90	82	98	86	79	91	79	71	85	73	61	81	64	53	76	56	46	72	49	41	67	44	55
			Exposed	98	94	86	98	89	81	98	84	77	92	80	73	88	77	67	85	73	61	82	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	36
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	98	98	92	98	94	88	98	87	81	97	80	75	91	75	65	86	68	53	82	60	45	78	53	39
			Exposed	98	98	97	98	97	91	98	92	86	98	87	82	98	83	78	96	80	74	92	77	68	86	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	99	99	92	99	95	86	96	88	80	89	83	75	83	78	67	78	73	57	73	67	50
			Exposed	99	99	99	99	99	95	99	99	91	99	96	86	99	92	83	95	88	79	91	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	98	98	92	98	98	87	98	96	83	98	92	80	98	88	76	97	84	72	93	81	67	87	76	57	81	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	98	88	76	96	83	71	92	80	65	88	76	58	84	72	53	81	68	48	78	62	44	71	53	56	62	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	98	98	89	98	92	84	98	87	80	96	83	76	91	79	71	87	76	65	84	71	59	79	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	90	79	71	86	75	63	83	69	57	80	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	98	98	98	98	98	94	98	95	89	98	91	85	98	86	81	98	83	77	95	79	73	89	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	98	86	80	98	82	76	93	78	70	89	74	61	86	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	29	42	37	25
		27-45	Interior	99	99	99	99	99	99	99	99	94	99	99	89	99	95	85	99	91	82	95	87	79	87	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	99	95	85	98	90	81	92	85	77	88	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	30
	D	0-7	Interior	98	98	85	98	93	81	98	89	77	98	85	73	94	81	68	90	78	62	86	75	56	80	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	37
			Exposed	93	81	68	89	77	60	85	74	54	81	68	49	78	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	98	89	82	98	84	77	91	80	72	88	76	66	84	72	60	81	66	54	79	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	36	60	39	32
			Exposed	84	72	60	81	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	98	97	91	98	92	86	98	87	81	98	83	77	96	79	73	92	76	67	88	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	95	79	73	91	75	66	87	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	27	59	35	24	53	31	21
		27-45	Interior	99	99	96	99	99	91	99	96	86	99	91	82	95	87	79	90	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	95	87	79	89	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	28	43	39	25
10	B	0-7	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	82	87	87	76	87	82	69	87	77	60	84	72	52	79	66	46	75	58	41
			Exposed	87	87	87	87	87	85	87	87	81	87	87	77	87	85	73	87	82	68	87	79	63	84	73	53	79	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	82	87	86	79	87	79	71	85	73	61	81	64	53	76	56	46	72	49	41	67	44	55
			Exposed	87	87	86	87	87	81	87	84	77	87	80	73	87	77	67	85	73	61	82	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	36
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	92	95	94	88	95	87	81	95	80	75	91	75	65	86	68	53	82	60	45	78	53	39
			Exposed	95	95	95	95	95	91	95	92	86	95	87	82	95	83	78	95	80	74	92	77	68	86	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	98	98	92	98	95	86	96	88	80	89	83	75	83	78	67	78	73	57	73	67	50
			Exposed	98	98	98	98	98	95	98	98	91	98	96	86	98	92	83	95	88	79	91	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	87	87	87	87	87	87	87	87	83	87	87	80	87	87	76	87	84	72	87	81	67	87	76	57	81	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	87	87	76	87	83	71	87	80	65	87	76	58	84	72	53	81	68	48	78	62	44	71	53	56	62	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	87	87	87	87	87	84	87	87	80	87	83	76	87	79	71	87	76	65	84	71	59	79	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	87	79	71	86	75	63	83	69	57	80	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	95	95	95	95	95	94	95	95	89	95	91	85	95	86	81	95	83	77	95	79	73	89	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	95	86	80	95	82	76	93	78	70	89	74	61	86	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	29	42	37	25
		27-45	Interior	98	98	98	98	98	98	98	98	94	98	98	89	98	95	85	98	91	82	95	87	79	87	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	98	95	85	98	90	81	92	85	77	88	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	30
	D	0-7	Interior	87	87	85	87	87	81	87	87	77	87	85	73	87	81	68	87	78	62	86	75	56	80	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	37
			Exposed	87	81	68	87	77	60	85	74	54	81	68	49	78	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	87	87	82	87	84	77	87	80	72	87	76	66	84	72	60	81	66	54	79	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	36	60	39	32
			Exposed	84	72	60	81	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	96	96	91	96	92	86	96	87	81	96	83	77	96	79	73	92	76	67	88	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	95	79	73	91	75	66	87	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	27	59	35	24	53	31	21
		27-45	Interior	98	98	96	98	98	91	98	96	86	98	91	82	95	87	79	90	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	95	87	79	89	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	28	43	39	25
20	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	69	77	77	60	77	72	52	77	66	46	75	58	41
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	63	77	73	53	77	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	71	78	73	61	78	64	53	76	56	46	72	49	41	67	44	55
			Exposed	78	78	78	78	78	78	78	78	77	78	78	73	78	77	67	78	73	61	78	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	36
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	81	88	80	75	88	75	65	86	68	53	82	60	45	78	53	39
			Exposed	88	88	88	88	88	88	88	88	86	88	87	82	88	83	78	88	80	74	88	77	68	86	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	86	91	88	80	89	83	75	83	78	67	78	73	57	73	67	50
			Exposed	91	91	91	91	91	91	91	91	91	91	91	86	91	91	83	91	88	79	91	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	72	77	77	67	77	76	57	77	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	77	77	76	77	77	71	77	77	65	77	76	58	77	72	53	77	68	48	77	62	44	71	53	56	62	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	76	78	78	71	78	76	65	78	71	59	78	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	78	78	71	78	75	63	78	69	57	78	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	85	88	86	81	88	83	77	88	79	73	88	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	88	86	80	88	82	76	88	78	70	88	74	61	86	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	29	42	37	25
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	89	91	91	85	91	91	82	91	87	79	87	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	91	91	85	91	90	81	91	85	77	88	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	30
	D	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	62	77	75	56	77	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	37
			Exposed	77	77	68	77	77	60	77	74	54	77	68	49	77	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	78	78	78	78	78	77	78	78	72	78	76	66	78	72	60	78	66	54	78	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	36	60	39	32
			Exposed	78	72	60	78	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	89	89	89	89	89	86	89	87	81	89	83	77	89	79	73	89	76	67	88	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	89	79	73	89	75	66	87	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	27	59	35	24	53	31	21
		27-45	Interior	93	93	93	93	93	91	93	93	86	93	91	82	93	87	79	90	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	93	87	79	89	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	28	43	39	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	69	77	77	60	77	72	52	77	66	46	75	58	41
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	63	77	73	53	77	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	71	78	73	61	78	64	53	76	56	46	72	49	41	67	44	55
			Exposed	78	78	78	78	78	78	78	78	77	78	78	73	78	77	67	78	73	61	78	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	~~36~~
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	80	75	83	75	65	83	68	53	82	60	45	78	53	39
			Exposed	83	83	83	83	83	83	83	83	83	83	83	82	83	83	78	83	80	74	83	77	68	83	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	83	75	83	78	67	78	73	57	73	67	50
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	86	79	86	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	72	77	77	67	77	76	57	77	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	77	77	76	77	77	71	77	77	65	77	76	58	77	72	53	77	68	48	77	62	44	71	53	56	62	45	48	54	39	42	47	51	~~37~~	41	45	~~32~~	55	40	~~29~~
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	76	78	78	71	78	76	65	78	71	59	78	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	78	78	71	78	75	63	78	69	57	78	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	~~32~~	52	~~34~~	~~29~~	47	~~31~~	~~25~~
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	83	77	83	79	73	83	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	83	83	80	83	82	76	83	78	70	83	74	61	83	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	~~29~~	42	~~37~~	~~25~~
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	86	86	82	86	86	79	86	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	86	86	85	86	86	81	86	85	77	86	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	~~30~~
	D	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	68	77	77	62	77	75	56	77	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	~~37~~
			Exposed	77	77	68	77	77	60	77	74	54	77	68	49	77	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	~~35~~	39	43	~~31~~	52	~~38~~	~~27~~	46	~~34~~	~~24~~
		7-20	Interior	78	78	78	78	78	77	78	78	72	78	76	66	78	72	60	78	66	54	78	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	~~36~~	60	39	~~32~~
			Exposed	78	72	60	78	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	~~36~~	57	37	~~31~~	50	~~33~~	~~27~~	44	~~29~~	~~24~~	~~39~~	~~26~~	~~21~~
		20-27	Interior	84	84	84	84	84	84	84	84	81	84	83	77	84	79	73	84	76	67	84	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	84	79	73	84	75	66	84	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	~~27~~	59	~~35~~	~~24~~	53	~~31~~	~~21~~
		27-45	Interior	88	88	88	88	88	88	88	88	86	88	88	82	88	87	79	88	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	88	87	79	88	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	~~28~~	43	39	~~25~~
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	60	71	71	52	71	66	46	71	58	41
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	63	71	71	53	71	64	45	71	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	61	73	64	53	73	56	46	72	49	41	67	44	55
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	67	73	73	61	73	67	55	73	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	~~36~~
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	75	65	78	68	53	78	60	45	78	53	39
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	68	54	78	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	75	81	78	67	78	73	57	73	67	50
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	76	82	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	57	71	68	49	71	60	42	70	52	56	63	46	49	56	41	44
			Exposed	71	71	71	71	71	71	71	71	65	71	71	58	71	71	53	71	68	48	71	62	44	71	53	56	62	45	48	54	39	42	47	51	~~37~~	41	45	~~32~~	55	40	~~29~~
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	65	73	71	59	73	61	50	73	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	73	73	71	73	73	63	73	69	57	73	62	51	73	56	47	73	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	~~32~~	52	~~34~~	~~29~~	47	~~31~~	~~25~~
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	73	78	72	59	78	63	49	78	54	40	75	48	34	69	42	45	63	37	38
			Exposed	78	78	78	78	78	76	78	78	70	78	74	61	78	68	54	78	62	48	78	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	~~29~~	42	~~37~~	~~25~~
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	82	82	82	82	82	81	82	82	77	82	82	73	82	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	~~30~~
	D	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	68	73	73	62	73	73	56	73	67	48	73	58	41	68	50	53	60	44	47	53	58	41	47	52	~~37~~
			Exposed	73	73	68	73	73	60	73	73	54	73	68	49	73	63	44	73	57	40	70	52	56	61	44	47	52	57	40	45	49	~~35~~	39	43	~~31~~	52	~~38~~	~~27~~	46	~~34~~	~~24~~
		7-20	Interior	75	75	75	75	75	75	75	75	72	75	75	66	75	72	60	75	66	54	75	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	~~36~~	60	39	~~32~~
			Exposed	75	72	60	75	64	53	75	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	~~36~~	57	37	~~31~~	50	~~33~~	~~27~~	44	~~29~~	~~24~~	~~39~~	~~26~~	~~21~~
		20-27	Interior	80	80	80	80	80	80	80	80	80	80	80	77	80	79	73	80	76	67	80	72	59	80	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	80	79	73	80	75	66	80	69	56	80	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	~~27~~	59	~~35~~	~~24~~	53	~~31~~	~~21~~
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	82	84	84	79	84	84	76	83	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	84	84	79	84	83	75	84	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	~~28~~	43	39	~~25~~
50	B	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	64	52	64	64	46	64	58	41
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	53	64	64	45	64	56	39	64	49	52	59	43	46	52	57	41
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	64	53	67	56	46	67	49	41	67	44	55
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	55	67	57	47	67	49	40	64	42	52	56	55	46	49	49	40	44	43	~~36~~
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	85	79	88	80	75	88	76	68
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	86	80	88	80	74	88	75	64	85	67	50	81	59	40	77	52	36
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	84	88	88	80	87	84	76
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	85	90	87	79	88	82	74	83	77	67	78	72	56	73	66	47
	C	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	57	64	64	49	64	60	42	64	52	56	63	46	49	56	41	44
			Exposed	64	64	64	64	64	64	64	64	64	64	64	58	64	64	53	64	64	48	64	62	44	64	53	56	62	45	48	54	39	42	47	51	~~37~~	41	45	~~32~~	55	40	~~29~~
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	59	67	61	50	67	52	43	67	45	37	60	39	49	53	52	43	47	47	39
			Exposed	67	67	67	67	67	63	67	67	57	67	62	51	67	56	47	67	51	42	67	47	39	61	40	50	52	51	43	45	45	37	59	39	~~32~~	52	~~34~~	~~29~~	47	~~31~~	~~25~~
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	83	88	82	77	88	77	69	87	71	56	83	63	45	80	56	39
			Exposed	88	88	88	88	88	88	88	88	88	88	88	84	88	85	80	88	82	76	88	79	72	88	72	57	83	62	44	78	54	37	74	47	32	69	42	~~29~~	63	~~37~~	~~25~~
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	88	89	89	82	87	85	77	85	80	71	80	76	62	76	70	52
			Exposed	90	90	90	90	90	90	90	90	90	90	90	88	90	90	85	90	90	81	90	86	78	86	80	71	80	75	60	74	67	49	66	59	40	58	52	35	52	46	~~30~~
	D	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	56	67	67	48	67	58	41	67	50	53	60	44	47	53	58	41	47	52	~~37~~
			Exposed	67	67	67	67	67	60	67	67	54	67	67	49	67	63	44	67	57	40	67	52	56	61	44	47	52	57	40	45	49	~~35~~	39	43	~~31~~	52	~~38~~	~~27~~	46	~~34~~	~~24~~
		7-20	Interior	70	70	70	70	70	70	70	70	70	70	70	66	70	70	60	70	66	54	70	60	50	70	51	42	67	44	54	58	38	47	50	50	41	44	44	~~36~~	60	39	~~32~~
			Exposed	70	70	60	70	64	53	70	58	48	70	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	~~36~~	57	37	~~31~~	50	~~33~~	~~27~~	44	~~29~~	~~24~~	~~39~~	~~26~~	~~21~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	76	67	77	72	59	77	62	47	77	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	77	77	73	77	75	66	77	69	56	77	63	49	77	57	43	77	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	~~27~~	59	~~35~~	~~24~~	53	~~31~~	~~21~~
		27-45	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	91	94	94	87	93	90	81	90	84	76	84	79	69	79	74	58	74	67	48	67	59	40
			Exposed	94	94	94	94	94	90	94	94	86	94	91	82	94	87	78	90	83	75	86	80	71	79	74	59	73	66	46	63	57	38	55	50	33	49	44	~~28~~	43	39	~~25~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	46	58	58	41
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	45	58	56	39	58	49	52	58	43	46	52	57	41
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	80	78	70	80	73	62	80	67	55
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78	80	79	70	80	72	61	80	63	52	76	55	46	71	49	40	66	43	36
		20-27	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	80	75	82	76	68
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	80	82	80	74	82	75	64	82	67	50	81	59	40	77	52	36
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	85	85	80	84	84	76
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	86	79	86	82	74	83	77	67	78	72	56	73	66	47
	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	57	58	58	49	58	58	42	58	52	56	58	46	49	56	41	44
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	48	58	58	44	58	53	56	58	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	75	80	76	65	80	68	56	78	59	49	74	52	43	69	47	39
			Exposed	80	80	80	80	80	80	80	80	79	80	80	75	80	79	70	80	75	64	80	70	59	78	60	50	73	51	43	67	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	77	69	82	71	56	82	63	45	80	56	39
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	76	82	79	72	82	72	57	82	62	44	78	54	37	74	47	32	69	42	29	63	37	25
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	82	84	84	77	83	80	71	80	76	62	76	70	52
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	85	86	86	81	86	86	78	86	80	71	80	75	60	74	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	48	62	58	41	62	50	53	60	44	47	53	58	41	47	52	37
			Exposed	62	62	62	62	62	60	62	62	54	62	62	49	62	62	44	62	57	40	62	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	64	54	64	60	50	64	51	42	64	44	54	58	38	47	50	50	41	44	44	36	60	39	32
			Exposed	64	64	60	64	64	53	64	58	48	64	52	43	64	47	39	64	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	84	81	76	84	76	67	84	69	52	82	60	41	78	53	36	74	47	32
			Exposed	84	84	84	84	84	84	84	84	81	84	82	77	84	79	72	84	76	67	84	71	57	82	61	42	77	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	87	87	81	86	83	76	84	78	68	79	73	57	74	67	48	66	59	40
			Exposed	89	89	89	89	89	89	89	89	86	89	89	82	89	86	78	89	83	75	86	80	71	79	74	58	72	65	46	63	57	38	55	50	33	49	44	28	43	39	25
70	B	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	50	41
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	39	50	49	52	50	43	46	50	57	41
		7-20	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	76	76	76	76	76	76	70	76	73	62	76	67	55
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	70	76	72	61	76	63	52	76	55	46	71	49	40	66	43	36
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	76	68
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	74	79	75	64	79	67	50	79	59	40	77	52	36
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	80	74	80	77	67	78	72	56	73	66	47
	C	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	42	50	50	56	50	46	49	50	41	44
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	44	50	50	56	50	45	48	50	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	76	76	65	76	68	56	76	59	49	74	52	43	69	47	39
			Exposed	76	76	76	76	76	76	76	76	76	76	76	75	76	76	70	76	75	64	76	70	59	76	60	50	73	51	43	67	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	77	69	79	71	56	79	63	45	78	56	39
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	79	72	79	72	57	79	62	44	78	54	37	74	47	32	69	42	29	63	37	25
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	80	71	79	76	62	76	70	52
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78	80	80	71	80	75	60	74	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	41	55	50	53	55	44	47	53	58	41	47	52	37
			Exposed	55	55	55	55	55	55	55	55	54	55	55	49	55	55	44	55	55	40	55	52	56	55	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	74	78	75	64	78	66	54	77	57	47	72	50	41	67	44	36	60	39	32
			Exposed	78	78	78	78	78	77	78	78	71	78	76	65	78	71	59	78	65	54	78	60	49	72	50	42	66	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76	81	76	67	81	69	52	80	60	41	78	53	36	74	47	32
			Exposed	81	81	81	81	81	81	81	81	81	81	77	81	79	72	81	76	67	81	71	57	81	61	42	77	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	83	83	76	81	78	68	79	73	57	74	67	48	66	59	40
			Exposed	84	84	84	84	84	84	84	84	84	84	84	82	84	84	78	84	83	75	84	80	71	79	74	58	72	65	46	63	57	38	55	50	33	49	44	28	43	39	25
80	B	0-7	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	41
			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	39	44	44	52	44	43	46	44	57	41
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	62	68	67	55
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	63	52	68	55	46	68	49	40	66	43	36
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	76	68
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	75	64	77	67	50	77	59	40	77	52	36	77	52	36
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	67	75	72	56	73	66	47
	C	0-7	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	42	44	44	56	44	44	49	44	41	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	56	44	44	48	44	39	42	44	51	37	41	45	32	55	40	29
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	68	56	68	59	49	68	52	43	68	47	39
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	68	59	68	60	50	68	51	43	67	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	71	56	77	63	45	77	56	39
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	72	77	72	57	77	62	44	77	54	37	74	47	32	69	42	29	63	37	25
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	62	75	70	52
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	75	60	74	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	48	49	49	41	49	49	53	49	44	47	49	58	41	47	52	37
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	40	49	49	56	49	44	47	49	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	64	75	66	54	75	57	47	72	50	41	67	44	36	60	39	32
			Exposed	75	75	75	75	75	75	75	75	71	75	75	65	75	71	59	75	65	54	75	60	49	72	50	42	66	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	76	67	78	69	52	78	60	41	77	53	36	74	47	32
			Exposed	78	78	78	78	78	78	78	78	78	78	78	77	78	78	72	78	76	67	78	71	57	78	61	42	77	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	79	69	78	74	58	74	67	48	67	59	40
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	79	71	79	74	59	73	66	47	63	57	38	55	50	33	49	44	28	43	39	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	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
			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	52	39	39	46	39	57	41
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	55
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	63	52	65	55	46	65	49	40	65	43	36
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	68
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	64	73*	67	50	73*	59	40	73*	52	36
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	67	71*	71*	56	71*	66	47
	C	0-7	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	56	39	39	49	39	39	44
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	56	39	39	48	39	39	42	39	51	37	39	45	32	55	40	29
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	56	65	59	49	65	52	43	65	47	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	59	65	60	50	65	51	43	65	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	69	73*	71	56	73*	63	45	73*	56	39
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72*	73*	72*	57	73*	62	44	73*	54	37	73*	47	32	69	42	29	63	37	25
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	62	71*	70*	52
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	60	71*	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	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	41	44	44	53	44	44	47	44	58	41	44	52	37
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	56	44	44	47	44	57	40	44	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	66	54	68	57	47	68	50	41	67	44	36	60	39	32
			Exposed	68	68	68	68	68	68	68	68	68	68	68	65	68	68	59	68	65	54	68	60	49	68	50	42	66	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	67	75	69	52	75	60	41	75	53	36	74	47	32
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	67	75	71	57	75	61	42	75	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	73	57	74	67	48	66	59	40
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	74	58	72	65	46	63	57	38	55	50	33	49	44	28	43	39	25
100	B	0-7	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
			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	52	36	36	46	36	54	41
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	55
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	63	52	65	55	46	65	49	40	65	43	36
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	64	70*	67*	50	70*	59	40	70*	52	36
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	56	68*	66*	47
	C	0-7	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	54	36	36	49	36	36	44
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	54	36	36	48	36	36	42	36	51	37	36	45	32	54	40	29
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	56	65	59	49	65	52	43	65	47	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	59	65	60	50	65	51	43	65	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	56	70*	63	45	70*	56	39
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	57	70*	62	44	70*	54	37	70*	47	32	69*	42	29	63	37	25
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	62	68*	68*	52
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	60	68*	68*	49	66*	59	40	58	52	35	52	46	30
	D	0-7	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	53	39	39	47	39	58	41	39	52	37
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	56	39	39	47	39	57	40	39	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	54	65	57	47	65	50	41	65	44	36	60	39	32
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	54	65	60	49	65	50	42	65	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	69	52	73*	60	41	73*	53	36	73*	47	32
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72*	73*	73*	67	73*	71	57	73*	61	42	73*	52	36	72*	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	69*	71*	71*	57	71*	67	48	66	59	40
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	58	71*	65	46	63	57	38	55	50	33	49	44	28	43	39	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	83	83	83	83	83	83	83	83	81	83	83	78	83	83	75	83	82	71	83	79	67	83	74	53	79	67	42	75	56	37	69	46	32	61	40	28	51	35	25
			Exposed	83	83	75	83	81	70	83	78	64	83	75	55	82	71	48	79	67	42	76	59	38	69	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	83	83	83	83	83	83	83	83	79	83	82	76	83	78	71	83	75	67	82	72	59	77	61	44	71	47	37	64	39	32	55	34	28	47	30	25	41	27	22
			Exposed	83	78	71	83	75	66	80	70	55	77	63	46	74	54	40	70	46	37	67	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	83	84	84	80	84	81	77	84	78	73	84	72	64	81	64	49	76	50	39	72	41	32	67	36	27	58	32	24
			Exposed	84	84	80	84	80	76	84	77	71	84	73	66	83	69	56	80	62	47	78	54	41	72	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	84	84	80	84	84	77	84	79	71	79	74	62	75	68	49	68	57	41	58	47	35	47	40	30
			Exposed	84	84	83	84	84	79	84	83	76	84	80	72	82	77	68	79	74	61	76	70	53	69	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	83	83	77	83	83	73	83	80	68	83	77	61	83	74	53	81	70	46	78	66	41	72	52	35	65	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	83	74	52	80	69	44	77	62	39	73	53	35	69	47	32	64	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	83	81	75	83	77	69	82	73	62	79	68	52	76	61	44	73	52	39	70	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	76	60	44	72	50	39	68	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	84	84	82	84	83	78	84	79	75	84	76	70	84	72	64	82	68	54	80	60	46	75	46	36	69	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	84	72	63	82	67	51	78	56	43	76	48	37	72	41	33	68	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	84	84	84	84	84	82	84	84	78	84	82	75	84	79	71	81	76	67	78	73	59	72	65	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	84	79	71	80	75	65	77	71	55	73	66	47	69	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	83	82	70	83	78	65	83	75	55	81	70	47	78	66	41	76	58	38	72	51	34	63	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	78	66	41	75	56	37	70	48	33	66	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	83	75	66	80	70	55	77	63	46	74	53	40	70	45	36	66	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	70	45	36	65	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	84	81	76	84	77	71	84	73	66	83	68	55	80	61	46	77	52	40	75	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	80	61	46	76	50	39	73	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	84	84	80	84	83	76	84	80	72	82	77	67	79	73	59	76	69	51	72	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	78	73	59	75	68	49	70	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
10	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	67	74	74	53	74	67	42	74	56	37	69	46	32	61	40	28	51	35	25
			Exposed	74	74	74	74	74	70	74	74	64	74	74	55	74	71	48	74	67	42	74	59	38	69	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	67	74	72	59	74	61	44	71	47	37	64	39	32	55	34	28	47	30	25	41	27	22
			Exposed	74	74	71	74	74	66	74	70	55	74	63	46	74	54	40	70	46	37	67	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	77	81	78	73	81	72	64	81	64	49	76	50	39	72	41	32	67	36	27	58	32	24
			Exposed	81	81	80	81	80	76	81	77	71	81	73	66	81	69	56	80	62	47	78	54	41	72	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	83	77	83	79	71	79	74	62	75	68	49	68	57	41	58	47	35	47	40	30
			Exposed	83	83	83	83	83	79	83	83	76	83	80	72	82	77	68	79	74	61	76	70	53	69	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	74	74	74	74	74	73	74	74	68	74	74	61	74	74	53	74	70	46	74	66	41	72	52	35	65	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	74	74	52	74	69	44	74	62	39	73	53	35	69	47	32	64	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	74	74	74	74	74	69	74	73	62	74	68	52	74	61	44	73	52	39	70	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	74	60	44	72	50	39	68	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	81	81	81	81	81	78	81	79	75	81	76	70	81	72	64	81	68	54	80	60	46	75	46	36	69	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	81	72	63	81	67	51	78	56	43	76	48	37	72	41	33	68	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	83	83	83	83	83	82	83	83	78	83	82	75	83	79	71	81	76	67	78	73	59	72	65	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	83	79	71	80	75	65	77	71	55	73	66	47	69	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	74	74	70	74	74	65	74	74	55	74	70	47	74	66	41	74	58	38	72	51	34	63	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	74	66	41	74	56	37	70	48	33	66	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	74	74	66	74	70	55	74	63	46	74	53	40	70	45	36	66	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	70	45	36	65	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	82	81	76	82	77	71	82	73	66	82	68	55	80	61	46	77	52	40	75	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	80	61	46	76	50	39	73	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	84	84	80	84	83	76	84	80	72	82	77	67	79	73	59	76	69	51	72	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	78	73	59	75	68	49	70	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
20	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	53	62	62	42	62	56	37	62	46	32	61	40	28	51	35	25
			Exposed	62	62	62	62	62	62	62	62	62	62	62	55	62	62	48	62	62	42	62	59	38	62	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	61	44	62	47	37	62	39	32	55	34	28	47	30	25	41	27	22
			Exposed	62	62	62	62	62	62	62	62	55	62	62	46	62	54	40	62	46	37	62	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	72	64	75	64	49	75	50	39	72	41	32	67	36	27	58	32	24
			Exposed	75	75	75	75	75	75	75	75	71	75	73	66	75	69	56	75	62	47	75	54	41	72	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	71	77	74	62	75	68	49	68	57	41	58	47	35	47	40	30
			Exposed	77	77	77	77	77	77	77	77	76	77	77	72	77	77	68	77	74	61	76	70	53	69	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	61	62	62	53	62	62	46	62	62	41	62	52	35	62	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	62	62	52	62	62	44	62	62	39	62	53	35	62	47	32	62	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	52	62	61	44	62	52	39	62	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	62	60	44	62	50	39	62	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	70	75	72	64	75	68	54	75	60	46	75	46	36	69	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	75	72	63	75	67	51	75	56	43	75	48	37	72	41	33	68	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	71	77	76	67	77	73	59	72	65	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	77	77	71	77	75	65	77	71	55	73	66	47	69	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	58	38	62	51	34	62	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	62	62	41	62	56	37	62	48	33	62	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	62	62	62	62	62	55	62	62	46	62	53	40	62	45	36	62	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	62	45	36	62	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	76	76	76	76	76	71	76	73	66	76	68	55	76	61	46	76	52	40	75	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	76	61	46	76	50	39	73	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	78	78	78	78	78	76	78	78	72	78	77	67	78	73	59	76	69	51	72	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	78	73	59	75	68	49	70	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	42	61	56	37	61	46	32	61	40	28	51	35	25
			Exposed	61	61	61	61	61	61	61	61	61	61	61	55	61	61	48	61	61	42	61	59	38	61	47	32	59	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	61	44	62	47	37	62	39	32	55	34	28	47	30	25	41	27	22
			Exposed	62	62	62	62	62	62	62	62	55	62	62	46	62	54	40	62	46	37	62	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	64	71*	64	49	71*	50	39	71*	41	32	67	36	27	58	32	24
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	66	71*	69*	56	71*	62	47	71*	54	41	71*	42	33	66	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	62	70*	68*	49	69*	57	41	58	47	35	47	40	30
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	61	70*	70*	53	69*	58	41	56	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	46	61	61	41	61	52	35	61	42	30	53	36	26	44	32	22	38	28	30	34	25	26
			Exposed	61	61	52	61	61	44	61	61	39	61	53	35	61	47	32	61	41	29	56	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	52	62	61	44	62	52	39	62	45	36	60	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	62	60	44	62	50	39	62	42	35	62	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	64	71*	68*	54	71*	60	46	71*	46	36	69*	38	29	60	33	24	51	29	21	44	25	27	39	23	23
			Exposed	71*	71*	63	71*	67	51	71*	56	43	71*	48	37	71*	41	33	68*	38	29	63	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	67*	70*	70*	59	70*	66*	45	64	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	70*	70*	70*	70*	70*	66*	70*	70*	55	70*	67*	47	69*	58	41	62	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	58	38	62	51	34	62	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	62	62	41	62	56	37	62	48	33	62	42	30	57	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	62	62	62	62	62	55	62	62	46	62	53	40	62	45	36	62	40	33	60	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	62	45	36	62	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	72*	72*	72*	72*	72*	70	72*	72*	66	72*	68	55	72*	61	46	72*	52	40	72*	45	36	68	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	72*	61	46	72*	50	39	72*	42	34	69	38	30	64	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	67	71*	71*	59	71*	69*	51	71*	64	45	61	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	71*	71*	59	71*	68	49	70*	60	42	64	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
40	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	42	52	52	42	52	52	37	52	46	32	52	40	28	51	35	25
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	42	52	52	38	52	47	32	52	39	28	48	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	47	37	55	39	32	55	34	28	47	30	25	41	27	22
			Exposed	55	55	55	55	55	55	55	55	55	55	55	46	55	54	40	55	46	37	55	41	34	55	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	49	63*	50	39	63*	41	32	63*	36	27	58*	32	24			
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56	63*	62*	47	63*	54	41	63*	42	33	63*	36	27	55	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	62*	64*	64*	49	64*	57*	41	58*	47	35	47	40	30			
			Exposed	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	61*	64*	64*	53	64*	58*	41	57*	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	46	52	52	41	52	52	35	52	42	30	52	36	26	44	32	22	38	28	30	34	25	26
			Exposed	52	52	52	52	52	44	52	52	39	52	52	35	52	47	32	52	41	29	52	38	27	45	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	52	55	55	44	55	52	39	55	45	36	55	37	30	50	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	55	55	44	55	50	39	55	42	35	55	38	31	55	34	28	49	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	54	63*	60*	46	63*	46	36	63*	38	29	60*	33	24	51	29	21	44	25	27	39	23	23
			Exposed	63*	63*	63*	63*	63*	51	63*	56	43	63*	48	37	63*	41	33	63*	38	29	63*	34	26	52	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	59*	64*	64*	45	64*	51	37	49	41	31	40	36	26	36	32	23	32	28	20
			Exposed	64*	64*	64*	64*	64*	64*	64*	64*	56*	64*	64*	47	64*	58*	41	62*	50	37	53	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	47	55	55	41	55	55	38	55	51	34	55	41	29	51	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	55	55	41	55	55	37	55	48	33	55	42	30	55	38	27	50	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	59	59	59	59	59	55	59	59	46	59	53	40	59	45	36	59	40	33	59	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	59	45	36	59	39	32	57	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	55	65*	61	46	65*	52	40	65*	45	36	65*	37	29	58	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	65*	61	46	65*	50	39	65*	42	34	65*	38	30	64*	35	26	57	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	60*	66*	66*	51	66*	64*	45	61*	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	66*	66*	60*	66*	66*	49	66*	60*	42	64*	51	37	54	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
50	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	32	42	40	28	42	35	25
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	32	42	39	28	42	34	24	41	29	31	36	26	28	32	23	25
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	37	46	39	32	46	34	28	46	30	25	41	27	22
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	37	46	41	34	46	34	28	46	29	24	39	25	32	34	22	28	30	30	25	27	26	22
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	49	58*	50*	39	58*	41	32	58*	36	27	58*	32	24			
			Exposed	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	56*	58*	58*	47	58*	54*	41	58*	42	33	58*	36	27	55*	31	22	47	27	19	40	24	25	36	32	22
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	50*	60*	57*	41	58*	47	35	47	40	30
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	53*	60*	58*	41	56*	46	34	44	39	29	38	34	24	33	30	21	29	26	28
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	35	42	42	30	42	36	26	42	32	22	38	28	30	34	25	26
			Exposed	42	42	42	42	42	42	42	42	39	42	42	35	42	42	32	42	41	29	42	38	27	42	32	23	38	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	39	46	45	36	46	37	30	46	32	26	42	27	23	37	24	30	32	32	26	29	28	23
			Exposed	46	46	44	46	46	39	46	42	35	46	38	31	46	34	28	46	31	26	44	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	54*	58*	58*	46	58*	46	36	58*	38	29	58*	33	24	51*	29	21	44	25	27	39	23	23
			Exposed	58*	58*	58*	58*	58*	51*	58*	56*	43	58*	48	37	58*	41	33	58*	38	29	58*	34	26	52*	29	21	43	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	59*	60*	60*	45	60*	51*	37	49*	41	31	40	36	26	36	32	23	32	28	20
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	55*	60*	60*	47	60*	58*	41	60*	50*	37	53*	44	33	41	37	27	35	31	22	30	27	28	26	24	24	23	32	21	31	28	18
	D	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	41	47	47	38	47	47	34	47	41	29	47	35	25	42	30	21	36	26	28	32	23	25	28	31	22
			Exposed	47	47	41	47	47	37	47	47	33	47	42	30	47	38	27	47	35	24	44	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	50	50	50	50	50	50	50	50	46	50	50	40	50	45	36	50	40	33	50	37	30	49	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	50	45	36	50	39	32	50	35	29	50	32	26	44	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	55*	61*	61*	46	61*	52	40	61*	45	36	61*	37	29	58*	32	23	48	28	20	41	24	25	36	32	22	32	29	20
			Exposed	61*	61*	46	61*	50	39	61*	42	34	61*	38	30	61*	35	26	57*	32	23	51	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	59*	62*	62*	52*	62*	62*	45	61*	49	36	47	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	62*	62*	59*	62*	62*	49	62*	60*	42	62*	52*	37	54*	44	33	46	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	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	32	35	35	28	35	35	25
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	28	35	34	24	35	29	31	35	26	28	32	23	25
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	32	38	34	28	38	30	25	38	27	22
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	34	38	34	28	38	29	24	38	25	32	34	22	28	30	30	25	27	26	22
		20-27	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*	49*	52*	50*	39	52*	41	32	52*	36	27	52*	32	24
			Exposed	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	47*	52*	52*	41	52*	42	33	52*	36	27	52*	31	22	47*	27	19	40	24	25	36	32	22
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	62*	67*	67*	53	67*	61*	46
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	51	66*	58	43	57	51	37	50	45	32	45	40	28	45	40	28
	C	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	30	35	35	26	35	32	22	35	28	30	34	25	26
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	29	35	35	27	35	32	23	35	27	29	32	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	37	30	38	32	26	38	27	23	37	24	30	32	32	26	29	28	23
			Exposed	38	38	38	38	38	38	38	38	35	38	38	31	38	34	28	38	31	26	38	29	24	37	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	46*	52*	46*	36	52*	38	29	52*	33	24	51*	29	21	44*	25	27	39	23	23
			Exposed	52*	52*	52*	52*	52*	51*	52*	52*	43*	52*	48*	37	52*	41	33	52*	38	29	52*	34	26	52*	29	21	43*	25	26	37	22	22	32	29	20	28	25	17	25	22	15
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	56	67*	63*	47	61*	55	40	54	48	34	48	43	30
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	62*	67*	67*	55	67*	66*	50	62*	55	41	53	47	34	46	41	28	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	34	39	39	29	39	35	25	39	30	21	36	26	28	32	23	25	28	31	22
			Exposed	39	39	39	39	39	37	39	39	33	39	39	30	39	38	27	39	35	24	39	32	22	37	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	40	42	42	36	42	40	33	42	37	30	42	31	26	41	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	42	42	36	42	39	32	42	35	29	42	32	26	42	29	24	40	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	46	55*	52*	40	55*	45	36	55*	37	29	55*	32	23	48*	28	20	41	24	25	36	32	22	32	29	20
			Exposed	55*	55*	46	55*	50*	39	55*	42	34	55*	38	30	55*	35	26	55*	32	23	51*	29	21	42	24	25	36	32	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	51*	58*	58*	45*	58*	49*	36	47*	40	30	39	35	25	34	30	21	30	27	28	27	24	24
			Exposed	58*	58*	58*	58*	58*	49*	58*	58*	42	58*	51*	37	54*	44	33	46*	40	30	40	36	27	34	31	22	29	26	27	25	23	23	22	30	20	30	27	17	26	24	15
70	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	28	31	31	25
			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	28	31	31	24	31	29	31	31	26	28	31	23	25
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	28	33	30	25	33	27	22
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	29	24	33	25	32	33	22	28	30	30	25	27	26	22
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	58*	63*	62*	49	63*	55	42	63*	49	36
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	62*	63*	63*	50	63*	54	41	63*	46	34	63*	41	28	61*	36	25	54	32	22
		27-45	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	61*	63*	63*	53*	63*	61*	45
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	51	63*	58*	43	57*	51	37	50	45	32	44	40	28
	C	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	30	31	31	26	31	31	22	31	28	30	31	25	26
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	27	31	31	23	31	27	29	31	24	25	28	31	22	25	28	20	22	24	17
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	32	26	33	27	23	33	24	30	32	32	26	29	28	23
			Exposed	33	33	33	33	33	33	33	33	33	33	33	31	33	33	28	33	31	26	33	29	24	33	24	30	32	31	26	27	27	22	24	24	20	32	21	17	28	19	15
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	54	63*	58*	44	63*	50	37	63*	44	31	62*	38	27	58*	34	23
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56*	63*	62*	49	63*	57*	44	63*	52	39	63*	44	32	63*	38	26	56*	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56*	63*	62*	47	61*	55*	40	54*	48	34	48	43	30
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	62*	63*	63*	63*	55*	63*	63*	49	62*	55*	41	53*	47	34	46	41	28	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	29	34	34	25	34	30	21	34	26	28	32	23	25	28	31	22
			Exposed	34	34	34	34	34	34	34	34	33	34	34	30	34	34	27	34	34	24	34	32	22	34	27	29	31	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	36	37	37	33	37	37	30	37	31	26	37	26	22	35	23	29	31	30	25	27	27	22	24	24	20
			Exposed	37	37	36	37	37	32	37	35	29	37	32	26	37	29	24	37	26	22	37	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	61	68*	67*	54	68*	56	43	68*	48	35	68*	42	30	62*	37	25	55	32	22	49	29	20
			Exposed	68*	68*	68*	68*	68*	59	68*	64*	51	68*	58	45	68*	52	39	68*	48	35	68*	44	31	63*	37	25	54	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	55	66*	61*	45	59*	52	38	51	46	33	45	40	28	40	36	24
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	64*	66*	66*	56	66*	66*	50	66*	60*	45	61*	55	40	52	46	33	44	40	27	38	34	23	34	30	20	30	27	17	26	24	15
80	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	31	27	26	28	27	23	25
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	51	42	53	45	37	53	40	33
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	51	53	52	43	53	44	37	53	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	50*	59*	59*	59*	59*	59*	58*	59*	59*	49	59*	55*	42	59*	49	36
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	50*	59*	54*	41	59*	46	34	59*	41	28	59*	36	25	54*	32	22
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	52*	59*	59*	45
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	51*	59*	58*	43	57*	51*	37	50*	45	32	44	40	28
	C	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	27	27	22	27	27	30	27	25	26
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	29	27	24	25	27	31	22	25	28	20	22	24	17
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	48	39	53	41	34	53	36	30	49	32	26	43	28	23
			Exposed	53	53	53	53	53	53	53	53	52	53	53	47	53	52	43	53	47	39	53	43	36	53	36	30	48	31	26	41	27	22	36	24	20	32	21	17	28	19	15
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	54*	59*	58*	44	59*	50*	37	59*	44	31	59*	38	27	58*	34	23
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	49	59*	57*	44	59*	52*	39	59*	44	32	59*	38	26	56*	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	47*	59*	55*	40	54*	48*	34	48*	43	30
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	55*	59*	59*	50*	59*	55*	41	53*	48*	34	46	41	28	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	25	30	30	21	30	26	28	30	23	25	28	31	22
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	27	29	30	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	31	26	32	26	22	32	23	29	31	30	25	27	27	22	24	24	20
			Exposed	32	32	32	32	32	32	32	32	29	32	32	26	32	29	24	32	26	22	32	24	30	31	31	25	26	26	22	23	23	19	30	29	16	27	18	14	24	16	13
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	54	62*	56*	43	62*	48	35	62*	42	30	61*	37	25	55*	32	22	49	29	20
			Exposed	62*	62*	62*	62*	62*	59*	62*	62*	51	62*	58*	45	62*	52	39	62*	48	35	62*	44	31	62*	37	25	54	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	61*	45	58*	53*	38	51	46	33	45	40	28	40	36	24
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56*	62*	62*	50	62*	60*	45	61*	55*	40	52*	46	33	44	40	27	38	34	23	34	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	31	24	24	28	24	23	25
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	45	37	48	40	33
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	44	37	48	38	32	48	34	28	45	30	25	40	26	22
		20-27	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	49*	53*	53*	42	53*	49*	36
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	50*	53*	53*	41	53*	46*	34	53*	41	28	53*	36	25	53*	32	22
		27-45	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	53*	56*	56*	46*
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	43*	56*	51*	37	50*	45*	32	45*	40	28						
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	30	24	24	26
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	29	24	24	25	24	31	22	24	28	20	22	24	17
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	39	48	41	34	48	36	30	48	32	26	43	28	23
			Exposed	48	48	48	48	48	48	48	48	48	48	48	47	48	48	43	48	47	39	48	43	36	48	36	30	48	31	26	41	27	22	36	24	20	32	21	17	28	19	15
		20-27	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	44	53*	50*	37	53*	44	31	53*	38	27	53*	34	23	53*	34	23
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	49*	53*	53*	44	53*	52*	39	53*	44	32	53*	38	26	53*	33	22	49*	29	20	43	25	17	38	22	15
		27-45	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	47*	56*	55*	40	54*	48*	35	48*	43*	30
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	55*	56*	56*	50*	56*	55*	41	53*	47*	34	46*	41	29	40	36	24	35	32	21	31	28	18
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	21	27	26	28	27	23	25	27	31	22
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	22	27	27	29	27	23	25	27	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	46	53	47	39	53	40	33	53	35	29	46	30	25	41	27	22	36	24	20
			Exposed	53	53	53	53	53	49	53	53	44	53	48	40	53	43	36	53	40	33	53	36	30	47	31	25	40	26	22	35	23	19	30	20	16	27	18	14	24	16	13
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	54*	59*	56*	43	59*	48	35	59*	42	30	58*	37	25	55*	32	22	49*	29	20
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	51*	59*	58*	45	59*	52*	39	59*	48	35	59*	44	31	59*	37	25	54*	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	55*	59*	59*	45	58*	52*	38	51*	46	33	45	40	28	40	36	24
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	50*	59*	59*	45	59*	55*	40	52*	47*	33	44	40	27	38	34	23	34	30	20	30	27	17	26	24	15
100	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31	22	22	28	22	22	25
		7-20	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	37	39	39	33
			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	37	39	38	32	39	34	28	39	30	25	39	26	22
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	49*	54*	54*	42*	54*	49*	36
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	41*	54*	46*	34	54*	41*	28	54*	36	25	54*	32	22
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	52*	53*	53*	45*
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	43*	53*	51*	37	50*	45*	32	44*	40*	28			
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	30	22	22	26
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	29	22	22	25	22	31	22	22	28	20	22	24	17
		7-20	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	34	39	36	30	39	32	26	39	28	23
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	36	30	39	31	26	39	27	22	36	24	20	32	21	17	28	19	15
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	44*	54*	50*	37	54*	44*	31	54*	38	27	54*	34	23
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	49*	54*	54*	44*	54*	52*	39	54*	44*	32	54*	38	26	54*	33	22	49*	29	20	43*	25	17	38	22	15
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	47*	53*	53*	40*	52*	48*	34	48*	43*	30
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	49*	53*	53*	41*	53*	47*	34	46*	41*	28	40*	36	24	35	32	21	31	28	18
	D	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	28	24	23	25	24	31	22
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	29	24	23	25	24	30	21	24	26	19	32	23	16	28	21	15
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	47	39	48	40	33	48	35	29	46	30	25	41	27	22	36	24	20
			Exposed	48	48	48	48	48	48	48	48	44	48	48	40	48	43	36	48	40	33	48	36	30	47	31	25	40	26	22	35	23	19	30	20	16	27	18	14	24	16	13
		20-27	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	43	53*	48*	35	53*	42	30	53*	37	25	52*	32	22	49*	29	20
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	45*	53*	52*	39	53*	48*	35	53*	44	31	53*	37	25	53*	32	22	47*	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	55*	56*	56*	45*	56*	53*	38	51*	46*	33	45*	41	28	40	36	24
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	50*	56*	56*	45*	56*	55*	40	52*	46*	33	44*	40	27	39	35	23	34	30	20	30	27	17	26	24	15

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	98	98	98	94	98	98	90	98	98	86	98	96	83	98	89	77	96	83	70	90	78	61	84	73	54	80	67	47	76	59	42
			Exposed	98	98	90	98	98	85	98	94	81	98	90	78	98	86	74	95	83	69	91	79	64	85	74	54	79	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	99	99	99	99	99	99	99	99	96	99	99	91	99	95	87	99	91	83	99	87	80	92	80	73	86	75	63	81	66	54	77	57	47	73	50	42	68	45	37
			Exposed	99	95	87	99	90	82	99	85	78	92	81	74	89	77	68	86	74	62	83	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	98	99	99	93	99	95	89	99	87	82	98	81	76	91	76	67	87	69	55	82	61	46	79	54	40
			Exposed	99	99	98	99	98	92	99	93	87	99	88	82	99	84	79	97	81	75	93	77	70	87	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97	100	100	93	100	96	86	97	89	80	90	84	75	84	79	69	79	74	59	75	68	51
			Exposed	100	100	100	100	100	96	100	100	92	100	97	87	100	93	83	97	89	80	92	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	98	98	93	98	98	88	98	97	84	98	93	80	98	89	77	98	85	73	94	82	69	87	76	58	82	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	98	88	77	97	84	72	92	80	66	88	77	60	85	73	54	81	69	49	78	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	99	99	90	99	93	85	99	88	81	97	84	77	91	80	72	88	77	67	85	73	61	80	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	91	80	72	87	76	65	84	70	58	80	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	99	99	99	99	99	95	99	96	90	99	91	85	99	87	81	99	83	78	96	80	74	89	74	61	84	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	99	87	81	99	82	77	94	78	72	90	75	64	87	69	55	84	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	100	100	100	100	100	100	100	100	95	100	100	90	100	96	86	100	92	83	96	88	79	88	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	100	95	86	99	91	82	93	86	78	89	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	98	98	86	98	94	81	98	90	78	98	86	74	95	82	69	91	79	63	87	76	58	81	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	94	82	69	90	78	62	86	75	55	82	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	99	90	82	99	85	78	92	81	74	89	77	68	85	73	61	82	68	56	79	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	85	73	61	81	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	99	98	92	99	93	87	99	88	82	99	84	78	97	80	75	92	77	69	89	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	96	80	74	91	76	67	88	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	100	100	97	100	100	92	100	97	87	100	92	83	96	88	80	91	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	96	88	79	90	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
10	B	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	88	83	88	88	77	88	83	70	88	78	61	84	73	54	80	67	47	76	59	42
			Exposed	88	88	88	88	88	85	88	88	81	88	88	78	88	86	74	88	83	69	88	79	64	85	74	54	79	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	88	83	88	87	80	88	80	73	86	75	63	81	66	54	77	57	47	73	50	42	68	45	37
			Exposed	88	88	87	88	88	82	88	85	78	88	81	74	88	77	68	86	74	62	83	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	95	89	96	87	82	96	81	76	91	76	67	87	69	55	82	61	46	79	54	40
			Exposed	96	96	96	96	96	92	96	93	87	96	88	82	96	84	79	96	81	75	93	77	70	87	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	98	98	93	98	96	86	97	89	80	90	84	75	84	79	69	79	74	59	75	68	51
			Exposed	98	98	98	98	98	96	98	98	92	98	97	87	98	93	83	97	89	80	92	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	88	88	88	88	88	88	88	88	84	88	88	80	88	88	77	88	85	73	88	82	69	87	76	58	82	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	88	88	77	88	84	72	88	80	66	88	77	60	85	73	54	81	69	49	78	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	88	88	88	88	88	85	88	88	81	88	84	77	88	80	72	88	77	67	85	73	61	80	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	88	80	72	87	76	65	84	70	58	80	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	96	96	96	96	96	95	96	96	90	96	91	85	96	87	81	96	83	78	96	80	74	89	74	61	84	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	96	87	81	96	82	77	94	78	72	90	75	64	87	69	55	84	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	98	98	98	98	98	98	98	98	95	98	98	90	98	96	86	98	92	83	96	88	79	88	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	98	95	86	98	91	82	93	86	78	89	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	88	88	86	88	88	81	88	88	78	88	86	74	88	82	69	88	79	63	87	76	58	81	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	88	82	69	88	78	62	86	75	55	82	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	88	88	82	88	85	78	88	81	74	88	77	68	85	73	61	82	68	56	79	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	85	73	61	81	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	97	97	92	97	93	87	97	88	82	97	84	78	97	80	75	92	77	69	89	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	96	80	74	91	76	67	88	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	99	99	97	99	99	92	99	97	87	99	92	83	96	88	80	91	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	96	88	79	90	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
20	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	70	78	78	70	78	78	61	78	73	54	78	67	47	76	59	42
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	64	78	74	54	78	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	75	63	78	66	54	77	57	47	73	50	42	68	45	37
			Exposed	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	62	78	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	82	89	81	76	89	76	67	87	69	55	82	61	46	79	54	40
			Exposed	89	89	89	89	89	89	89	89	87	89	88	82	89	84	79	89	81	75	89	77	70	87	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	86	92	89	80	90	84	75	84	79	69	79	74	59	75	68	51
			Exposed	92	92	92	92	92	92	92	92	92	92	92	87	92	92	83	92	89	80	92	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	73	78	78	69	78	76	58	78	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	78	78	77	78	78	72	78	78	66	78	77	60	78	73	54	78	69	49	78	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	77	78	78	72	78	77	67	78	73	61	78	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	78	78	72	78	76	65	78	70	58	78	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	89	89	89	89	89	89	89	89	89	89	89	85	89	87	81	89	83	78	89	80	74	89	74	61	84	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	89	87	81	89	82	77	89	78	72	89	75	64	87	69	55	84	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	90	92	92	86	92	92	83	92	88	79	88	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	92	92	86	92	91	82	92	86	78	89	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	63	78	76	58	78	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	78	78	69	78	78	62	78	75	55	78	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	78	78	78	78	78	78	78	78	74	78	77	68	78	73	61	78	68	56	78	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	78	73	61	78	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	90	90	90	90	90	87	90	88	82	90	84	78	90	80	75	90	77	69	89	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	90	80	74	90	76	67	88	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	93	93	93	93	93	92	93	93	87	93	92	83	93	88	80	91	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	93	88	79	90	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	70	77	77	61	77	73	54	77	67	47	76	59	42
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	69	77	77	64	77	74	54	77	66	46	75	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	75	63	78	66	54	77	57	47	73	50	42	68	45	37
			Exposed	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	62	78	69	57	77	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	83	81	76	83	76	67	83	69	55	82	61	46	79	54	40
			Exposed	83	83	83	83	83	83	83	83	83	83	83	82	83	83	79	83	81	75	83	77	70	83	70	55	82	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	80	87	84	75	84	79	69	79	74	59	75	68	51
			Exposed	87	87	87	87	87	87	87	87	87	87	87	87	87	87	83	87	87	80	87	85	77	85	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	69	77	76	58	77	69	50	77	61	43	71	53	38	64	47	50	57	42	45
			Exposed	77	77	77	77	77	72	77	77	66	77	77	60	77	73	54	77	69	49	77	64	45	72	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	77	78	78	72	78	77	67	78	73	61	78	62	51	75	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	78	78	72	78	76	65	78	70	58	78	64	53	77	58	48	75	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	83	78	83	80	74	83	74	61	83	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	83	83	81	83	82	77	83	78	72	83	75	64	83	69	55	83	63	49	81	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	83	87	87	79	87	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	87	87	86	87	87	82	87	86	78	87	82	74	84	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	63	78	76	58	78	68	49	76	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	78	78	69	78	78	62	78	75	55	78	69	50	78	64	45	75	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	78	78	78	78	78	78	78	78	74	78	77	68	78	73	61	78	68	56	78	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	78	73	61	78	66	54	78	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	85	85	85	85	85	85	85	85	82	85	84	78	85	80	75	85	77	69	85	73	60	83	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	85	80	74	85	76	67	85	71	57	84	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	88	88	88	88	88	88	88	88	87	88	88	83	88	88	80	88	85	76	87	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	88	88	79	88	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	61	71	71	54	71	67	47	71	59	42
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	64	71	71	54	71	66	46	71	57	40	68	50	53	60	44	47	53	39	42
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	63	74	66	54	74	57	47	73	50	42	68	45	37
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	74	62	74	69	57	74	58	48	72	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	76	67	79	69	55	79	61	46	79	54	40
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	77	70	79	70	55	79	60	45	77	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	75	82	79	69	79	74	59	75	68	51
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	77	82	79	69	79	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	58	71	69	50	71	61	43	71	53	38	64	47	50	57	42	45
			Exposed	71	71	71	71	71	71	71	71	66	71	71	60	71	71	54	71	69	49	71	64	45	71	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	67	74	73	61	74	62	51	74	53	44	69	46	38	62	40	50	54	36	44	48	48	39
			Exposed	74	74	72	74	74	65	74	70	58	74	64	53	74	58	48	74	53	43	71	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	74	79	74	61	79	64	50	79	56	41	75	49	35	70	43	30	65	38	39
			Exposed	79	79	79	79	79	77	79	78	72	79	75	64	79	69	55	79	63	49	79	58	44	76	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	73	81	76	63	76	69	52	68	61	45	60	54	38	53	48	33
			Exposed	82	82	82	82	82	82	82	82	78	82	82	74	82	79	69	81	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	74	63	74	74	58	74	68	49	74	59	42	69	51	36	61	45	48	54	39	42	48	53	37
			Exposed	74	74	69	74	74	62	74	74	55	74	69	50	74	64	45	74	58	41	71	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	76	76	76	76	76	76	76	76	74	76	76	68	76	73	61	76	68	56	76	62	51	74	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	76	73	61	76	66	54	76	59	49	75	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	78	81	80	75	81	77	69	81	73	60	81	63	48	79	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	81	80	74	81	76	67	81	71	57	81	64	50	81	58	44	78	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	83	85	85	80	85	85	76	84	81	73	80	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	85	85	79	85	84	76	85	80	70	81	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
50	B	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	54	65	67	47	65	59	42
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	54	65	65	46	65	57	40	65	50	53	60	44	47	53	39	42
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	66	54	67	57	47	67	50	42	67	45	37
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	57	67	58	48	67	50	41	66	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	67	75	69	55	75	61	46	75	54	40
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	70	55	75	60	45	75	52	38	73	45	32	67	40	41	60	35	37
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	74	59	75	68	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	73	57	72	65	48	63	57	41	56	50	35	50	44	48
	C	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	58	65	65	50	65	61	43	65	53	38	64	47	50	57	42	45
			Exposed	65	65	65	65	65	65	65	65	65	65	65	60	65	65	54	65	65	49	65	64	45	65	54	38	63	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	62	51	67	53	44	67	46	38	62	40	50	54	36	44	48	48	39
			Exposed	67	67	67	67	67	65	67	67	58	67	64	53	67	58	48	67	53	43	67	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	74	61	75	64	50	75	56	41	75	49	35	70	43	30	65	38	39
			Exposed	75	75	75	75	75	75	75	75	72	75	75	64	75	69	55	75	63	49	75	58	44	75	49	35	70	42	29	62	36	38	54	48	33	48	42	29	42	38	26
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	74	59	75	68	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	74	77	77	69	77	76	62	77	71	55	69	62	45	59	53	38	51	46	32	45	40	41	39	53	35	53	47	31
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	63	68	68	58	68	68	49	68	59	42	68	51	36	61	45	48	54	39	42	48	53	37
			Exposed	68	68	68	68	68	62	68	68	55	68	68	50	68	64	45	68	58	41	68	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	68	71	71	61	71	68	56	71	62	51	71	52	43	68	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	71	71	61	71	66	54	71	59	49	71	53	44	71	48	40	67	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	73	60	77	63	48	77	54	40	74	47	33	68	41	43	61	36	37	54	48	33
			Exposed	77	77	74	77	76	67	77	71	57	77	64	50	77	58	44	77	53	39	76	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	79	73	79	75	61	75	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	79	79	79	79	79	76	79	79	70	79	76	63	78	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	47	59	59	42
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	46	59	57	40	59	50	53	59	44	47	53	39	42
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	54	62	57	47	62	50	42	62	45	37
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	58	48	62	50	41	62	43	36	57	38	47	50	50	41	45	44	37
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	81	76	85	77	69
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	80	75	85	75	66	85	68	52	82	60	42	78	54	37
		27-45	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*	85	74*	74*	81	74*	84	77
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	86	74*	87	80	87	83	75	84	78	68	79	74	58	74	67	48
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	58	59	59	50	59	59	43	59	53	38	59	47	50	57	42	45
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	49	59	59	45	59	54	38	59	46	49	55	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	51	62	53	44	62	46	38	62	40	50	54	36	44	48	48	39
			Exposed	62	62	62	62	62	62	62	62	58	62	62	53	62	58	48	62	53	43	62	48	40	62	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	83	78	85	78	71	85	72	59	84	65	47	80	57	39
			Exposed	85	85	85	85	85	85	85	85	85	85	85	84	85	85	81	85	83	77	85	79	73	85	73	60	83	63	45	79	55	38	75	48	33	70	42	29	64	38	26
		27-45	Interior	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	87	74*	74*	83	74*	85	77	83	81	72	81	76	64	77	71	53
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	86	74*	74*	82	74*	87	79	87	81	72	81	76	62	75	69	50	68	60	41	59	53	35	53	47	31
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	62	49	62	59	42	62	51	36	61	45	48	54	39	42	48	53	37
			Exposed	62	62	62	62	62	62	62	62	55	62	62	50	62	62	45	62	58	41	62	53	38	62	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	56	65	62	51	65	52	43	65	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	65	65	61	65	65	54	65	59	49	65	53	44	65	48	40	65	44	36	62	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	73	60	74	63	48	74	54	40	73	47	33	68	41	43	61	36	37	54	48	33
			Exposed	74	74	74	74	74	67	74	71	57	74	64	50	74	58	44	74	53	39	74	49	35	69	41	44	60	53	37	52	46	32	46	40	28	40	36	25	54	32	22
		27-45	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	61	74	68	51	65	58	43	57	51	36	50	45	31	45	40	41
			Exposed	74	74	74	74	74	74	74	74	70	74	74	63	74	72	56	74	67	50	68	61	45	58	52	37	49	44	48	43	38	39	37	51	33	50	45	29	44	40	25
70	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	42
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	50	53	51	44	47	51	39	42
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	47	56	50	42	56	45	37
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	48	56	50	41	56	43	36	56	38	47	50	50	41	45	44	37
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	77	69
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	75	66	79	68	52	79	60	42	78	54	37
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	75	81	78	68	79	73	57	74	67	48
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	43	51	51	38	51	47	50	51	42	45
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	45	51	51	38	51	46	49	51	40	43	48	53	37	42	46	33	37	41	29
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	51	56	53	44	56	46	38	56	40	50	54	36	44	48	48	39
			Exposed	56	56	56	56	56	56	56	56	56	56	56	53	56	56	48	56	53	43	56	48	40	56	41	51	53	53	44	46	46	38	40	40	33	54	35	29	48	31	26
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	78	71	79	72	59	79	65	47	79	57	39
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	79	73	79	73	60	79	63	45	79	55	38	75	48	33	70	43	29	64	38	26
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	81	72	79	76	64	77	71	53
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	79	81	81	72	81	76	62	75	69	50	68	60	41	59	53	35	53	47	31
	D	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	49	57	57	42	57	51	36	57	45	48	54	39	42	48	53	37
			Exposed	57	57	57	57	57	57	57	57	55	57	57	50	57	57	45	57	57	41	57	53	38	57	45	48	53	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	56	60	60	51	60	52	43	60	45	37	59	39	48	52	51	42	45	45	37	40	40	33
			Exposed	60	60	60	60	60	54	60	59	49	60	53	44	60	48	40	60	44	36	60	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	84	82	77	84	77	69	84	70	54	82	62	43	79	54	37	75	48	33
			Exposed	84	84	84	84	84	84	84	84	81	84	83	78	84	80	74	84	76	68	84	72	59	83	62	44	78	53	37	73	46	32	68	40	28	61	36	25	54	32	22
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	84	84	76	82	79	70	79	75	59	75	68	49	68	60	41
			Exposed	85	85	85	85	85	85	85	85	85	85	85	83	85	85	79	85	84	76	85	81	72	80	75	60	74	67	48	65	58	39	57	51	33	50	45	29	44	40	25
80	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	45	53	45	44	47	45	39	42
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	63	73	68	56
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	73	73	62	73	65	54	73	57	47	72	50	41	67	44	37
		20-27	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	76	76	76	76	76	76	76	76	76	76	76	76	69
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	76	75	66	76	75	66	76	68	52	76	60	42	76	54	37
		27-45	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	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	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	76	76	76	75	76	76	68	76	73	57	74	67	48
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	38	45	45	50	45	42	45
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	38	45	45	45	45	45	49	45	40	43	45	53	37	42	46	33	37	41	29
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	67	73	69	58	73	61	50	73	54	44	70	48	39
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	66	73	72	60	73	61	51	73	53	44	68	46	38	61	40	33	54	35	29	48	31	26
		20-27	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	76	76	76	71	76	72	59	76	65	47	76	57	39
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	73	60	76	63	45	76	55	38	75	48	33	70	43	29	64	38	26
		27-45	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	76	76	76	76	76	76	72	76	76	64	76	71	53
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	76	62	75	69	50	68	60	41	59	53	35	53	47	31
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	42	50	50	36	50	45	48	50	39	42	48	53	37
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	41	50	50	38	50	45	48	50	39	41	46	50	36	40	44	31	53	39	28	47	35	25
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	52	43	54	45	37	54	39	48	52	51	42	45	45	37	40	40	33
			Exposed	54	54	54	54	54	54	54	54	49	54	53	44	54	48	40	54	44	36	54	40	50	52	52	43	45	44	37	39	38	32	51	34	28	45	30	25	40	26	22
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	77	69	79	70	54	79	62	43	78	54	37	75	48	33
			Exposed	79	79	79	79	79	79	79	79	79	79	78	79	79	74	79	76	68	79	72	59	79	62	44	78	53	37	73	46	32	68	40	28	61	36	25	54	32	22
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	80	79	70	78	75	59	75	68	49	68	60	41
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	80	76	80	80	72	80	75	60	74	67	48	65	58	39	57	51	33	50	45	29	44	40	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	53	40	40	47	40	39	42
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	56
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	54	65	57	47	65	50	41	65	44	37
		20-27	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*	69
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	66	74*	68	52	74*	60	42	74*	54	37
		27-45	Interior	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~
			Exposed	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~68~~	~~72*~~	~~72*~~	~~58~~	~~72*~~	~~67~~	~~48~~
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	50	40	40	45
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	49	40	40	43	40	53	37	40	46	~~33~~	37	41	~~29~~
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	58	65	61	50	65	54	44	65	48	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	61	51	65	53	44	65	46	38	61	40	~~33~~	54	~~35~~	~~29~~	48	~~31~~	~~26~~
		20-27	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*	71	74*	72	59	74*	65	47	74*	57	39
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	73	74*	73	60	74*	63	45	74*	55	38	74*	48	33	70	43	29	64	38	~~26~~
		27-45	Interior	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~
			Exposed	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~63~~	~~72*~~	~~69~~	~~50~~	~~68~~	~~60~~	~~41~~	~~60~~	~~53~~	~~35~~	~~53~~	~~47~~	~~31~~
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	36	45	45	48	45	39	42	45	53	37
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	41	45	45	38	45	45	48	45	39	41	45	50	36	40	44	~~31~~	53	39	~~28~~	47	~~35~~	~~25~~
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	65	72	68	56	72	58	48	72	51	42	68	45	37	61	40	~~33~~
			Exposed	72	72	72	72	72	72	72	72	72	72	72	67	72	72	60	72	67	55	72	61	50	72	52	43	67	44	37	58	38	~~32~~	51	~~34~~	~~28~~	45	~~30~~	~~25~~	40	~~26~~	~~22~~
		20-27	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	69	76	70	54	76	62	43	76	54	37	75	48	33
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	76	76	68	76	72	59	76	62	44	76	53	37	73	46	32	68	40	~~28~~	61	36	~~25~~	54	~~32~~	~~22~~
		27-45	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	76	76	76	70	76	75	59	75	68	49	68	60	41
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	75	60	74	67	48	65	58	39	57	51	33	50	45	29	44	40	~~25~~
100	B	0-7	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
			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	53	36	36	47	36	36	42
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	54	62	57	47	62	50	41	62	44	37
		20-27	Interior	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~69*~~
			Exposed	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~66~~	~~70*~~	~~68*~~	~~52~~	~~70*~~	~~60~~	~~42~~	~~70*~~	~~54~~	~~37~~
		27-45	Interior	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~
			Exposed	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~68*~~	~~69*~~	~~69*~~	~~57~~	~~69*~~	~~67*~~	~~48~~
	C	0-7	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	50	36	36	45
			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	49	36	36	43	36	53	37	36	46	~~33~~	36	41	~~29~~
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	61	50	62	54	44	62	48	39
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	61	51	62	53	44	62	46	38	61	40	~~33~~	54	~~35~~	~~29~~	48	~~31~~	~~26~~
		20-27	Interior	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~59~~	~~70*~~	~~65~~	~~47~~	~~70*~~	~~57~~	~~39~~
			Exposed	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~70*~~	~~60~~	~~70*~~	~~63~~	~~45~~	~~70*~~	~~55~~	~~38~~	~~70*~~	~~48~~	~~33~~	~~70*~~	~~43~~	~~29~~	~~64~~	~~38~~	~~26~~
		27-45	Interior	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~64*~~	~~69*~~	~~69*~~	~~53~~
			Exposed	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~69*~~	~~62~~	~~69*~~	~~69*~~	~~50~~	~~68*~~	~~60~~	~~41~~	~~59~~	~~53~~	~~35~~	~~53~~	~~47~~	~~31~~
	D	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	48	40	39	42	40	53	37
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	48	40	39	41	40	50	36	40	44	~~31~~	53	39	~~28~~	47	~~35~~	~~25~~
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	56	65	58	48	65	51	42	65	45	37	61	40	~~33~~
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	65	55	65	61	50	65	52	43	65	44	37	58	38	~~32~~	51	~~34~~	~~28~~	45	~~30~~	~~25~~	40	~~26~~	~~22~~
		20-27	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*	69	74*	70	54	74*	62	43	74*	54	37	74*	48	33
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	68	74*	72	59	74*	62	44	74*	53	37	73	46	32	68	40	~~28~~	61	36	~~25~~	54	~~32~~	~~22~~
		27-45	Interior	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~70*~~	~~72*~~	~~72*~~	~~60~~	~~72*~~	~~68~~	~~49~~	~~68~~	~~61~~	~~42~~
			Exposed	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~72*~~	~~61~~	~~72*~~	~~67~~	~~48~~	~~65~~	~~58~~	~~39~~	~~57~~	~~51~~	~~34~~	~~50~~	~~45~~	~~29~~	~~44~~	~~40~~	~~25~~

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10	Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.
~~10~~	Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	75	78	78	70	78	78	66	78	76	58	78	69	44	76	58	35	70	47	31	61	39	27	51	33	23	43	29	31
			Exposed	78	78	70	78	78	64	78	74	54	78	70	46	78	65	40	75	57	35	71	50	32	62	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	~~21~~
		7-20	Interior	78	78	78	78	78	78	78	78	76	78	78	72	78	75	67	78	71	58	78	67	49	72	51	37	65	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	78	75	67	78	70	55	77	64	46	73	53	38	69	45	34	64	38	31	57	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	~~18~~
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	78	74	79	75	69	79	67	54	77	53	41	71	42	32	66	34	27	56	30	23	49	27	20
			Exposed	79	79	77	79	77	72	79	73	67	79	68	56	79	61	47	77	52	40	73	45	34	66	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	~~18~~
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	79	74	79	76	66	77	69	52	70	59	41	61	48	34	48	39	29	39	34	25
			Exposed	79	79	79	79	79	76	79	79	72	79	77	67	79	73	59	76	69	51	73	63	44	62	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	78	78	73	78	78	68	78	77	60	78	73	51	78	68	44	77	63	38	75	55	34	67	43	29	55	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	78	68	44	77	60	37	73	52	33	68	45	30	62	39	27	54	35	24	47	32	22	37	27	28	31	23	24	27	30	~~21~~	24	26	~~18~~	32	23	~~16~~	28	~~20~~	~~14~~
		7-20	Interior	78	78	70	78	74	63	78	68	52	76	60	43	71	51	37	68	43	33	62	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	~~19~~
			Exposed	71	50	36	67	41	32	59	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	~~22~~	23	23	~~19~~	30	~~20~~	~~16~~	27	~~17~~	~~14~~	24	~~15~~	~~13~~
		20-27	Interior	79	79	79	79	79	75	79	76	70	79	72	65	79	67	53	79	59	45	76	51	38	69	38	30	60	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	79	67	53	78	56	43	75	47	36	70	40	31	66	35	27	59	32	24	53	29	22	43	24	26	36	21	22	31	27	~~19~~	27	24	~~16~~	24	~~21~~	~~14~~	32	~~19~~	~~13~~
		27-45	Interior	79	79	79	79	79	78	79	79	75	79	79	70	79	76	66	78	72	57	76	68	49	68	54	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	79	76	66	78	71	55	74	66	46	69	56	39	62	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	~~17~~	26	23	~~15~~
	D	0-7	Interior	78	78	65	78	74	54	78	70	46	78	64	39	75	56	34	71	49	31	67	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	~~21~~	24	26	~~19~~
			Exposed	75	55	34	70	47	31	64	40	27	55	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	~~20~~	23	25	~~18~~	30	22	~~15~~	26	~~19~~	~~14~~	23	~~17~~	~~12~~
		7-20	Interior	78	71	56	77	64	46	73	53	38	68	44	33	63	38	30	56	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	~~21~~	23	22	~~18~~	30	~~20~~	~~16~~
			Exposed	62	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	~~21~~	22	22	~~18~~	29	~~19~~	~~16~~	25	~~17~~	~~14~~	22	~~15~~	~~12~~	~~20~~	~~13~~	~~11~~			
		20-27	Interior	79	77	73	79	73	67	79	68	56	79	60	46	76	51	39	73	44	34	69	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	~~18~~	27	24	~~16~~
			Exposed	76	51	38	71	42	32	67	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	~~18~~	26	23	~~16~~	23	~~20~~	~~14~~	30	~~18~~	~~12~~	27	~~16~~	~~11~~
		27-45	Interior	79	79	76	79	79	72	79	76	67	79	73	58	76	68	50	72	62	43	68	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	76	68	49	71	59	41	65	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	~~19~~	28	25	~~16~~	25	22	~~14~~	22	~~20~~	~~12~~
10	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	67	58	67	67	44	67	58	35	67	47	31	61	39	27	51	33	23	43	29	31
			Exposed	67	67	67	67	67	64	67	67	54	67	67	46	67	65	40	67	57	35	67	50	32	62	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	~~21~~
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	68	68	58	68	67	49	68	51	37	65	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	68	68	67	68	68	55	68	64	46	68	53	38	68	45	34	64	38	31	57	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	~~18~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	75	69	77	67	54	77	53	41	71	42	32	66	34	27	56	30	23	49	27	20
			Exposed	77	77	77	77	77	72	77	73	67	77	68	56	77	61	47	77	52	40	73	45	34	66	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	~~18~~
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	74	78	76	66	77	69	52	70	59	41	61	48	34	48	39	29	39	34	25
			Exposed	78	78	78	78	78	76	78	78	72	78	77	67	78	73	59	76	69	51	73	63	44	62	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	67	67	67	67	67	67	67	67	60	67	67	51	67	67	44	67	63	38	67	55	34	67	43	29	55	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	67	67	44	67	60	37	67	52	33	67	45	30	62	39	27	54	35	24	47	32	22	37	27	28	31	23	24	27	30	~~21~~	24	26	~~18~~	32	23	~~16~~	28	~~20~~	~~14~~
		7-20	Interior	68	68	68	68	68	63	68	68	52	68	60	43	68	51	37	68	43	33	62	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	~~19~~
			Exposed	68	50	36	67	41	32	59	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	~~22~~	23	23	~~19~~	30	~~20~~	~~16~~	27	~~17~~	~~14~~	24	~~15~~	~~13~~
		20-27	Interior	77	77	77	77	77	75	77	76	70	77	72	65	77	67	53	77	59	45	76	51	38	69	38	30	60	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	77	67	53	77	56	43	75	47	36	70	40	31	66	35	27	59	32	24	53	29	22	43	24	26	36	21	22	31	27	~~19~~	27	24	~~16~~	24	~~21~~	~~14~~	32	~~19~~	~~13~~
		27-45	Interior	78	78	78	78	78	78	78	78	75	78	78	70	78	76	66	78	72	57	76	68	49	68	54	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	78	76	66	78	71	55	74	66	46	69	56	39	62	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	~~17~~	26	23	~~15~~
	D	0-7	Interior	67	67	65	67	67	54	67	67	46	67	64	39	67	56	34	67	49	31	67	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	~~21~~	24	26	~~19~~
			Exposed	67	55	34	67	47	31	64	40	27	55	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	~~20~~	23	25	~~18~~	30	22	~~15~~	26	~~19~~	~~14~~	23	~~17~~	~~12~~
		7-20	Interior	68	68	56	68	64	46	68	53	38	68	44	33	63	38	30	56	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	~~21~~	23	22	~~18~~	30	~~20~~	~~16~~
			Exposed	62	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	~~21~~	22	22	~~18~~	29	~~19~~	~~16~~	25	~~17~~	~~14~~	22	~~15~~	~~12~~	~~20~~	~~13~~	~~11~~			
		20-27	Interior	77	77	73	77	73	67	77	68	56	77	60	46	76	51	39	73	44	34	69	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	~~18~~	27	24	~~16~~
			Exposed	76	51	38	71	42	32	67	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	~~18~~	26	23	~~16~~	23	~~20~~	~~14~~	30	~~18~~	~~12~~	27	~~16~~	~~11~~
		27-45	Interior	79	79	76	79	79	72	79	76	67	79	73	58	76	68	50	72	62	43	68	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	76	68	49	71	59	41	65	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	~~19~~	28	25	~~16~~	25	22	~~14~~	22	~~20~~	~~12~~
20	B	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	44	54	54	35	54	47	31	54	39	27	51	33	23	43	29	31
			Exposed	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	54	35	54	50	32	54	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	~~21~~
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	51	37	54	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	54	54	54	54	54	54	54	54	46	54	53	38	54	45	34	54	38	31	54	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	~~18~~
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	69	71*	67	54	71*	53	41	71*	42	32	66	34	27	56	30	23	49	27	20
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	67	71*	68	56	71*	61	47	71*	52	40	71*	45	34	66	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	~~18~~
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	67*	70*	69*	52	70*	59	41	61	48	34	48	39	29	39	34	25
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	59	70*	69*	51	70*	63	44	62	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	51	54	54	44	54	54	38	54	54	34	54	43	29	54	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	54	54	44	54	54	37	54	52	33	54	45	30	54	39	27	54	35	24	47	32	22	37	27	28	31	23	24	27	30	~~21~~	24	26	~~18~~	32	23	~~16~~	28	~~20~~	~~14~~
		7-20	Interior	54	54	54	54	54	54	54	54	52	54	54	43	54	51	37	54	43	33	54	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	~~19~~
			Exposed	54	50	36	54	41	32	54	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	~~22~~	23	23	~~19~~	30	~~20~~	~~16~~	27	~~17~~	~~14~~	24	~~15~~	~~13~~
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	65	71*	67	53	71*	59	45	71*	51	38	69	38	30	60	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	71*	67	53	71*	56	43	71*	47	36	70*	40	31	66	35	27	59	32	24	53	29	22	43	24	26	36	21	22	31	27	~~19~~	27	24	~~16~~	24	~~21~~	~~14~~	32	~~19~~	~~13~~
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	67*	70*	70*	57	70*	68*	49	68*	54	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	70*	70*	66	70*	70*	55	70*	67*	46	69*	56	39	62	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	~~17~~	26	23	~~15~~
	D	0-7	Interior	54	54	54	54	54	54	54	54	46	54	54	39	54	54	34	54	49	31	54	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	~~21~~	24	26	~~19~~
			Exposed	54	54	34	54	47	31	54	40	27	54	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	~~20~~	23	25	~~18~~	30	22	~~15~~	26	~~19~~	~~14~~	23	~~17~~	~~12~~
		7-20	Interior	54	54	54	54	54	46	54	53	38	54	44	33	54	38	30	54	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	~~21~~	23	22	~~18~~	30	~~20~~	~~16~~
			Exposed	54	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	~~21~~	22	22	~~18~~	29	~~19~~	~~16~~	25	~~17~~	~~14~~	22	~~15~~	~~12~~	~~20~~	~~13~~	~~11~~			
		20-27	Interior	70	70	70	70	70	67	70	68	56	70	60	46	70	51	39	70	44	34	69	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	~~18~~	27	24	~~16~~
			Exposed	70	51	38	70	42	32	67	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	~~18~~	26	23	~~16~~	23	~~20~~	~~14~~	30	~~18~~	~~12~~	27	~~16~~	~~11~~
		27-45	Interior	72*	72*	72*	72*	72*	72*	72*	72*	67	72*	72*	58	72*	68	50	72*	62	43	68	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	72*	68	49	71*	59	41	65	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	~~19~~	28	25	~~16~~	25	22	~~14~~	22	~~20~~	~~12~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	44	52	52	35	52	47	31	52	39	27	51	33	23	43	29	31
			Exposed	52	52	52	52	52	52	52	52	52	52	52	46	52	52	40	52	52	35	52	50	32	52	39	27	49	33	23	40	28	30	34	25	26	30	22	23	26	29	21
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	51	37	54	39	31	54	33	27	46	28	23	39	25	31	34	22	28
			Exposed	54	54	54	54	54	54	54	54	46	54	53	38	54	45	34	54	38	31	54	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	18
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	41	62*	42	32	62*	34	27	56	30	23	49	27	20			
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56	62*	61*	47	62*	52	40	62*	45	34	62*	35	27	55	30	22	46	26	19	39	22	24	34	30	20	30	27	18
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	52	64*	59*	41	61*	48	34	48	39	29	39	34	25			
			Exposed	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	59*	64*	64*	51	64*	63*	44	62*	48	34	47	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	51	52	52	44	52	52	38	52	52	34	52	43	29	52	35	25	44	30	21	37	26	28	32	23	25	28	31	22
			Exposed	52	52	44	52	52	37	52	52	33	52	45	30	52	39	27	52	35	24	47	32	22	37	27	28	31	23	24	27	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	54	54	54	54	54	54	54	54	52	54	54	43	54	51	37	54	43	33	54	37	30	50	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	19
			Exposed	54	50	36	54	41	32	54	35	29	52	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	22	23	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	53	62*	59*	45	62*	51	38	62*	38	30	60*	32	25	50	28	20	43	24	26	36	21	22	32	28	19
			Exposed	62*	62*	53	62*	56	43	62*	47	36	62*	40	31	62*	35	27	59*	32	24	53	29	22	43	24	26	36	21	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	57*	64*	64*	49	64*	55*	38	53	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	64*	64*	64*	64*	64*	55*	64*	64*	46	64*	57*	39	62*	48	34	52	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	17	26	23	15
	D	0-7	Interior	54	54	54	54	54	54	54	54	46	54	54	39	54	54	34	54	49	31	54	43	29	53	34	24	42	29	31	35	25	27	30	22	24	27	29	21	24	26	19
			Exposed	54	54	34	54	47	31	54	40	27	54	35	25	48	32	22	42	29	31	37	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	54	54	54	54	54	46	54	53	38	54	44	33	54	38	30	54	33	28	50	31	25	41	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	54	37	30	54	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	64*	64*	64*	64*	64*	64*	64*	64*	56	64*	60	46	64*	51	39	64*	44	34	64*	38	30	59	31	24	48	27	20	40	23	25	35	31	21	30	27	18	27	24	16
			Exposed	64*	51	38	64*	42	32	64*	35	28	60	32	25	53	29	22	48	26	19	43	24	26	35	31	21	30	26	18	26	23	16	23	20	14	30	18	12	27	16	11
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	59*	65*	65*	50	65*	62*	43	65*	53	37	51	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	65*	65*	49	65*	60*	41	65*	50	35	53	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	19	28	25	16	25	22	14	22	20	12
40	B	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	35	43	43	31	43	39	27	43	33	23	43	33	23	43	29	31
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	43	32	43	39	27	43	33	23	40	28	30	34	25	26	30	22	23	26	29	21
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	39	31	46	33	27	46	28	23	39	25	31	34	22	28
			Exposed	46	46	46	46	46	46	46	46	46	46	46	38	46	45	34	46	38	31	46	34	28	46	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	18
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	54*	56*	53*	41	56*	42	32	56*	34	27	56*	30	23	49*	27	20
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	47	56*	52*	40	56*	45	34	56*	35	27	55*	30	22	46	26	19	39	22	24	34	30	20	30	27	18
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	52*	59*	59*	41	59*	48*	34	48*	39	29	39	34	25
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	51*	59*	59*	44	59*	49*	34	47*	38	28	36	32	24	31	28	20	28	25	26	25	22	23
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	38	43	43	34	43	43	29	43	35	25	43	30	21	37	26	28	32	23	25	28	31	22
			Exposed	43	43	43	43	43	37	43	43	33	43	43	30	43	39	27	43	35	24	43	32	22	37	27	28	31	23	24	27	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	43	46	46	37	46	43	33	46	37	30	46	31	25	42	26	22	35	23	29	31	30	25	27	27	22	24	24	19
			Exposed	46	46	36	46	41	32	46	35	29	46	32	26	46	29	24	41	26	22	37	24	30	31	30	25	26	26	22	23	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	53*	56*	56*	45	56*	51*	38	56*	38	30	56*	32	25	50*	28	20	43	24	26	36	21	22	32	28	19
			Exposed	56*	56*	53*	56*	56*	43	56*	47	36	56*	40	31	56*	35	27	56*	32	24	53*	29	22	43	24	26	36	21	22	31	27	19	27	24	16	24	21	14	32	19	13
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	57*	59*	59*	49*	59*	54*	38	53*	42	31	41	35	26	34	30	22	30	27	19	26	24	25
			Exposed	59*	59*	59*	59*	59*	55*	59*	59*	47*	59*	56*	39	59*	48*	34	52*	42	30	44	36	27	34	31	22	29	26	28	25	23	24	22	30	20	29	26	17	26	23	15
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	39	46	46	34	46	46	31	46	43	29	46	34	24	42	29	31	35	25	27	30	22	24	27	29	21	24	26	19
			Exposed	46	46	34	46	46	31	46	40	27	46	35	25	46	32	22	42	29	31	37	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	49	49	49	49	49	46	49	49	38	49	44	33	49	38	30	49	33	28	49	31	25	41	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	49	37	30	49	33	27	47	29	24	42	26	22	37	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	46	59*	51	39	59*	44	34	59*	38	30	59*	31	24	48	27	20	40	23	25	35	31	21	30	27	18	27	24	16
			Exposed	59*	51	38	59*	42	32	59*	35	28	59*	32	25	53*	29	22	48	26	19	43	24	26	35	31	21	30	26	18	26	23	16	23	20	14	30	18	12	27	16	11
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	58*	60*	60*	50*	60*	60*	43	60*	53*	37	51*	41	30	39	34	25	32	29	21	28	25	27	25	22	23	22	30	20
			Exposed	60*	60*	50*	60*	59*	41	60*	50*	35	53*	43	31	45	37	28	38	33	25	34	30	22	29	26	27	24	22	23	21	29	19	28	25	16	25	22	14	22	20	12
50	B	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	31	35	35	27	35	33	23	35	29	31
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	27	35	33	23	35	28	30	34	25	26	30	22	23	26	29	21
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	31	38	33	27	38	28	23	38	25	31	34	22	28
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	31	38	34	28	38	29	24	38	25	31	33	21	27	28	28	23	25	25	20	22	22	18
		20-27	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	61	68*	63*	49	68*	52	41	68*	46	35	68*	41	30			
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	60	68*	67*	52	68*	52	41	68*	45	34	68*	39	28	59	34	24	51	30	20	45	27	18
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	63*	67*	67*	51	67*	60*	44	60*	51	38			
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	66*	67*	67*	52	67*	58	43	55	49	36	47	43	31	42	37	26	37	33	23
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	25	35	30	21	35	26	28	32	23	25	28	31	22
			Exposed	35	35	35	35	35	35	35	35	33	35	35	30	35	35	27	35	35	24	35	32	22	35	27	28	31	23	24	27	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	33	38	37	30	38	31	25	38	26	22	35	23	29	31	30	25	27	27	22	24	24	19
			Exposed	38	38	36	38	38	32	38	35	29	38	32	26	38	29	24	38	26	22	37	24	30	31	30	25	26	26	22	23	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	67*	68*	68*	58	68*	58	45	68*	48	37	68*	42	31	64*	36	26	55	32	22	49	28	19
			Exposed	68*	68*	68*	68*	68*	65*	68*	68*	54	68*	60	47	68*	52	41	68*	48	37	68*	43	33	65*	37	26	54	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	57	67*	64*	47	62*	52	39	51	46	33	45	40	29	40	36	25
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	60*	67*	67*	52	67*	63*	46	66*	55	41	51	46	34	44	40	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	31	39	39	29	39	34	24	39	29	31	35	25	27	30	22	24	27	29	21	24	26	19
			Exposed	39	39	34	39	39	31	39	39	27	39	35	25	39	32	22	39	29	31	37	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	42	42	42	42	42	42	42	42	38	42	42	33	42	38	30	42	33	28	42	31	25	41	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	42	37	30	42	33	27	42	29	24	42	26	22	37	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	46*	52*	51*	39	52*	44	34	52*	38	30	52*	31	24	48*	27	20	40	23	25	35	31	21	30	27	18	27	24	16
			Exposed	52*	51*	38	52*	42	32	52*	35	28	52*	32	25	52*	29	22	48*	26	19	43	24	26	35	31	21	30	26	18	26	23	16	23	20	14	30	18	12	27	16	11
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	65*	69*	69*	57	69*	63	46	59	51	38	49	44	32	43	38	27	38	34	23	34	30	20
			Exposed	69*	69*	69*	69*	69*	63	69*	69*	53	69*	65*	47	67*	56	42	58	50	37	51	46	34	43	39	27	37	33	23	32	29	19	28	25	16	25	22	14	22	20	12

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	29	31
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	28	30	30	25	26	30	22	23	26	29	21
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	58	47	58	49	41	58	43	35	58	38	31	51	34	28
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	51	58	58	46	58	51	42	58	43	36	58	37	31	49	32	27	43	28	23	38	25	20	34	22	18
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	49	62*	52	41	62*	46	35	62*	41	30
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	60*	62*	62*	52	62*	52	41	62*	45	34	62*	39	28	59*	34	24	51	30	20	45	27	18
		27-45	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	52*	61*	59*	44	59*	51	38
			Exposed	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	52*	61*	58*	43	55*	49	36	47	43	31	42	37	26	37	33	23
	C	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	25	30	30	21	30	26	28	30	23	25	28	31	22
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	27	28	30	23	24	27	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	50	58	56	46	58	47	38	58	40	33	53	35	29	46	30	25	41	27	22	36	24	19
			Exposed	58	58	55	58	58	49	58	53	44	58	48	39	58	43	36	58	39	33	55	36	30	47	30	25	40	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	58*	62*	58*	45	62*	48	37	62*	42	31	61*	36	26	55*	32	22	49	28	19
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	54*	62*	60*	47	62*	52	41	62*	48	37	62*	43	33	62*	37	26	54*	32	22	47	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	57*	61*	61*	47	61*	52*	39	51	46	33	45	40	29	40	36	25
			Exposed	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	59*	61*	61*	52*	61*	61*	46	61*	55*	41	52*	46	34	44	40	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	24	33	29	31	33	25	27	30	22	24	27	29	21	24	26	19
			Exposed	33	33	33	33	33	31	33	33	27	33	33	25	33	32	22	33	29	31	33	26	28	31	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	33	28	36	31	25	36	26	21	34	22	28	29	29	24	26	25	21	23	22	18	30	20	16
			Exposed	36	36	30	36	33	27	36	29	24	36	26	22	36	24	30	33	22	27	31	30	25	26	26	21	22	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	59	64*	64*	51	64*	57	45	64*	47	36	64*	40	30	61*	35	25	52	31	21	46	27	18	41	24	16
			Exposed	64*	64*	58	64*	63*	49	64*	53	43	64*	48	37	64*	44	33	64*	40	29	64*	36	26	53	31	21	45	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	57*	64*	62*	46	59*	51	38	49	44	32	43	38	27	38	34	23	33	30	20
			Exposed	64*	64*	64*	64*	64*	62*	64*	64*	53	64*	64*	47	64*	55	42	58*	50	37	51	46	34	43	39	27	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12
70	B	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	31
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	30	26	25	26	26	22	23	26	29	21
		7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	49	41	51	43	35	51	38	31	51	34	28
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	42	51	43	36	51	37	31	49	32	27	43	28	23	38	25	20	34	22	18
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	49*	56*	52*	41	56*	46	35	56*	41	30
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	52*	56*	52*	41	56*	45	34	56*	39	28	56*	34	24	51*	30	20	45	27	18
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	51*	57*	57*	44	57*	51*	38
			Exposed	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	52*	57*	57*	43	55*	49*	36	48*	43	31	42	37	26	37	33	23
	C	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	21	26	26	28	26	23	25	26	31	22
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	28	26	23	24	26	30	21	24	26	18	32	23	16	28	20	14
		7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	46	51	47	38	51	40	33	51	35	29	46	30	25	41	27	22	36	24	19
			Exposed	51	51	51	51	51	49	51	51	44	51	48	39	51	43	36	51	39	33	51	36	30	47	30	25	40	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	45	56*	48*	37	56*	42	31	56*	36	26	55*	32	22	49*	28	19
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	54*	56*	56*	47*	56*	52*	41	56*	48*	37	56*	43	33	56*	37	26	54*	32	22	47*	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	47*	57*	52*	39	51*	46*	33	45*	40	29	40	36	25
			Exposed	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	52*	57*	57*	46*	57*	55*	41	51*	46*	34	44	40	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	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	31	28	25	27	28	22	24	27	29	21	24	26	19
			Exposed	28	28	28	28	28	28	28	28	27	28	28	25	28	28	22	28	28	31	28	26	28	28	22	24	26	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	51	56	56	46	56	51	42	56	46	38	56	39	32	51	33	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	56	56	46	56	49	41	56	44	37	56	40	33	56	36	30	51	33	27	46	30	25	39	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	61*	59*	61*	61*	51	61*	57*	45	61*	47	36	61*	40	30	60*	35	25	52*	31	21	46	27	18	41	24	16
			Exposed	61*	61*	58*	61*	61*	49	61*	53*	43	61*	48	37	61*	44	33	61*	40	29	61*	36	26	53*	31	21	45	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	56*	60*	60*	46	59*	51*	38	49*	44	32	43	38	27	38	34	23	33	30	20
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	53*	60*	60*	47	60*	55*	42	57*	50*	37	51*	46	34	43	39	27	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12
80	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	30	22	22	26	22	22	23	22	29	21
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	38	31	40	34	28
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	37	31	40	32	27	40	28	23	38	25	20	34	22	18
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	49*	55*	52*	41	55*	46*	35	55*	41	30
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	52*	55*	52*	41	55*	45*	34	55*	39	28	55*	34	24	51*	30	20	45*	27	18
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	51*	54*	54*	44*	54*	51*	38
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	52*	54*	54*	43*	54*	49*	36	47*	43*	31	42*	37	26	37	33	23
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	28	22	22	25	22	31	22
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	28	22	22	24	22	30	21	22	26	18	32	23	16	28	20	14
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	33	40	35	29	40	30	25	40	27	22	36	24	19
			Exposed	40	40	40	40	40	40	40	40	40	40	40	39	40	40	36	40	39	33	40	36	30	40	30	25	40	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	45*	55*	48*	37	55*	42*	31	55*	36	26	55*	32	22	49*	28	19
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	54*	55*	55*	47*	55*	52*	41	55*	48*	37	55*	43*	33	55*	37	26	54*	32	22	47*	27	19	41	24	16	36	21	14	32	19	13
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	47*	54*	52*	40*	51*	46*	33	45*	40*	29	40*	36	25
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	52*	54*	54*	46*	54*	54*	41*	51*	46*	34	44*	40*	28	38	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	31	25	25	27	25	22	24	25	29	21	24	26	19
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	22	25	25	31	25	25	28	25	22	24	25	29	20	23	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	38	45	39	32	45	33	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	45	45	45	45	45	41	45	44	37	45	40	33	45	36	30	45	33	27	45	30	25	39	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	51*	55*	55*	45	55*	47*	36	55*	40	30	55*	35	25	52*	31	21	46*	27	18	41	24	16
			Exposed	55*	55*	55*	55*	55*	49*	55*	53*	43	55*	48*	37	55*	44	33	55*	40	29	55*	36	26	53*	31	21	45	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	46*	57*	51*	38	49*	44*	32	43	38	27	38	34	23	34	30	20
			Exposed	57*	57*	57*	57*	57*	57*	57*	57*	53*	57*	57*	47*	57*	56*	42	57*	50*	37	51*	46*	34	43	39	28	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30	20	20	26	20	20	23	20	29	21
		7-20	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	35	36	36	31	36	34	28
			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	31	36	32	27	36	28	23	36	25	20	34	22	18
		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*	41*	44*	44*	35	44*	41*	30
			Exposed	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	41*	44*	44*	34	44*	39*	28	44*	34	24	44*	30	20	44*	27	18
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	44*	50*	50*	38*
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	43*	51*	49*	36*	47*	43*	31	42*	38*	26	37*	33	23
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	28	20	20	25	20	30	22
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	28	20	20	24	20	30	21	20	26	18	30	23	16	28	20	14
		7-20	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	33	36	35	29	36	30	25	36	27	22	36	24	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	30	25	36	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		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*	37	44*	42*	31	44*	36	26	44*	32	22	44*	28	19
			Exposed	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	41*	44*	44*	37	44*	43*	33	44*	37	26	44*	32	22	44*	27	19	41*	24	16	36	21	14	32	19	13
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	39*	49*	46*	33	45*	40*	29	40*	36*	25
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	46*	51*	51*	41*	51*	46*	34	44*	40*	28	38*	34	24	33	30	20	29	26	17	26	23	15
	D	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31	22	22	27	22	22	24	22	29	21	22	26	19
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	31	22	22	28	22	22	24	22	29	20	22	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	39	32	40	33	28	40	29	24	39	25	21	34	22	18	30	20	16
			Exposed	40	40	40	40	40	40	40	40	37	40	40	33	40	36	30	40	33	27	40	30	25	39	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	51*	55*	55*	45*	55*	47*	36	55*	40	30	55*	35	25	52*	31	21	46*	27	18	41*	24	16
			Exposed	55*	55*	55*	55*	55*	49*	55*	53*	43*	55*	48*	37	55*	44*	33	55*	40	29	55*	36	26	53*	31	21	45*	26	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	46*	54*	51*	38	49*	44*	32	43*	38	27	38	34	23	33	30	20
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	53*	54*	54*	47*	54*	54*	42*	54*	50*	37	51*	46*	34	43*	39*	27	37	33	23	32	29	19	28	25	17	25	22	14	22	20	12
100	B	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27	18	18	26	18	18	23	18	27	21
		7-20	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	35	36	36	31	36	34	28
			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	31	36	32	27	36	28	23	36	25	20	34	22	18
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	35*	40*	40*	30
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	34*	40*	39*	28	40*	34*	24	40*	30	20	40*	27	18
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	44*	47*	47*	38*
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	43*	49*	49*	36*	47*	43*	31	42*	37*	26	37*	33*	23
	C	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27	18	18	25	18	27	22
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	27	18	18	24	18	27	21	18	26	18	27	23	16	27	20	14
		7-20	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	33	36	35	29	36	30	25	36	27	22	36	24	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	30	25	36	26	22	35	23	19	30	20	16	27	17	14	24	15	13
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	31	40*	36*	26	40*	32	22	40*	28	19
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	33	40*	37*	26	40*	32	22	40*	27	19	40*	24	16	36*	21	14	32	19	13
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	47*	47*	39*	46*	46*	34*	44*	40*	29	40*	36*	25
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	46*	49*	49*	41*	49*	46*	34*	44*	40*	28	38*	34*	24	33*	30	20	29	26	17	26	23	15
	D	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30	20	20	27	20	20	24	20	29	21	20	26	19
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30	20	20	28	20	20	24	20	29	20	20	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	33	28	36	29	24	36	25	21	34	22	18	30	20	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	33	27	36	30	25	36	26	21	33	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		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*	36	44*	40*	30	44*	35	25	44*	31	21	44*	27	18	41*	24	16
			Exposed	44*	44*	44*	44*	44*	44*	44*	44*	43*	44*	44*	37	44*	44*	33	44*	40*	29	44*	36	26	44*	31	21	44*	26	18	39*	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	46*	50*	50*	38*	48*	44*	32	43*	38*	27	38*	34	23	33	30	20
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	42*	51*	50*	37*	51*	46*	34	43*	39*	27	37*	33	23	32	29	19	28	25	17	25	22	14	22	20	12

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	98	98	98	94	98	98	89	98	98	86	98	95	82	98	88	76	95	82	69	89	77	60	84	72	52	79	66	46	75	58	41
			Exposed	98	98	89	98	98	85	98	93	81	98	89	77	98	85	73	94	82	68	90	79	63	84	73	53	79	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	98	98	98	98	98	98	98	98	95	98	98	90	98	94	86	98	90	82	98	86	79	91	79	71	85	73	61	81	64	53	76	56	46	72	49	41	67	44	55
			Exposed	98	94	86	98	89	81	98	84	77	92	80	73	88	77	67	85	73	61	82	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	36
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	98	98	92	98	94	88	98	87	81	97	80	75	91	75	65	86	68	53	82	60	45	78	53	39
			Exposed	98	98	97	98	97	91	98	92	86	98	87	82	98	83	78	96	80	74	92	77	68	86	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	99	99	92	99	95	86	96	88	80	89	83	75	83	78	67	78	73	57	73	67	50
			Exposed	99	99	99	99	99	95	99	99	91	99	96	86	99	92	83	95	88	79	91	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	98	98	92	98	98	87	98	96	83	98	92	80	98	88	76	97	84	72	93	81	67	87	76	57	81	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	98	88	76	96	83	71	92	80	65	88	76	58	84	72	53	81	68	48	78	62	44	71	53	56	62	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	98	98	89	98	92	84	98	87	80	96	83	76	91	79	71	87	76	65	84	71	59	79	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	90	79	71	86	75	63	83	69	57	80	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	98	98	98	98	98	94	98	95	89	98	91	85	98	86	81	98	83	77	95	79	73	89	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	98	86	80	98	82	76	93	78	70	89	74	61	86	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	29	42	37	25
		27-45	Interior	99	99	99	99	99	99	99	99	94	99	99	89	99	95	85	99	91	82	95	87	79	87	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	99	95	85	98	90	81	92	85	77	88	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	30
	D	0-7	Interior	98	98	85	98	93	81	98	89	77	98	85	73	94	81	68	90	78	62	86	75	56	80	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	37
			Exposed	93	81	68	89	77	60	85	74	54	81	68	49	78	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	98	89	82	98	84	77	91	80	72	88	76	66	84	72	60	81	66	54	79	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	36	60	39	32
			Exposed	84	72	60	81	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	98	97	91	98	92	86	98	87	81	98	83	77	96	79	73	92	76	67	88	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	95	79	73	91	75	66	87	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	27	59	35	24	53	31	21
		27-45	Interior	99	99	96	99	99	91	99	96	86	99	91	82	95	87	79	90	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	95	87	79	89	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	28	43	39	25
10	B	0-7	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	82	87	87	76	87	82	69	87	77	60	84	72	52	79	66	46	75	58	41
			Exposed	87	87	87	87	87	85	87	87	81	87	87	77	87	85	73	87	82	68	87	79	63	84	73	53	79	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	87	87	82	87	86	79	87	79	71	85	73	61	81	64	53	76	56	46	72	49	41	67	44	55
			Exposed	87	87	86	87	87	81	87	84	77	87	80	73	87	77	67	85	73	61	82	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	36
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	92	95	94	88	95	87	81	95	80	75	91	75	65	86	68	53	82	60	45	78	53	39
			Exposed	95	95	95	95	95	91	95	92	86	95	87	82	95	83	78	95	80	74	92	77	68	86	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	98	98	92	98	95	86	96	88	80	89	83	75	83	78	67	78	73	57	73	67	50
			Exposed	98	98	98	98	98	95	98	98	91	98	96	86	98	92	83	95	88	79	91	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	87	87	87	87	87	87	87	87	83	87	87	80	87	87	76	87	84	72	87	81	67	87	76	57	81	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	87	87	76	87	83	71	87	80	65	87	76	58	84	72	53	81	68	48	78	62	44	71	53	56	62	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	87	87	87	87	87	84	87	87	80	87	83	76	87	79	71	87	76	65	84	71	59	79	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	87	79	71	86	75	63	83	69	57	80	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	95	95	95	95	95	94	95	95	89	95	91	85	95	86	81	95	83	77	95	79	73	89	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	95	86	80	95	82	76	93	78	70	89	74	61	86	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	29	42	37	25
		27-45	Interior	98	98	98	98	98	98	98	98	94	98	98	89	98	95	85	98	91	82	95	87	79	87	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	98	95	85	98	90	81	92	85	77	88	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	30
	D	0-7	Interior	87	87	85	87	87	81	87	87	77	87	85	73	87	81	68	87	78	62	86	75	56	80	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	37
			Exposed	93	81	68	89	77	60	85	74	54	81	68	49	78	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	87	87	76	87	83	71	87	80	65	87	76	58	84	72	53	81	68	48	78	62	44	71	53	56	62	45	48	54	39	42	47	51	37	41	45	32	55	40	29
			Exposed	84	72	60	81	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	96	96	91	96	92	86	96	87	81	96	83	77	96	79	73	92	76	67	88	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	95	79	73	91	75	66	87	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	27	59	35	24	53	31	21
		27-45	Interior	98	98	96	98	98	91	98	96	86	98	91	82	95	87	79	90	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	95	87	79	89	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	28	43	39	25
20	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	69	77	77	60	77	72	52	77	66	46	75	58	41
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	63	77	73	53	77	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	71	78	73	61	78	64	53	76	56	46	72	49	41	67	44	55
			Exposed	78	78	78	78	78	78	78	78	77	78	78	73	78	77	67	78	73	61	78	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	36
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	81	88	80	75	88	75	65	86	68	53	82	60	45	78	53	39
			Exposed	88	88	88	88	88	88	88	88	86	88	87	82	88	83	78	88	80	74	88	77	68	86	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	86	91	88	80	89	83	75	83	78	67	78	73	57	73	67	50
			Exposed	91	91	91	91	91	91	91	91	91	91	91	86	91	91	83	91	88	79	91	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	72	77	77	67	77	76	57	77	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	77	77	76	77	77	71	77	77	65	77	76	58	77	72	53	77	68	48	77	62	44	71	53	56	62	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	76	78	78	71	78	76	65	78	71	59	78	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	78	78	71	78	75	63	78	69	57	78	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	85	88	86	81	88	83	77	88	79	73	88	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	88	86	80	88	82	76	88	78	70	88	74	61	86	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	29	42	37	25
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	89	91	91	85	91	91	82	91	87	79	87	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	91	91	85	91	90	81	91	85	77	88	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	30
	D	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	62	77	75	56	77	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	37
			Exposed	77	77	68	77	77	60	77	74	54	77	68	49	77	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	78	78	78	78	78	77	78	78	72	78	76	66	78	72	60	78	66	54	78	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	36	60	39	32
			Exposed	78	72	60	78	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	89	89	89	89	89	86	89	87	81	89	83	77	89	79	73	89	76	67	88	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	89	79	73	89	75	66	87	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	27	59	35	24	53	31	21
		27-45	Interior	93	93	93	93	93	91	93	93	86	93	91	82	93	87	79	90	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	93	87	79	89	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	28	43	39	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	69	77	77	60	77	72	52	77	66	46	75	58	41
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	63	77	73	53	77	64	45	73	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	71	78	73	61	78	64	53	76	56	46	72	49	41	67	44	55
			Exposed	78	78	78	78	78	78	78	78	77	78	78	73	78	77	67	78	73	61	78	67	55	77	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	~~36~~
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	80	75	83	75	65	83	68	53	82	60	45	78	53	39
			Exposed	83	83	83	83	83	83	83	83	83	83	83	82	83	83	78	83	80	74	83	77	68	83	68	54	81	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	83	75	83	78	67	78	73	57	73	67	50
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	86	79	86	84	76	84	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	72	77	77	67	77	76	57	77	68	49	76	60	42	70	52	56	63	46	49	56	41	44
			Exposed	77	77	76	77	77	71	77	77	65	77	76	58	77	72	53	77	68	48	77	62	44	71	53	56	62	45	48	54	39	42	47	51	~~37~~	41	45	~~32~~	55	40	~~29~~
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	76	78	78	71	78	76	65	78	71	59	78	61	50	74	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	78	78	71	78	75	63	78	69	57	78	62	51	77	56	47	74	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	~~32~~	52	~~34~~	~~29~~	47	~~31~~	~~25~~
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	83	77	83	79	73	83	72	59	83	63	49	79	54	40	75	48	34	69	42	45	63	37	38
			Exposed	83	83	80	83	82	76	83	78	70	83	74	61	83	68	54	83	62	48	80	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	~~29~~	42	~~37~~	~~25~~
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	86	86	82	86	86	79	86	81	72	80	75	61	75	68	51	67	60	44	59	52	38	52	47	52
			Exposed	86	86	85	86	86	81	86	85	77	86	82	73	84	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	~~30~~
	D	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	68	77	77	62	77	75	56	77	67	48	75	58	41	68	50	53	60	44	47	53	58	41	47	52	~~37~~
			Exposed	77	77	68	77	77	60	77	74	54	77	68	49	77	63	44	75	57	40	70	52	56	61	44	47	52	57	40	45	49	~~35~~	39	43	~~31~~	52	~~38~~	~~27~~	46	~~34~~	~~24~~
		7-20	Interior	78	78	78	78	78	77	78	78	72	78	76	66	78	72	60	78	66	54	78	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	~~36~~	60	39	~~32~~
			Exposed	78	72	60	78	64	53	77	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	~~36~~	57	37	~~31~~	50	~~33~~	~~27~~	44	~~29~~	~~24~~	~~39~~	~~26~~	~~21~~
		20-27	Interior	84	84	84	84	84	84	84	84	81	84	83	77	84	79	73	84	76	67	84	72	59	83	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	84	79	73	84	75	66	84	69	56	83	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	~~27~~	59	~~35~~	~~24~~	53	~~31~~	~~21~~
		27-45	Interior	88	88	88	88	88	88	88	88	86	88	88	82	88	87	79	88	84	76	86	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	88	87	79	88	83	75	85	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	~~28~~	43	39	~~25~~
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	60	71	71	52	71	66	46	71	58	41
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	63	71	71	53	71	64	45	71	56	39	67	49	52	59	43	46	52	57	41
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	61	73	64	53	73	56	46	72	49	41	67	44	55
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	67	73	73	61	73	67	55	73	57	47	71	49	40	64	42	52	56	55	46	49	49	40	44	43	~~36~~
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	75	65	78	68	53	78	60	45	78	53	39
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	68	54	78	59	44	77	51	37	72	44	31	67	39	40	59	52	36
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	75	81	78	67	78	73	57	73	67	50
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	79	81	81	76	81	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	57	71	68	49	71	60	42	70	52	56	63	46	49	56	41	44
			Exposed	71	71	71	71	71	71	71	71	65	71	71	58	71	71	53	71	68	48	71	62	44	71	53	56	62	45	48	54	39	42	47	51	~~37~~	41	45	~~32~~	55	40	~~29~~
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	65	73	71	59	73	61	50	73	52	43	68	45	37	60	39	49	53	52	43	47	47	39
			Exposed	73	73	71	73	73	63	73	69	57	73	62	51	73	56	47	73	51	42	70	47	39	61	40	50	52	51	43	45	45	37	59	39	~~32~~	52	~~34~~	~~29~~	47	~~31~~	~~25~~
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	73	78	72	59	78	63	49	78	54	40	75	48	34	69	42	45	63	37	38
			Exposed	78	78	78	78	78	76	78	78	70	78	74	61	78	68	54	78	62	48	78	57	43	75	48	34	69	41	44	61	54	37	53	47	32	47	42	~~29~~	42	~~37~~	~~25~~
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	79	81	81	76	81	78	68	78	72	56	71	63	47	62	56	40	55	49	35	48	43	47
			Exposed	81	81	81	81	81	81	81	81	77	81	81	73	81	78	68	80	75	60	77	70	54	68	60	44	58	52	37	50	45	48	44	39	40	38	52	35	52	46	~~30~~
	D	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	68	73	73	62	73	73	56	73	67	48	73	58	41	68	50	53	60	44	47	53	58	41	47	52	~~37~~
			Exposed	73	73	68	73	73	60	73	73	54	73	68	49	73	63	44	73	57	40	70	52	56	61	44	47	52	57	40	45	49	~~35~~	39	43	~~31~~	52	~~38~~	~~27~~	46	~~34~~	~~24~~
		7-20	Interior	75	75	75	75	75	75	75	75	72	75	75	66	75	72	60	75	66	54	75	60	50	73	51	42	67	44	54	58	38	47	50	50	41	44	44	~~36~~	60	39	~~32~~
			Exposed	75	72	60	75	64	53	75	58	48	74	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	~~36~~	57	37	~~31~~	50	~~33~~	~~27~~	44	~~29~~	~~24~~	~~39~~	~~26~~	~~21~~
		20-27	Interior	80	80	80	80	80	80	80	80	80	80	80	77	80	79	73	80	76	67	80	72	59	80	62	47	78	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	80	79	73	80	75	66	80	69	56	80	63	49	80	57	43	78	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	~~27~~	59	~~35~~	~~24~~	53	~~31~~	~~21~~
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	82	84	84	79	84	84	76	83	80	71	80	75	59	73	66	49	64	57	42	56	50	35	49	44	48	44	39	40
			Exposed	84	84	79	84	83	75	84	79	69	80	75	61	77	71	54	72	65	49	67	60	44	56	51	36	48	43	46	42	57	38	37	50	33	49	44	~~28~~	43	39	~~25~~
50	B	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	64	52	64	64	46	64	58	41
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	53	64	64	45	64	56	39	64	49	52	59	43	46	52	57	41
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	64	53	67	56	46	67	49	41	67	44	55
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	55	67	57	47	67	49	40	64	42	52	56	55	46	49	49	40	44	43	~~36~~
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	86	85	79	86	80	75	86	76	68
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	80	74	86	75	64	85	67	50	81	59	40	77	52	36
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	84	88	88	80	87	84	76
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	85	90	87	79	88	82	74	83	77	67	78	72	56	73	66	47
	C	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	57	64	64	49	64	60	42	64	52	56	63	46	49	56	41	44
			Exposed	64	64	64	64	64	64	64	64	64	64	64	58	64	64	53	64	64	48	64	62	44	64	53	56	62	45	48	54	39	42	47	51	~~37~~	41	45	~~32~~	55	40	~~29~~
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	59	67	61	50	67	52	43	67	45	37	60	39	49	53	52	43	47	47	39
			Exposed	67	67	67	67	67	63	67	67	57	67	62	51	67	56	47	67	51	42	67	47	39	61	40	50	52	51	43	45	45	37	59	39	~~32~~	52	~~34~~	~~29~~	47	~~31~~	~~25~~
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	82	77	86	77	69	86	71	56	83	63	45	80	56	39
			Exposed	86	86	86	86	86	86	86	86	86	86	86	84	86	85	80	86	82	76	86	79	72	86	72	57	83	62	44	78	54	37	74	47	32	69	42	~~29~~	63	~~37~~	~~25~~
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	88	89	89	82	87	85	77	85	80	71	80	76	62	76	70	52
			Exposed	90	90	90	90	90	90	90	90	90	90	90	88	90	90	85	90	90	81	90	86	78	86	80	71	80	75	60	74	67	49	66	59	40	58	52	35	52	46	~~30~~
	D	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	56	67	67	48	67	58	41	67	50	53	60	44	47	53	58	41	47	52	~~37~~
			Exposed	67	67	67	67	67	60	67	67	54	67	67	49	67	63	44	67	57	40	67	52	56	61	44	47	52	57	40	45	49	~~35~~	39	43	~~31~~	52	~~38~~	~~27~~	46	~~34~~	~~24~~
		7-20	Interior	70	70	70	70	70	70	70	70	70	70	70	66	70	70	60	70	66	54	70	60	50	70	51	42	67	44	54	58	38	47	50	50	41	44	44	~~36~~	60	39	~~32~~
			Exposed	70	70	60	70	64	53	70	58	48	70	52	43	70	47	39	66	43	54	60	39	49	51	50	42	44	43	~~36~~	57	37	~~31~~	50	~~33~~	~~27~~	44	~~29~~	~~24~~	~~39~~	~~26~~	~~21~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	76	67	77	72	59	77	62	47	77	53	39	73	46	32	67	40	41	60	53	36	53	47	32
			Exposed	77	77	73	77	75	66	77	69	56	77	63	49	77	57	43	77	52	38	75	48	34	68	40	42	59	52	36	51	45	31	45	40	~~27~~	59	~~35~~	~~24~~	53	~~31~~	~~21~~
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	92	87	91	90	81	89	84	76	84	78	69	79	74	58	74	67	48	67	59	40
			Exposed	92	92	92	92	92	90	92	92	86	92	91	82	92	87	78	90	83	75	86	80	71	79	74	58	73	66	46	63	57	38	55	50	33	49	44	~~28~~	43	39	~~25~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	46	58	58	41
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	45	58	56	39	58	49	52	58	43	46	52	57	41
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	80	78	70	80	73	62	80	67	55
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78	80	79	70	80	72	61	80	63	52	76	55	46	71	49	40	66	43	36
		20-27	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	80	75	82	76	68
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	80	74	82	75	64	82	67	50	81	59	40	77	52	36
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	85	85	80	84	84	76
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	86	79	86	82	74	83	77	67	78	72	56	73	66	47
	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	57	58	58	49	58	58	42	58	52	56	58	46	49	56	41	44
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	48	58	58	44	58	53	56	58	45	48	54	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	75	80	76	65	80	68	56	78	59	49	74	52	43	69	47	39
			Exposed	80	80	80	80	80	80	80	80	79	80	80	75	80	79	70	80	75	64	80	70	59	78	60	50	73	51	43	67	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	77	69	82	71	56	82	63	45	80	56	39
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	76	82	79	72	82	72	57	82	62	44	78	54	37	74	47	32	69	42	29	63	37	25
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	82	84	84	77	83	80	71	80	76	62	76	70	52
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	85	86	86	81	86	86	78	86	80	71	80	75	60	74	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	48	62	58	41	62	50	53	60	44	47	53	58	41	47	52	37
			Exposed	62	62	62	62	62	60	62	62	54	62	62	49	62	62	44	62	57	40	62	52	56	61	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	64	54	64	60	50	64	51	42	64	44	54	58	38	47	50	50	41	44	44	36	60	39	32
			Exposed	64	64	60	64	64	53	64	58	48	64	52	43	64	47	39	64	43	54	60	39	49	51	50	42	44	43	36	57	37	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	84	81	76	84	76	67	84	69	52	82	60	41	78	53	36	74	47	32
			Exposed	84	84	84	84	84	84	84	84	81	84	82	77	84	79	72	84	76	67	84	71	57	82	61	42	77	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	87	87	81	86	83	76	84	78	68	79	73	57	74	67	48	66	59	40
			Exposed	89	89	89	89	89	89	89	89	86	89	89	82	89	86	78	89	83	75	86	80	71	79	74	58	72	65	46	63	57	38	55	50	33	49	44	28	43	39	25
70	B	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	50	41
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	39	50	49	52	50	43	46	50	57	41
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	73	62	73	67	55
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	72	61	73	63	52	73	55	46	71	49	40	66	43	36
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	76	68
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	74	79	75	64	79	67	50	79	59	40	77	52	36
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	80	74	80	77	67	78	72	56	73	66	47
	C	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	42	50	50	56	50	46	49	50	41	44
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	44	50	50	56	50	45	48	50	39	42	47	51	37	41	45	32	55	40	29
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	65	73	68	56	73	59	49	73	52	43	69	47	39
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	73	64	73	70	59	73	60	50	73	51	43	67	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	77	69	79	71	56	79	63	45	78	56	39
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	79	72	79	72	57	79	62	44	78	54	37	74	47	32	69	42	29	63	37	25
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	80	71	79	76	62	76	70	52
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78	80	80	71	80	75	60	74	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	41	55	50	53	55	44	47	53	58	41	47	52	37
			Exposed	55	55	55	55	55	55	55	55	54	55	55	49	55	55	44	55	55	40	55	52	56	55	44	47	52	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	74	78	75	64	78	66	54	77	57	47	72	50	41	67	44	36	60	39	32
			Exposed	78	78	78	78	78	77	78	78	71	78	76	65	78	71	59	78	65	54	78	60	49	72	50	42	66	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76	81	76	67	81	69	52	80	60	41	78	53	36	74	47	32
			Exposed	81	81	81	81	81	81	81	81	81	81	77	81	79	72	81	76	67	81	71	57	81	61	42	77	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	83	83	76	81	78	68	79	73	57	74	67	48	66	59	40
			Exposed	84	84	84	84	84	84	84	84	84	84	82	84	84	78	84	83	75	84	80	71	79	74	58	72	65	46	63	57	38	55	50	33	49	44	28	43	39	25
80	B	0-7	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	41
			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	39	44	44	52	44	43	46	44	57	41
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	62	68	67	55
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	63	52	68	55	46	68	49	40	66	43	36
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	76	68
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	75	64	77	75	64	77	67	50	77	59	40	77	52	36
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	67	75	72	56	73	66	47						
	C	0-7	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	42	44	44	56	44	44	49	44	41	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	56	44	44	48	44	39	42	44	51	37	41	45	32	55	40	29
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	68	56	68	59	49	68	52	43	68	47	39
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	68	59	68	60	50	68	51	43	67	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	71	56	77	63	45	77	56	39
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	72	77	72	57	77	62	44	77	54	37	74	47	32	69	42	29	63	37	25
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	75	62	75	70	52
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	75	60	74	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	48	49	49	41	49	49	53	49	44	47	49	58	41	47	52	37
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	40	49	49	56	49	44	47	49	57	40	45	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	64	72	66	54	72	57	47	72	50	41	67	44	36	60	39	32
			Exposed	72	72	72	72	72	72	72	72	71	72	72	65	72	71	59	72	65	54	72	60	49	72	50	42	66	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	76	67	78	69	52	78	60	41	77	53	36	74	47	32
			Exposed	78	78	78	78	78	78	78	78	78	78	77	78	78	72	78	76	67	78	71	57	78	61	42	77	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	79	69	78	74	58	74	67	48	67	59	40
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	79	71	79	74	59	73	66	47	63	57	38	55	50	33	49	44	28	43	39	25	

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	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
			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	52	39	39	46	39	57	41
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	55
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	63	52	65	55	46	65	49	40	65	43	36
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	68
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	64	73*	67	50	73*	59	40	73*	52	36
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	67	71*	71*	56	71*	66	47
	C	0-7	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	56	39	39	49	39	39	44
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	56	39	39	48	39	39	42	39	51	37	39	45	32	55	40	29
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	56	65	59	49	65	52	43	65	47	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	59	65	60	50	65	51	43	65	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	69	73*	71	56	73*	63	45	73*	56	39
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72*	73*	72*	57	73*	62	44	73*	54	37	73*	47	32	69	42	29	63	37	25
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	62	71*	70*	52
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	60	71*	67	49	66	59	40	58	52	35	52	46	30
	D	0-7	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	41	44	44	53	44	44	47	44	58	41	44	52	37
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	56	44	44	47	44	57	40	44	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	66	54	68	57	47	68	50	41	67	44	36	60	39	32
			Exposed	68	68	68	68	68	68	68	68	68	68	68	65	68	68	59	68	65	54	68	60	49	68	50	42	66	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	67	75	69	52	75	60	41	75	53	36	74	47	32
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	67	75	71	57	75	61	42	75	52	36	72	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	73	57	74	67	48	66	59	40
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	74	58	72	65	46	63	57	38	55	50	33	49	44	28	43	39	25
100	B	0-7	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
			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	52	36	36	46	36	54	41
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	55
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	63	52	65	55	46	65	49	40	65	43	36
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	64	70*	67*	50	70*	59	40	70*	52	36
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	56	68*	66*	47
	C	0-7	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	54	36	36	49	36	36	44
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	54	36	36	48	36	36	42	36	51	37	36	45	32	54	40	29
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	56	65	59	49	65	52	43	65	47	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	59	65	60	50	65	51	43	65	45	37	59	39	32	52	34	29	47	31	25
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	56	70*	63	45	70*	56	39
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	57	70*	62	44	70*	54	37	70*	47	32	69*	42	29	63	37	25
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	62	68*	68*	52
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	60	68*	68*	49	66*	59	40	58	52	35	52	46	30
	D	0-7	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	53	39	39	47	39	58	41	39	52	37
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	56	39	39	47	39	57	40	39	49	35	39	43	31	52	38	27	46	34	24
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	54	65	57	47	65	50	41	65	44	36	60	39	32
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	54	65	60	49	65	50	42	65	43	36	57	38	31	50	33	27	44	29	24	39	26	21
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	69	52	73*	60	41	73*	53	36	73*	47	32
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72*	73*	73*	67	73*	71	57	73*	61	42	73*	52	36	72*	45	31	67	40	27	59	35	24	53	31	21
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	69*	71*	71*	57	71*	67	48	66	59	40
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	58	71*	65	46	63	57	38	55	50	33	49	44	28	43	39	25

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	83	83	83	83	83	83	83	83	79	83	83	76	83	83	72	83	80	68	83	77	61	82	71	47	77	62	39	72	50	34	66	42	29	54	37	26	46	32	23
			Exposed	83	83	72	83	79	67	83	76	57	83	72	49	80	68	42	77	61	38	74	53	35	66	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	83	83	83	83	83	80	83	83	77	83	79	73	83	76	68	82	73	61	79	68	52	75	53	40	68	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	83	76	68	81	71	58	78	66	48	75	56	41	71	47	37	68	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	81	84	82	77	84	79	74	84	76	70	83	69	56	79	56	42	74	44	35	69	38	29	61	33	25	53	30	21
			Exposed	84	82	77	84	78	73	84	75	68	84	70	58	81	65	49	78	55	41	76	47	37	69	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	78	84	82	75	82	77	68	77	71	55	72	63	44	64	51	37	50	42	32	41	37	27
			Exposed	84	84	81	84	84	77	84	81	74	83	78	69	80	75	63	77	70	54	74	67	47	65	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	83	83	75	83	81	70	83	78	64	83	75	55	82	71	47	79	67	41	76	59	38	69	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	82	70	47	78	65	40	75	56	36	70	48	33	66	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	83	78	71	83	75	66	80	70	54	77	63	45	74	53	40	70	45	36	67	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	74	53	40	69	43	35	64	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	84	84	80	84	80	76	84	77	71	84	73	66	83	69	56	80	62	47	78	53	40	72	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	83	68	55	80	60	45	76	50	38	73	42	33	69	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	84	84	83	84	84	79	84	83	76	84	80	72	82	77	68	79	74	60	76	70	52	69	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	82	77	68	78	73	58	75	68	49	70	60	42	65	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	83	79	67	83	76	58	83	72	49	79	67	42	76	60	38	73	52	35	69	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	76	59	38	72	50	34	67	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	82	72	59	78	67	48	75	55	41	71	46	37	67	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	67	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	84	78	74	84	75	68	84	70	58	81	64	48	78	54	41	75	46	36	72	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	78	53	41	74	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	84	84	77	84	81	74	83	78	69	80	74	62	76	70	53	73	66	45	69	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	76	70	52	72	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
10	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	74	61	74	71	47	74	62	39	72	50	34	66	42	29	54	37	26	46	32	23
			Exposed	74	74	72	74	74	67	74	74	57	74	72	49	74	68	42	74	61	38	74	53	35	66	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	73	74	74	68	74	73	61	74	68	52	74	53	40	68	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	74	74	68	74	71	58	74	66	48	74	56	41	71	47	37	68	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	79	74	81	76	70	81	69	56	79	56	42	74	44	35	69	38	29	61	33	25	53	30	21
			Exposed	81	81	77	81	78	73	81	75	68	81	70	58	81	65	49	78	55	41	76	47	37	69	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	83	78	83	82	75	82	77	68	77	71	55	72	63	44	64	51	37	50	42	32	41	37	27
			Exposed	83	83	81	83	83	77	83	81	74	83	78	69	80	75	63	77	70	54	74	67	47	65	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	74	74	74	74	74	70	74	74	64	74	74	55	74	71	47	74	67	41	74	59	38	69	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	74	70	47	74	65	40	74	56	36	70	48	33	66	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	74	74	71	74	74	66	74	70	54	74	63	45	74	53	40	70	45	36	67	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	74	53	40	69	43	35	64	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	81	81	80	81	80	76	81	77	71	81	73	66	81	69	56	80	62	47	78	53	40	72	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	81	68	55	80	60	45	76	50	38	73	42	33	69	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	83	83	83	83	83	79	83	83	76	83	80	72	82	77	68	79	74	60	76	70	52	69	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	82	77	68	78	73	58	75	68	49	70	60	42	65	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	74	74	67	74	74	58	74	72	49	74	67	42	74	60	38	73	52	35	69	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	74	59	38	72	50	34	67	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	74	72	59	74	67	48	74	55	41	71	46	37	67	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	67	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	82	78	74	82	75	68	82	70	58	81	64	48	78	54	41	75	46	36	72	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	78	53	41	74	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	84	84	77	84	81	74	83	78	69	80	74	62	76	70	53	73	66	45	69	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	76	70	52	72	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
20	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	47	62	62	39	62	50	34	62	42	29	54	37	26	46	32	23
			Exposed	62	62	62	62	62	62	62	62	57	62	62	49	62	62	42	62	61	38	62	53	35	62	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	52	62	53	40	62	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	62	62	62	62	62	58	62	62	48	62	56	41	62	47	37	62	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	70	75	69	56	75	56	42	74	44	35	69	38	29	61	33	25	53	30	21
			Exposed	75	75	75	75	75	73	75	75	68	75	70	58	75	65	49	75	55	41	75	47	37	69	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	77	68	77	71	55	72	63	44	64	51	37	50	42	32	41	37	27
			Exposed	78	78	78	78	78	77	78	78	74	78	78	69	78	75	63	77	70	54	74	67	47	65	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	59	38	62	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	62	62	47	62	62	40	62	56	36	62	48	33	62	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	62	62	62	62	62	62	62	62	54	62	62	45	62	53	40	62	45	36	62	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	62	53	40	62	43	35	62	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	75	75	75	75	75	75	75	75	71	75	73	66	75	69	56	75	62	47	75	53	40	72	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	75	68	55	75	60	45	75	50	38	73	42	33	69	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	78	78	78	78	78	78	78	78	76	78	78	72	78	77	68	78	74	60	76	70	52	69	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	78	77	68	78	73	58	75	68	49	70	60	42	65	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	62	62	62	62	62	58	62	62	49	62	62	42	62	60	38	62	52	35	62	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	62	59	38	62	50	34	62	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	62	62	59	62	62	48	62	55	41	62	46	37	62	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	62	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	76	76	74	76	75	68	76	70	58	76	64	48	76	54	41	75	46	36	72	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	76	53	41	74	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	79	79	77	79	79	74	79	78	69	79	74	62	76	70	53	73	66	45	69	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	76	70	52	72	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	47	61	61	39	61	50	34	61	42	29	54	37	26	46	32	23
			Exposed	61	61	61	61	61	61	61	61	57	61	61	49	61	61	42	61	61	38	61	53	35	61	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	52	62	53	40	62	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	62	62	62	62	62	58	62	62	48	62	56	41	62	47	37	62	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	56	68	56	42	68	44	35	68	38	29	61	33	25	53	30	21
			Exposed	68	68	68	68	68	68	68	68	68	68	68	58	68	65	49	68	55	41	68	47	37	68	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	68	74*	71	55	72	63	44	64	51	37	50	42	32	41	37	27
			Exposed	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	69	74*	74*	63	74*	70	54	74*	67	47	65	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	55	61	61	47	61	61	41	61	59	38	61	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	61	61	47	61	61	40	61	56	36	61	48	33	61	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	62	62	62	62	62	62	62	62	54	62	62	45	62	53	40	62	45	36	62	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	62	53	40	62	43	35	62	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	66	68	68	56	68	62	47	68	53	40	68	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	68	68	55	68	60	45	68	50	38	68	42	33	68	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	74*	72	74*	74*	68	74*	74*	60	74*	70	52	69	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	74*	74*	68	74*	73	58	74*	68	49	70	60	42	65	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	62	62	62	62	62	58	62	62	49	62	62	42	62	60	38	62	52	35	62	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	62	59	38	62	50	34	62	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	62	62	59	62	62	48	62	55	41	62	46	37	62	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	62	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	70	70	70	70	70	68	70	70	58	70	64	48	70	54	41	70	46	36	70	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	70	53	41	70	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	75	75	75	75	75	74	75	75	69	75	74	62	75	70	53	73	66	45	69	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	75	70	52	72	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
40	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	52	39	52	50	34	52	42	29	52	37	26	46	32	23
			Exposed	52	52	52	52	52	52	52	52	52	52	52	49	52	52	42	52	52	38	52	52	35	52	42	30	52	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	53	40	55	42	34	55	36	30	50	31	26	42	28	23	38	25	20
			Exposed	55	55	55	55	55	55	55	55	48	55	55	41	55	47	37	55	41	34	55	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	56	65*	56	42	65*	44	35	65*	38	29	61	33	25	53	30	21
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	58	65*	65*	49	65*	55	41	65*	47	37	65*	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	55	66*	63*	44	64*	51	37	50	42	32	41	37	27
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	63*	66*	66*	54	66*	66*	47	65*	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	52	41	52	52	38	52	46	32	52	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	52	52	47	52	52	40	52	52	36	52	48	33	52	42	30	52	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	55	55	55	55	55	55	55	55	54	55	55	45	55	53	40	55	45	36	55	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	55	53	40	55	43	35	55	39	32	55	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	56	65*	62*	47	65*	53	40	65*	41	32	65*	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	65*	65*	55	65*	60	45	65*	50	38	65*	42	33	65*	38	29	65*	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	61*	66*	66*	52	66*	58*	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	66*	66*	66*	66*	66*	59*	66*	66*	49	66*	60*	42	65*	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	55	55	55	55	55	55	55	55	49	55	55	42	55	55	38	55	52	35	55	46	32	55	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	55	55	38	55	50	34	55	43	30	55	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	59	59	59	59	59	48	59	55	41	59	46	37	59	41	33	59	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	59	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	65	65	65	65	65	65	65	65	58	65	64	48	65	54	41	65	46	36	65	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	65	53	41	65	44	35	65	39	30	65	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	62	69*	69*	53	69*	66*	45	68*	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	69*	69*	52	69*	64*	44	67*	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
50	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	39	42	42	34	42	42	29	42	37	26	42	32	23
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	35	42	42	30	42	36	25	42	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	40	46	42	34	46	36	30	46	31	26	42	28	23	38	25	20
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	37	46	41	34	46	38	31	46	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	56*	58*	56*	42	58*	44	35	58*	38	29	58*	33	25	53*	30	21
			Exposed	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	49	58*	55*	41	58*	47	37	58*	38	30	58*	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	55*	60*	60*	44	60*	51*	37	50*	42	32	41	37	27			
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	54*	60*	60*	47	60*	52*	37	49*	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	38	42	42	32	42	39	27	42	33	24	40	29	21	35	26	18	31	23	24
			Exposed	42	42	42	42	42	40	42	42	36	42	42	33	42	42	30	42	38	27	42	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	45	46	46	40	46	45	36	46	40	33	46	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	46	46	40	46	43	35	46	39	32	46	35	29	46	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	56*	58*	58*	47	58*	53*	40	58*	41	32	58*	35	26	55*	30	22	46	27	19	40	23	16	36	21	14
			Exposed	58*	58*	55*	58*	58*	45	58*	50	38	58*	42	33	58*	38	29	58*	35	26	58*	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	52*	60*	58*	41	55*	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	60*	60*	60*	60*	60*	58*	60*	60*	49*	60*	60*	42	60*	51*	37	54*	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	42	47	47	38	47	47	35	47	46	32	47	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	47	47	38	47	47	34	47	43	30	47	39	27	47	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	50	50	50	50	50	48	50	50	41	50	46	37	50	41	33	50	37	30	50	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	50	40	33	50	36	30	50	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	61*	61*	61*	61*	61*	61*	61*	61*	58*	61*	61*	48	61*	54	41	61*	46	36	61*	41	32	61*	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	61*	53	41	61*	44	35	61*	39	30	61*	35	27	58*	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	53*	62*	62*	45	62*	57*	40	54*	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	62*	62*	53*	62*	62*	44	62*	54*	38	56*	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	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	34	35	35	29	35	35	26	35	32	23
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	35	25	35	31	22	35	27	19	33	24	17	29	21	23
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	30	38	31	26	38	28	23	38	25	20
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	34	38	38	31	38	32	26	38	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	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*	42	52*	44*	35	52*	38	29	52*	33	25	51*	30	21
			Exposed	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	49*	52*	52*	41	52*	47*	37	52*	38	30	52*	33	24	50*	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	44*	55*	51*	37	50*	42*	32	42*	37	27
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	54*	55*	55*	47*	55*	51*	37	49*	41*	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	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	32	35	35	27	35	33	24	35	29	21	35	26	18	31	23	24
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	35	27	35	35	25	35	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	33	38	34	28	38	29	24	38	25	21	34	22	18	30	19	24	26	17	22
			Exposed	38	38	38	38	38	35	38	38	32	38	35	29	38	32	26	38	29	24	38	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	47*	52*	52*	40	52*	41	32	52*	35	26	52*	30	22	46*	27	19	40	23	16	36	21	14
			Exposed	52*	52*	52*	52*	52*	45*	52*	50*	38	52*	42	33	52*	38	29	52*	35	26	52*	32	23	47*	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	52*	55*	55*	41*	54*	45*	34	43*	38	28	37	33	24	33	29	21	29	26	18
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	49*	55*	55*	42*	55*	51*	37	54*	44*	33	46*	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	35	39	39	32	39	38	27	39	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	39	39	38	39	39	34	39	39	30	39	39	27	39	35	25	39	32	23	39	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	43	43	43	43	43	43	43	43	41	43	43	37	43	41	33	43	37	30	43	34	28	43	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	43	40	33	43	36	30	43	32	27	43	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	48*	55*	54*	41	55*	46	36	55*	41	32	55*	34	26	53*	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	55*	53*	41	55*	44	35	55*	39	30	55*	35	27	55*	32	23	52*	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	53*	58*	58*	46*	58*	57*	40	53*	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	58*	58*	52*	58*	58*	44	58*	53*	38	56*	45*	34	47*	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
70	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	29	31	31	26	31	31	23
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	25	31	31	22	31	27	19	31	24	17	29	21	23
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	31	26	33	28	23	33	25	20
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	32	26	33	27	22	33	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	42*	45*	44*	35	45*	38*	29	45*	33	25	45*	30	21
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	41*	45*	45*	37	45*	38*	30	45*	33	24	45*	28	20	42*	25	17	37	22	15	33	19	20
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	44*	50*	50*	37*	48*	42*	32	41*	37*	27
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	37*	49*	41*	31	40*	36*	26	35	31	22	31	27	19	27	24	17
	C	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	27	31	31	24	31	29	21	31	26	18	31	23	24
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	27	31	31	25	31	29	21	31	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	29	24	33	25	21	33	22	18	30	19	24	26	17	22
			Exposed	33	33	33	33	33	33	33	33	32	33	33	29	33	32	26	33	29	24	33	26	22	33	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	40*	45*	41*	32	45*	35	26	45*	30	22	44*	27	19	40*	23	16	36	21	14
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	38*	45*	42*	33	45*	38*	29	45*	35	26	45*	32	23	45*	27	19	39*	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	49*	45*	34	43*	38*	28	37*	33	24	33	29	21	29	26	18
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	49*	51*	51*	42*	51*	51*	37*	51*	44*	33	46*	40*	30	38*	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	27	34	32	23	34	28	20	34	24	17	30	21	23	26	19	20
			Exposed	34	34	34	34	34	34	34	34	30	34	34	27	34	34	25	34	32	23	34	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	37	30	37	34	28	37	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	37	37	33	37	36	30	37	32	27	37	29	24	37	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	48*	49*	49*	41	49*	46*	36	49*	41	32	49*	34	26	49*	30	21	44*	26	18	38	22	15	34	20	20	30	17	18
			Exposed	49*	49*	41	49*	44*	35	49*	39	30	49*	35	27	49*	32	23	49*	29	21	46*	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	53*	54*	54*	45*	54*	54*	40*	52*	44*	33	41*	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	54*	54*	52*	54*	54*	44*	54*	53*	38	54*	45*	34	47*	40*	30	41*	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
80	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	27	27	23
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	22	27	27	19	27	24	17	27	21	23
		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	26	29	28	23	29	25	20
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26	29	27	22	29	23	19	29	21	17	28	18	23	25	24	20
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	35*	40*	38*	29	40*	33*	25	40*	30	21
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	38*	30	40*	33*	24	40*	28	20	40*	25	17	37*	22	15	33*	19	20
		27-45	Interior	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	44*	46*	46*	37*	44*	42*	32*	41*	37*	27
			Exposed	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	47*	48*	48*	37*	48*	41*	31	40*	36*	26	35*	31	22	31	27	19	27	24	17
	C	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	21	27	26	18	27	23	24
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	21	27	25	18	27	22	23	26	19	20	23	25	18	20	23	~~16~~
		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	28	29	29	24	29	25	21	29	22	18	29	19	24	26	17	22
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26	29	29	24	29	26	22	29	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	32	40*	35*	26	40*	30	22	40*	27	19	39*	23	16	36*	21	14
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	38*	40*	40*	33*	40*	38*	29	40*	35*	26	40*	32	23	40*	27	19	39*	23	16	34*	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	47*	47*	41*	45*	45*	34*	42*	38*	28	37*	33*	24	33*	29	21	29	26	18
			Exposed	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	42*	48*	48*	37*	48*	44*	33*	46*	40*	30	38*	34*	24	32*	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	28	20	30	24	17	30	21	23	26	19	20
			Exposed	30	30	30	30	30	30	30	30	30	30	30	27	30	30	25	30	30	23	30	29	21	30	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	29	24	32	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	32	32	32	32	32	30	32	32	27	32	29	24	32	26	22	32	24	20	32	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	41*	44*	44*	36	44*	41*	32	44*	34	26	44*	30	21	43*	26	18	38*	22	15	34	20	20	30	17	18
			Exposed	44*	44*	41*	44*	44*	35	44*	39*	30	44*	35	27	44*	32	23	44*	29	21	44*	27	19	39*	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	45*	50*	50*	40*	48*	44*	33	41*	37*	27	36*	32	23	31	28	20	28	25	17	24	22	15
			Exposed	50*	50*	50*	50*	50*	44*	50*	50*	38*	50*	45*	34	47*	40*	30	41*	37*	27	37*	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	24	17	24	21	23
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	25	20
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	22	26	23	19	26	21	17	26	18	23	25	24	20
		20-27	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*	29	35*	33*	25	35*	30*	21
			Exposed	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	30*	35*	33*	24	35*	28	20	35*	25	17	35*	22	15	33*	19	20
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	44*	44*	44*	42*	42*	37*	41*	41*	32*	39*	37*	27
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	37*	45*	41*	31*	40*	36*	26	35*	31*	22	31*	27	19	27	24	17
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	23	24
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	22	23	24	19	20	23	25	18	20	23	16
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	25	21	26	22	18	26	19	24	26	17	22
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	22	18	26	19	24	25	25	21	22	22	18	19	19	16	17	17	14
		20-27	Interior	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	32*	35*	35*	26	35*	30*	22	35*	27	19	35*	23	16	35*	21	14
			Exposed	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	33*	35*	35*	29	35*	35*	26	35*	32*	23	35*	27	19	35*	23	16	34*	20	21	30*	17	18	26	23	16	23	21	14
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	43*	43*	41*	41*	41*	34*	39*	38*	28	37*	33*	24	33*	29*	21	29*	26	18
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	42*	45*	45*	37*	45*	44*	33*	45*	40*	30*	38*	34*	24	32*	29*	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	20	27	24	17	27	21	23	26	19	20
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	25	17	27	21	23	25	18	20	22	24	17	19	21	15	17	19	13
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	24	29	24	20	29	21	17	28	18	23	25	25	20	22	22	18
			Exposed	29	29	29	29	29	29	29	29	27	29	29	24	29	26	22	29	24	20	29	22	18	29	19	23	24	24	20	21	21	17	18	18	15	25	16	13	22	14	12
		20-27	Interior	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	36*	39*	39*	32	39*	34*	26	39*	30	21	39*	26	18	38*	22	15	34*	20	20	30	17	18
			Exposed	39*	39*	39*	39*	39*	35*	39*	39*	30	39*	35*	27	39*	32	23	39*	29	21	39*	27	19	39*	23	15	33*	19	20	29	25	17	25	22	15	22	20	13	19	17	12
		27-45	Interior	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	45*	46*	46*	40*	44*	44*	33*	41*	37*	27	36*	32*	23	31*	28	20	28	25	17	24	22	15
			Exposed	48*	48*	48*	48*	48*	44*	48*	48*	38*	48*	45*	34*	47*	40*	30	41*	37*	27	37*	33*	24	32*	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	14
100	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	17	22	21	23
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	21	17	24	18	23	24	24	20
		20-27	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*	29*	32*	32*	25	32*	30*	21
			Exposed	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	30*	32*	32*	24	32*	28*	20	32*	25	17	32*	22	15	32*	19	20
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	48*	53*	53*	41*
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	47*	53*	53*	39*	53*	47*	34	46*	42*	29	41*	37	25
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	24
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	23	22	19	20	22	25	18	20	23	16
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	22	18	24	19	24	24	17	22
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	22	18	24	19	24	24	25	21	22	22	18	19	19	16	17	17	14
		20-27	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*	26	32*	30*	22	32*	27*	19	32*	23	16	32*	21	14
			Exposed	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	29*	32*	32*	26	32*	32*	23	32*	27*	19	32*	23	16	32*	20	21	30*	17	18	26	23	16	23	21	14
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	43*	53*	51*	37	50*	45*	31	44*	40*	27
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	50*	53*	53*	45*	53*	51*	37	49*	44*	31	42*	38	26	37	33	22	33	29	19	29	26	17
	D	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	23	24	24	20	24	24	17	24	21	23	24	19	20
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	17	24	21	23	24	18	20	22	24	17	19	21	15	17	19	13
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	24	20	26	21	17	26	18	23	25	25	20	22	22	18
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	22	26	24	20	26	22	18	26	19	23	24	24	20	21	21	17	18	18	15	25	16	13	22	14	12
		20-27	Interior	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	32*	35*	34*	26	35*	30*	21	35*	26	18	35*	22	15	34*	20	20	30*	17	18
			Exposed	35*	35*	35*	35*	35*	35*	35*	35*	30*	35*	35*	27	35*	32*	23	35*	29	21	35*	27	19	35*	23	15	33*	19	20	29	25	17	25	22	15	22	20	13	19	17	12
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	44*	44*	44*	43*	43*	40*	41*	41*	33*	39*	37*	27	36*	32*	23	31*	28	20	28	25	17	24	22	15
			Exposed	45*	45*	45*	45*	45*	44*	45*	45*	38*	45*	45*	34*	45*	40*	30*	41*	37*	27	37*	33*	24	32*	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	14

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	96	98	98	92	98	98	87	98	97	84	98	93	80	98	86	74	93	80	66	87	76	57	82	69	49	77	62	44	73	55	39
			Exposed	98	98	87	98	96	83	98	91	79	98	87	75	96	83	70	92	80	65	89	77	59	82	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	99	99	99	99	99	99	99	99	93	99	97	88	99	92	84	99	88	80	98	84	77	89	78	68	84	70	58	79	60	50	75	53	44	69	47	39	63	41	34
			Exposed	99	92	84	99	87	79	95	82	75	90	78	69	86	75	63	83	69	57	80	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	96	90	99	92	86	99	85	79	95	79	71	89	72	59	84	64	49	80	56	42	76	50	36
			Exposed	99	99	94	99	95	89	99	90	84	99	85	80	99	82	76	94	78	70	91	75	63	85	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99	100	100	95	100	100	91	100	93	84	94	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	100	100	99	100	100	93	100	99	89	100	94	85	98	90	81	93	86	77	89	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	98	98	90	98	98	86	98	94	81	98	90	78	98	86	74	95	83	69	92	79	63	85	73	54	79	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	98	86	74	94	82	68	90	78	61	86	75	55	82	69	50	79	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	99	96	87	99	90	82	99	85	78	93	81	74	89	77	68	86	74	61	83	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	89	77	67	85	72	60	81	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	99	99	98	99	99	92	99	93	87	99	89	82	99	84	78	98	81	75	93	77	69	87	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	99	84	78	96	80	74	92	76	67	88	70	56	84	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	100	100	100	100	100	97	100	100	92	100	97	87	100	93	84	97	89	80	92	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	100	93	83	96	88	79	90	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	98	96	83	98	91	79	98	87	75	96	83	70	92	80	64	88	76	58	85	73	53	79	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	92	79	64	87	76	57	83	71	51	79	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	99	87	80	95	82	75	90	78	69	86	74	62	83	68	56	80	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	83	68	56	79	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	99	95	89	99	90	84	99	85	79	98	81	75	94	78	70	90	74	61	87	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	93	77	69	89	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	100	100	94	100	99	89	100	94	84	98	89	81	93	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	93	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
10	B	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	88	84	88	88	80	88	86	74	88	80	66	87	76	57	82	69	49	77	62	44	73	55	39
			Exposed	88	88	87	88	88	83	88	88	79	88	87	75	88	83	70	88	80	65	88	77	59	82	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	88	80	88	84	77	88	78	68	84	70	58	79	60	50	75	53	44	69	47	39	63	41	34
			Exposed	88	88	84	88	87	79	88	82	75	88	78	69	86	75	63	83	69	57	80	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	96	96	90	96	92	86	96	85	79	95	79	71	89	72	59	84	64	49	80	56	42	76	50	36
			Exposed	96	96	94	96	95	89	96	90	84	96	85	80	96	82	76	94	78	70	91	75	63	85	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	91	99	93	84	94	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	99	99	99	99	99	93	99	99	89	99	94	85	98	90	81	93	86	77	89	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	88	88	88	88	88	86	88	88	81	88	88	78	88	86	74	88	83	69	88	79	63	85	73	54	79	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	88	86	74	88	82	68	88	78	61	86	75	55	82	69	50	79	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	88	88	87	88	88	82	88	85	78	88	81	74	88	77	68	86	74	61	83	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	88	77	67	85	72	60	81	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	96	96	96	96	96	92	96	93	87	96	89	82	96	84	78	96	81	75	93	77	69	87	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	96	84	78	96	80	74	92	76	67	88	70	56	84	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	99	99	99	99	99	97	99	99	92	99	97	87	99	93	84	97	89	80	92	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	99	93	83	96	88	79	90	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	88	88	83	88	88	79	88	87	75	88	83	70	88	80	64	88	76	58	85	73	53	79	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	92	79	64	87	76	57	83	71	51	79	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	99	87	80	95	82	75	90	78	69	86	74	62	83	68	56	80	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	83	68	56	79	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	99	95	89	99	90	84	99	85	79	98	81	75	94	78	70	90	74	61	87	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	93	77	69	89	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	100	100	94	100	99	89	100	94	84	98	89	81	93	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	93	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
20	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	66	78	76	57	78	69	49	77	62	44	73	55	39
			Exposed	78	78	78	78	78	78	78	78	78	78	78	75	78	78	70	78	78	65	78	77	59	78	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	68	78	70	58	78	60	50	75	53	44	69	47	39	63	41	34
			Exposed	78	78	78	78	78	78	78	78	75	78	78	69	78	75	63	78	69	57	78	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	86	89	85	79	89	79	71	89	72	59	84	64	49	80	56	42	76	50	36
			Exposed	89	89	89	89	89	89	89	89	84	89	85	80	89	82	76	89	78	70	89	75	63	85	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	92	84	92	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	92	92	92	92	92	92	92	92	89	92	92	85	92	90	81	92	86	77	89	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	63	78	73	54	78	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	78	78	74	78	78	68	78	78	61	78	75	55	78	69	50	78	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	61	78	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	78	77	67	78	72	60	78	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	89	89	89	89	89	89	89	89	87	89	89	82	89	84	78	89	81	75	89	77	69	87	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	89	84	78	89	80	74	89	76	67	88	70	56	84	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	87	92	92	84	92	89	80	92	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	92	92	83	92	88	79	90	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	78	78	78	78	78	78	78	78	75	78	78	70	78	78	64	78	76	58	78	73	53	78	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	78	78	64	78	76	57	78	71	51	78	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	78	78	78	78	78	75	78	78	69	78	74	62	78	68	56	78	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	78	68	56	78	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	90	90	89	90	90	84	90	85	79	90	81	75	90	78	70	90	74	61	87	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	90	77	69	89	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	93	93	93	93	93	89	93	93	84	93	89	81	93	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	93	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	66	77	76	57	77	69	49	77	62	44	73	55	39
			Exposed	77	77	77	77	77	77	77	77	77	77	77	75	77	77	70	77	77	65	77	77	59	77	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	68	78	70	58	78	60	50	75	53	44	69	47	39	63	41	34
			Exposed	78	78	78	78	78	78	78	78	75	78	78	69	78	75	63	78	69	57	78	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	79	83	79	71	83	72	59	83	64	49	80	56	42	76	50	36
			Exposed	83	83	83	83	83	83	83	83	83	83	83	80	83	82	76	83	78	70	83	75	63	83	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	84	87	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	87	87	87	87	87	87	87	87	87	87	87	85	87	87	81	87	86	77	87	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	69	77	77	63	77	73	54	77	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	77	77	74	77	77	68	77	77	61	77	75	55	77	69	50	77	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	61	78	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	78	77	67	78	72	60	78	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	82	83	83	78	83	81	75	83	77	69	83	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	83	83	78	83	80	74	83	76	67	83	70	56	83	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	84	87	87	80	87	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	87	87	83	87	87	79	87	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	78	78	78	78	78	78	78	78	75	78	78	70	78	78	64	78	76	58	78	73	53	78	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	78	78	64	78	76	57	78	71	51	78	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	78	78	78	78	78	75	78	78	69	78	74	62	78	68	56	78	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	78	68	56	78	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	85	85	85	85	85	84	85	85	79	85	81	75	85	78	70	85	74	61	85	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	85	77	69	85	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	88	88	88	88	88	88	88	88	84	88	88	81	88	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	88	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	57	71	69	49	71	62	44	71	55	39
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	65	71	71	59	71	70	50	71	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	70	58	74	60	50	74	53	44	69	47	39	63	41	34
			Exposed	74	74	74	74	74	74	74	74	74	74	74	69	74	74	63	74	69	57	74	63	52	74	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	71	79	72	59	79	64	49	79	56	42	76	50	36	76	50	36
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	78	70	79	75	63	79	64	50	79	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	78	82	81	72	81	76	62	76	70	53	70	62	46
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	83	77	83	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	63	71	71	54	71	65	46	71	56	40	67	49	35	59	43	31	53	38	41
			Exposed	71	71	71	71	71	68	71	71	61	71	71	55	71	69	50	71	64	45	71	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	74	61	74	68	56	74	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	74	74	67	74	72	60	74	65	54	74	59	48	74	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	77	69	79	69	55	79	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	79	79	78	79	79	74	79	76	67	79	70	56	79	64	50	79	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	83	77	82	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	83	83	83	83	83	79	83	83	75	83	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	70	74	74	64	74	74	58	74	73	53	74	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	74	74	64	74	74	57	74	71	51	74	65	46	74	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	76	76	76	76	76	75	76	76	69	76	74	62	76	68	56	76	62	51	76	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	76	68	56	76	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	81	81	81	81	81	81	81	81	79	81	81	75	81	78	70	81	74	61	81	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	81	77	69	81	72	59	81	66	51	81	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	85	85	85	85	85	85	85	85	84	85	85	81	85	85	77	84	82	73	83	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	85	85	77	85	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
50	B	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	57	65	65	49	65	62	44	65	55	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	50	65	61	43	65	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	58	67	60	50	67	53	44	67	47	39	63	41	34
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	57	67	63	52	67	53	44	67	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	72	59	75	64	49	75	56	42	75	50	36	75	50	36
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	75	63	75	64	50	75	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	72	77	76	62	76	70	53	70	62	46
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	54	65	65	46	65	56	40	65	49	35	59	43	31	53	38	41
			Exposed	65	65	65	65	65	65	65	65	61	65	65	55	65	65	50	65	64	45	65	59	42	65	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	56	67	57	47	67	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	67	67	67	67	67	60	67	65	54	67	59	48	67	53	44	67	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	69	55	75	59	45	75	51	37	73	45	31	67	40	27	60	35	24
			Exposed	75	75	75	75	75	74	75	75	67	75	70	56	75	64	50	75	58	44	75	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	77	77	77	77	77	77	77	77	75	77	77	70	77	76	63	77	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	68	58	68	68	53	68	64	45	68	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	68	68	64	68	68	57	68	68	51	68	65	46	68	59	42	68	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	71	71	71	71	71	71	71	71	69	71	71	62	71	68	56	71	62	51	71	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	71	68	56	71	61	50	71	54	45	71	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	75	77	77	70	77	74	61	77	69	54	77	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	77	77	69	77	72	59	77	66	51	77	59	45	77	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	81	73	80	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	81	81	77	81	81	72	81	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	57	59	59	49	59	59	44	59	55	39
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	50	59	59	43	59	52	37	59	46	32	55	40	29	49	36	38
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	60	50	62	53	44	62	47	39	62	41	34
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	62	52	62	53	44	62	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	71	73*	72*	59	73*	64	49	73*	56	42	73*	50	36
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	70	73*	73*	63	73*	64	50	73*	55	41	73*	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	62	71*	70*	53	70*	62	46
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	63	71*	69*	52	68*	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	46	59	56	40	59	49	35	59	43	31	53	38	41
			Exposed	59	59	59	59	59	59	59	59	59	59	59	55	59	59	50	59	59	45	59	59	42	59	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	56	62	57	47	62	49	41	62	42	35	57	37	31	50	33	41	44	29	36
			Exposed	62	62	62	62	62	60	62	62	54	62	59	48	62	53	44	62	48	40	62	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	69	73*	69	55	73*	59	45	73*	51	37	73*	45	31	67	40	27	60	35	24
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	70	56	73*	64	50	73*	58	44	73*	54	39	73*	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	69*	71*	71*	57	71*	64	48	63	56	41	55	50	35	49	44	30
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	63	71*	71*	56	71*	68*	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	62	53	62	62	45	62	54	39	62	47	33	56	41	29	50	36	39	44	32	35
			Exposed	62	62	62	62	62	57	62	62	51	62	62	46	62	59	42	62	54	38	62	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	62	51	65	57	47	65	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	65	65	56	65	61	50	65	54	45	65	49	41	65	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	70	74	74	61	74	69	54	74	58	43	74	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	74	74	69	74	72	59	74	66	51	74	59	45	74	54	40	74	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	68	74	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	74	74	74	74	74	72	74	74	66	74	73	57	74	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
70	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	44	51	51	39
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	43	51	51	37	51	46	32	51	40	29	49	36	38
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	56	53	44	56	47	39	56	41	34
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	52	56	53	44	56	46	38	56	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	59	67*	64*	49	67*	56	42	67*	50	36
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	63*	67*	64*	50	67*	55	41	67*	48	34	67*	42	29	63*	37	25	56	33	34
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	63*	66*	66*	53	66*	63*	46
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	64*	66*	66*	52	66*	60*	44	59*	52	37	51	46	32	46	41	28
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	49	35	51	43	31	51	38	41
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	45	51	51	42	51	50	35	51	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	47	56	49	41	56	42	35	56	37	31	50	33	41	44	29	36
			Exposed	56	56	56	56	56	56	56	56	54	56	56	48	56	53	44	56	48	40	56	44	37	56	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	55	67*	59	45	67*	51	37	68*	45	31	67*	40	27	60	35	24
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	56	67*	64*	50	67*	58	44	67*	54	39	67*	45	32	66*	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	57	66*	64*	48	63*	56	41	55	50	35	49	44	30
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	63*	66*	66*	56	66*	66*	50	66*	66*	50	63*	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	45	57	54	39	57	47	33	56	41	29	50	36	39	44	32	35
			Exposed	57	57	57	57	57	57	57	57	51	57	57	46	57	57	42	57	54	38	57	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	56	60	60	51	60	57	47	60	48	40	60	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	60	60	56	60	60	50	60	54	45	60	49	41	60	45	37	60	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	61	71*	69*	54	71*	58	43	71*	50	36	71*	43	30	64	38	26	56	33	23	50	29	31
			Exposed	71*	71*	69*	71*	71*	59	71*	66	51	71*	59	45	71*	54	40	71*	49	35	71*	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	68*	69*	69*	55	69*	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	66*	69*	69*	57	69*	68*	50	69*	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
80	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	39
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	37	45	45	32	45	40	29	45	36	38
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	47	39	49	41	34
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	46	38	49	40	33	49	35	29	47	31	38	41	41	34
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	59*	63*	63*	49	63*	56*	42	63*	50	36
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	50	63*	55*	41	63*	48	34	63*	42	29	63*	37	25	56*	33	34
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	53*	62*	62*	46
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	52	62*	62*	52	62*	60*	44	58*	53*	37	51	46	32	46	41	28
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	45	35	45	43	31	45	38	41
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	35	45	42	30	45	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	42	35	49	37	31	49	33	41	44	29	36
			Exposed	49	49	49	49	49	49	49	49	49	49	49	48	49	49	44	49	48	40	49	44	37	49	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	55*	63*	59*	45	63*	51	37	63*	45	31	62*	40	27	60*	35	24
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56*	63*	63*	50	63*	58*	44	63*	54	39	63*	45	32	63*	39	27	57*	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	57*	62*	62*	48	62*	56*	41	55*	50	35	49	44	30
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56*	62*	62*	50	62*	57*	41	54*	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	39	50	47	33	50	41	29	50	36	39	44	32	35
			Exposed	50	50	50	50	50	50	50	50	50	50	50	46	50	50	42	50	50	38	50	49	35	50	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	47	54	48	40	54	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	54	54	54	54	54	50	54	54	45	54	49	41	54	45	37	54	41	34	54	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	61*	66*	66*	54	66*	58	43	66*	50	36	65*	43	30	64*	38	26	56	33	23	50	29	31
			Exposed	66*	66*	66*	66*	66*	59	66*	66*	51	66*	59	45	66*	54	40	66*	49	35	66*	45	31	65*	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	55	65*	62*	46	60*	54	39	53	47	33	46	42	28	41	37	25
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	57	65*	65*	50	65*	62*	45	63*	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	32	40	40	29	40	36	38
		7-20	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	39	44	41	34
			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	38	44	40	33	44	35	29	44	31	38	41	41	34
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	49	59*	56*	42	59*	50*	36
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	50*	59*	55*	41	59*	48	34	59*	42	29	59*	37	25	56*	33	34
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	53*	59*	59*	46
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	52*	59*	59*	44	58*	52*	37	52*	46	32	46	41	28
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	31	40	38	41
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	37	39	40	32	34	39	28	30	34	38	27
		7-20	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	41	44	42	35	44	37	31	44	33	41	44	29	36
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	37	44	38	31	44	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	55*	59*	59*	45	59*	51*	37	59*	45	31	59*	40	27	58*	35	24
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	50*	59*	58*	44	59*	54*	39	59*	45	32	59*	39	27	57*	34	23	50*	29	31	44	39	27	39	35	24
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	48*	59*	56*	41	55*	50*	35	49*	44	30						
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	50*	59*	57*	41	54*	49*	34	47*	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	39	45	45	33	45	41	29	45	36	39	44	32	35
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	38	45	45	35	45	42	30	45	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	47	48	48	40	48	41	34	48	36	30	48	31	39	42	42	34	37	37	31
			Exposed	48	48	48	48	48	48	48	48	45	48	48	41	48	45	37	48	41	34	48	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	54	62*	58*	43	62*	50	36	62*	43	30	61*	38	26	56*	33	23	50	29	31
			Exposed	62*	62*	62*	62*	62*	59*	62*	62*	51	62*	59*	45	62*	54	40	62*	49	35	62*	45	31	62*	38	26	55*	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	62*	46	60*	54*	39	53*	47	33	46	42	28	41	37	25
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	57*	62*	62*	50	62*	61*	45	62*	56*	41	53*	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
100	B	0-7	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
			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	32	36	36	29	36	36	38
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	33	40	35	29	40	31	38	40	41	34
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	49*	54*	54*	42	54*	50*	36
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	41	54*	48*	34	54*	42	29	54*	37	25	54*	33	34
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	62	69*	69*	51	69*	62	43
	C	0-7	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	35	36	36	31	36	36	41
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	30	36	36	39	36	32	34	36	28	30	34	38	27
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	37	31	40	33	41	40	29	36
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	38	31	40	32	40	40	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	45*	54*	51*	37	54*	45*	31	54*	40	27	54*	35	24
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	44	54*	54*	39	54*	45*	32	54*	39	27	54*	34	23	50*	29	31	44	39	27	39	35	24
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	68*	69*	69*	57	69*	67*	48
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	68*	69*	69*	55	69*	64*	45	62	56	37	55	49	32	49	44	28
	D	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	33	40	40	29	40	36	39	40	32	35
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	35	40	40	30	40	36	38	40	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	41	34	44	36	30	44	31	39	42	42	34	37	37	31
			Exposed	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	41	34	44	37	31	44	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	54*	59*	58*	43	59*	50*	36	59*	43	30	59*	38	26	56*	33	23	50*	29	31
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	51*	59*	59*	45	59*	54*	40	59*	49	35	59*	45	31	59*	38	26	55*	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	55*	59*	59*	46	59*	54*	39	53*	47*	33	47*	42	28	41	37	25
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	57*	59*	59*	51*	59*	59*	45	59*	56*	41	53*	48*	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	78	78	78	78	78	78	78	78	76	78	78	72	78	78	67	78	77	59	78	73	51	78	66	39	73	52	33	67	42	28	55	35	25	45	31	22	38	27	19
			Exposed	78	78	67	78	76	57	78	71	48	78	67	41	76	58	35	73	51	32	69	45	29	56	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	78	78	78	78	78	78	78	78	74	78	77	69	78	73	61	78	68	51	77	61	43	69	45	34	59	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	78	73	60	78	67	48	75	56	40	70	47	34	66	39	31	58	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	76	70	79	72	66	79	62	47	75	47	35	69	37	29	61	32	24	51	28	21	44	25	18
			Exposed	79	79	75	79	75	69	79	70	60	79	65	49	78	54	41	75	46	35	71	40	31	61	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	79	71	79	73	59	75	66	46	67	53	36	53	42	31	42	35	26	35	31	23
			Exposed	79	79	78	79	79	74	79	78	69	79	75	62	77	70	52	74	66	45	69	56	39	54	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	78	78	70	78	78	64	78	75	54	78	70	46	78	65	39	75	57	34	72	49	32	62	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	78	65	39	75	54	34	70	46	30	65	40	27	55	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	78	76	67	78	70	55	78	64	45	73	53	38	69	44	33	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	69	44	33	62	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	79	79	77	79	77	73	79	74	67	79	69	56	79	61	46	77	52	39	74	45	34	67	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	79	61	46	76	50	37	72	41	32	68	35	28	61	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	79	79	79	79	79	76	79	79	72	79	77	67	79	73	59	76	69	50	73	64	44	63	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	79	73	59	76	68	48	71	59	41	66	50	35	54	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	78	76	58	78	71	48	78	67	41	76	58	35	72	50	32	68	43	29	61	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	72	50	32	67	42	28	58	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	78	67	49	75	56	40	70	46	34	65	39	31	57	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	57	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	79	75	69	79	70	60	79	64	49	77	53	40	74	45	34	70	38	30	66	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	74	45	34	69	37	29	63	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	79	79	74	79	78	69	79	74	61	77	70	52	73	64	44	69	55	38	62	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	73	64	44	67	53	37	57	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
10	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	59	67	67	51	67	66	39	67	52	33	67	42	28	55	35	25	45	31	22	38	27	19
			Exposed	67	67	67	67	67	57	67	67	48	67	67	41	67	58	35	67	51	32	67	45	29	56	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	68	51	68	61	43	68	45	34	59	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	68	68	60	68	67	48	68	56	40	68	47	34	66	39	31	58	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	76	70	77	72	66	77	62	47	75	47	35	69	37	29	61	32	24	51	28	21	44	25	18
			Exposed	77	77	75	77	75	69	77	70	60	77	65	49	77	54	41	75	46	35	71	40	31	61	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	78	71	78	73	59	75	66	46	67	53	36	53	42	31	42	35	26	35	31	23
			Exposed	78	78	78	78	78	74	78	78	69	78	75	62	77	70	52	74	66	45	69	56	39	54	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	67	67	67	67	67	64	67	67	54	67	67	46	67	65	39	67	57	34	67	49	32	62	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	67	65	39	67	54	34	67	46	30	65	40	27	55	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	68	68	67	68	68	55	68	64	45	68	53	38	68	44	33	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	68	44	33	62	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	77	77	77	77	77	73	77	74	67	77	69	56	77	61	46	77	52	39	74	45	34	67	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	77	61	46	76	50	37	72	41	32	68	35	28	61	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	78	78	78	78	78	76	78	78	72	78	77	67	78	73	59	76	69	50	73	64	44	63	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	78	73	59	76	68	48	71	59	41	66	50	35	54	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	67	67	58	67	67	48	67	67	41	67	58	35	67	50	32	67	43	29	61	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	67	50	32	67	42	28	58	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	68	67	49	68	56	40	68	46	34	65	39	31	57	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	57	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	77	75	69	77	70	60	77	64	49	77	53	40	74	45	34	70	38	30	66	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	74	45	34	69	37	29	63	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	79	79	74	79	78	69	79	74	61	77	70	52	73	64	44	69	55	38	62	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	73	64	44	67	53	37	57	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
20	B	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	39	54	52	33	54	42	28	54	35	25	45	31	22	38	27	19
			Exposed	54	54	54	54	54	54	54	54	48	54	54	41	54	54	35	54	51	32	54	45	29	54	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	43	54	45	34	54	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	54	54	54	54	54	48	54	54	40	54	47	34	54	39	31	54	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66	69	62	47	69	47	35	69	37	29	61	32	24	51	28	21	44	25	18
			Exposed	69	69	69	69	69	69	69	69	60	69	65	49	69	54	41	69	46	35	69	40	31	61	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	59	73	66	46	67	53	36	53	42	31	42	35	26	35	31	23
			Exposed	73	73	73	73	73	73	73	73	69	73	73	62	73	70	52	73	66	45	69	56	39	54	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	46	54	54	39	54	54	34	54	49	32	54	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	54	54	39	54	54	34	54	46	30	54	40	27	54	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	54	54	54	54	54	54	54	54	45	54	53	38	54	44	33	54	38	30	54	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	54	44	33	54	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	69	69	69	69	69	69	69	69	67	69	69	56	69	61	46	69	52	39	69	45	34	67	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	69	61	46	69	50	37	69	41	32	68	35	28	61	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	73	73	73	73	73	73	73	73	72	73	73	67	73	73	59	73	69	50	73	64	44	63	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	73	73	59	73	68	48	71	59	41	66	50	35	54	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	54	54	54	54	54	48	54	54	41	54	54	35	54	50	32	54	43	29	54	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	54	50	32	54	42	28	54	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	54	54	49	54	54	40	54	46	34	54	39	31	54	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	54	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	70	70	69	70	70	60	70	64	49	70	53	40	70	45	34	70	38	30	66	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	70	45	34	69	37	29	63	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	74	74	74	74	74	69	74	74	61	74	70	52	73	64	44	69	55	38	62	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	73	64	44	67	53	37	57	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	51	52	52	39	52	52	33	52	42	28	52	35	25	45	31	22	38	27	19
			Exposed	52	52	52	52	52	52	52	52	48	52	52	41	52	52	35	52	51	32	52	45	29	52	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	43	54	45	34	54	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	54	54	54	54	54	48	54	54	40	54	47	34	54	39	31	54	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	47	62	47	35	62	37	29	61	32	24	51	28	21	44	25	18
			Exposed	62	62	62	62	62	62	62	62	60	62	62	49	62	54	41	62	46	35	62	40	31	61	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	59	67*	66*	46	66*	53	36	53	42	31	42	35	26	35	31	23
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	62*	67*	67*	52	67*	66*	45	67*	56	39	54	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	46	52	52	39	52	52	34	52	49	32	52	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	52	52	39	52	52	34	52	46	30	52	40	27	52	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	54	54	54	54	54	54	54	54	45	54	53	38	54	44	33	54	38	30	54	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	54	44	33	54	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	62	62	62	62	62	62	62	62	62	62	62	56	62	61	46	62	52	39	62	45	34	62	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	62	61	46	62	50	37	62	41	32	62	35	28	61	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	59	67*	67*	50	67*	64*	44	63*	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	67*	67*	59	67*	67*	48	67*	59	41	66*	50	35	54	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	54	54	54	54	54	48	54	54	41	54	54	35	54	50	32	54	43	29	54	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	54	50	32	54	42	28	54	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	54	54	49	54	54	40	54	46	34	54	39	31	54	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	54	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	64	64	64	64	64	60	64	64	49	64	53	40	64	45	34	64	38	30	64	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	64	45	34	64	37	29	63	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	70*	70*	70*	70*	70*	69*	70*	70*	61	70*	70*	52	70*	64	44	69*	55	38	62	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	70*	64	44	68*	53	37	57	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
40	B	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	39	43	43	33	43	42	28	43	35	25	43	31	22	38	27	19
			Exposed	43	43	43	43	43	43	43	43	43	43	43	41	43	43	35	43	43	32	43	43	29	43	35	25	43	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	45	34	46	35	29	46	30	25	41	26	22	35	23	19	31	20	17
			Exposed	46	46	46	46	46	46	46	46	40	46	46	34	46	39	31	46	34	28	46	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	47	56*	47	35	56*	37	29	56*	32	24	51	28	21	44	25	18
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	49	56*	54*	41	56*	46	35	56*	40	31	56*	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	59*	60*	60*	46	60*	53*	36	53*	42	31	42	35	26	35	31	23
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	52*	60*	60*	45	60*	56*	39	54*	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	34	43	43	32	43	39	27	43	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	43	43	39	43	43	34	43	43	30	43	40	27	43	35	25	43	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	46	46	46	46	46	46	46	46	45	46	46	38	46	44	33	46	38	30	46	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	46	44	33	46	36	30	46	32	27	46	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	46	56*	52*	39	56*	45	34	56*	34	27	55*	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	56*	56*	46	56*	50	37	56*	41	32	56*	35	28	56*	32	25	54*	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	59*	60*	60*	51*	60*	60*	44	60*	49*	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	60*	60*	59*	60*	60*	49*	60*	59*	41	60*	50*	35	54*	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	46	46	46	46	46	46	46	46	41	46	46	35	46	46	32	46	43	29	46	38	26	46	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	46	46	32	46	42	28	46	36	25	46	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	49	49	49	49	49	40	49	46	34	49	39	31	49	34	28	49	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	49	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	62*	62*	62*	62*	62*	60*	62*	62*	49	62*	53	40	62*	45	34	62*	38	30	62*	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	62*	45	34	62*	37	29	62*	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	63*	63*	63*	63*	63*	63*	63*	63*	61*	63*	63*	52	63*	63*	44	63*	55*	38	62*	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	63*	63*	44	63*	54*	37	57*	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
50	B	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	33	35	35	28	35	35	25	35	31	22	35	27	19
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	29	35	35	25	35	30	21	35	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	35	29	38	30	25	38	26	22	35	23	19	31	20	17
			Exposed	38	38	38	38	38	38	38	38	38	38	38	34	38	38	31	38	34	28	38	31	26	38	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	49*	47*	35	49*	37	29	49*	32	24	49*	28	21	44*	25	18
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	41	49*	46*	35	49*	40	31	49*	32	25	49*	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	46*	54*	53*	36	53*	42*	31	42*	35	26	35	31	23
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	52*	54*	54*	45*	54*	54*	39	54*	43*	31	41*	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	32	35	35	27	35	32	23	35	28	20	33	24	17	29	21	23	26	19	20
			Exposed	35	35	35	35	35	34	35	35	30	35	35	27	35	35	25	35	32	22	35	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	33	38	38	30	38	34	28	38	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	38	38	33	38	36	30	38	32	27	38	29	24	38	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	46*	49*	49*	39	49*	45*	34	49*	34	27	49*	29	22	46*	25	18	39	22	15	33	20	13	30	17	18
			Exposed	49*	49*	46*	49*	49*	37	49*	41	32	49*	35	28	49*	32	25	49*	29	22	48*	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	44*	54*	48*	34	46*	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	54*	54*	54*	54*	54*	48*	54*	54*	41*	54*	50*	35	54*	43*	31	45*	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	39	29	39	38	26	39	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	39	39	32	39	39	28	39	36	25	39	32	23	39	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	42	42	42	42	42	40	42	42	34	42	39	31	42	34	28	42	31	25	42	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	42	34	28	42	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	49*	52*	52*	40	52*	45	34	52*	38	30	52*	34	27	52*	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	52*	45	34	52*	37	29	52*	33	25	52*	29	22	49*	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	57*	52*	57*	57*	44*	57*	55*	38	57*	48*	34	45*	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	57*	57*	44*	57*	53*	37	57*	45*	32	47*	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	30	22	30	27	19
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	25	30	30	21	30	26	18	30	23	24	27	20	21	24	18	19
		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	29	32	30	25	32	26	22	32	23	19	31	20	17
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	31	26	32	26	22	32	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	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*	35	43*	37*	29	43*	32	24	43*	28	21	43*	25	18
			Exposed	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	41*	43*	43*	35	43*	40*	31	43*	32	25	43*	27	20	42*	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	46*	49*	49*	36*	47*	42*	31	42*	35*	26	35*	31	23
			Exposed	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	45*	50*	50*	39*	50*	43*	31	41*	35*	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	28	20	30	24	17	29	21	23	26	19	20
			Exposed	30	30	30	30	30	30	30	30	30	30	27	30	30	25	30	30	22	30	29	21	30	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	28	23	32	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	32	32	32	32	32	30	32	32	27	32	29	24	32	26	22	32	24	20	32	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	39*	43*	43*	34	43*	34	27	43*	29	22	43*	25	18	39*	22	15	33	20	13	30	17	18
			Exposed	43*	43*	43*	43*	43*	37*	43*	41*	32	43*	35	28	43*	32	25	43*	29	22	43*	27	19	39*	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	44*	48*	48*	34	45*	38*	28	36*	32	24	31	28	20	27	25	17	24	22	15
			Exposed	50*	50*	50*	50*	50*	48*	50*	50*	41*	50*	50*	35*	50*	43*	31	45*	37*	28	39*	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	26	33	32	22	33	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	33	33	32	33	33	28	33	33	25	33	32	23	33	29	21	33	27	19	33	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	36	36	36	36	36	36	36	36	34	36	36	31	36	34	28	36	31	25	36	28	23	36	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	36	34	28	36	30	25	36	27	22	36	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	40*	46*	45*	34	46*	38	30	46*	34	27	46*	29	22	44*	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	46*	45*	34	46*	37	29	46*	33	25	46*	29	22	46*	27	20	43*	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	52*	53*	53*	44*	53*	53*	38*	52*	47*	34	45*	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	53*	53*	44*	53*	53*	37	53*	44*	32	47*	38*	28	39*	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
70	B	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	22	26	26	19
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	21	26	26	18	26	23	24	26	20	21	24	18	19
		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	28	28	28	28	28	28	28	25	28	26	22	28	23	19	28	20	17
			Exposed	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	26	22	28	23	19	28	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	35*	37*	37*	29	37*	32*	24	37*	28	21	37*	25	18
			Exposed	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	35*	37*	37*	31	37*	32*	25	37*	27	20	37*	24	17	35*	21	14	31	18	19	28	24	17
		27-45	Interior	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	44*	44*	36*	42*	42*	31*	40*	35*	26	35*	31*	23
			Exposed	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	45*	46*	46*	39*	46*	43*	31*	41*	34*	26	33*	30*	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	20	26	24	17	26	21	23	26	19	20
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	22	26	26	21	26	25	17	26	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		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	28	23	28	24	20	28	21	17	28	18	23	25	24	20	22	22	18
			Exposed	28	28	28	28	28	28	28	28	27	28	28	24	28	26	22	28	24	20	28	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	34*	37*	34*	27	37*	29	22	37*	25	18	37*	22	15	33*	20	13	30	17	18
			Exposed	37*	37*	37*	37*	37*	37*	37*	37*	32*	37*	35*	28	37*	32*	25	37*	29	22	37*	27	19	37*	22	16	33*	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	45*	45*	45*	44*	43*	43*	34*	41*	38*	28	36*	32*	24	31*	28	20	27	25	17	24	22	15
			Exposed	46*	46*	46*	46*	46*	46*	46*	46*	41*	46*	46*	35*	46*	43*	31*	45*	37*	28	39*	33*	25	32*	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	22	28	27	19	28	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	28	28	28	28	28	28	28	28	25	28	28	23	28	28	21	28	27	19	28	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	28	23	31	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	31	31	28	31	30	25	31	27	22	31	24	20	31	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	40*	41*	41*	34	41*	38*	30	41*	34	27	41*	29	22	41*	25	18	37*	21	15	32	19	19	28	16	17	25	22	15
			Exposed	41*	41*	34	41*	37*	29	41*	33	25	41*	29	22	41*	27	20	41*	24	17	39*	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	44*	48*	48*	38*	46*	46*	34*	44*	36*	27	35*	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	49*	49*	44*	49*	49*	37*	49*	44*	32	47*	38*	28	39*	34*	25	34*	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
80	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	24	22	20	21	22	18	19
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	20	17
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	20	24	24	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	29*	33*	32*	24	33*	28*	21	33*	25	18
			Exposed	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	31*	33*	32*	25	33*	27	20	33*	24	17	33*	21	14	31*	18	19	28*	24	17
		27-45	Interior	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	41*	41*	41*	40*	40*	36*	38*	38*	31*	37*	35*	27*	35*	31*	23
			Exposed	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	39*	42*	42*	31*	41*	34*	26	33*	30*	22	29*	26	18	26	23	16	23	20	21
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	17	22	21	23	22	19	20
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	17	22	21	23	22	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	21	17	24	18	23	24	24	20	22	22	18
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	27	33*	29*	22	33*	25	18	33*	22	15	32*	20	13	30*	17	18
			Exposed	33*	33*	33*	33*	33*	33*	33*	33*	32*	33*	33*	28*	33*	32*	25	33*	29*	22	33*	27	19	33*	22	16	33*	19	20	28*	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	41*	41*	41*	39*	39*	34*	37*	37*	28*	35*	32*	24	31*	28*	20	27*	25	17	24	22	15
			Exposed	42*	42*	42*	42*	42*	42*	42*	42*	41*	42*	42*	35*	42*	42*	31*	42*	37*	28*	39*	33*	25	31*	28*	20	27*	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	22	25	25	19	25	23	16	25	20	22	25	18	19	22	24	~~17~~
			Exposed	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	25	19	25	24	17	25	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	24	20	27	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	27	27	27	27	27	25	27	27	22	27	24	20	27	22	18	27	20	17	27	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	34*	36*	36*	30	36*	34*	27	36*	29	22	36*	25	18	36*	21	15	32*	19	19	28	16	17	25	22	15
			Exposed	36*	36*	34*	36*	36*	29	36*	33*	25	36*	29	22	36*	27	20	36*	24	17	36*	22	15	32*	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	44*	43*	43*	38*	42*	42*	34*	40*	36*	27	35*	31*	23	30*	27	19	26	23	16	23	21	21	20	18	18
			Exposed	45*	45*	44*	45*	45*	37*	45*	44*	32*	45*	38*	28	39*	33*	25	34*	31*	22	31*	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	24	20	20	21	20	18	19
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	20	17
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	20	24	22	17	21	22	23	19	20	20	~~17~~
		20-27	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	44*	50*	48*	37	50*	42*	31	50*	37	27
			Exposed	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	46*	50*	48*	37	50*	41*	31	50*	36	25	50*	31	21	47*	28	19	42*	24	17
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	46*	51*	51*	40*	49*	47*	34
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	39*	50*	45*	33	44*	39*	28	39*	35	24	34	31	21
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	20	23	20	19	20
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	20	23	20	18	19	20	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	21	17	22	18	23	22	24	20	22	22	18
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	19	23	22	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	41*	50*	44*	33	50*	38*	28	50*	34	23	49*	30	20	45*	26	18
			Exposed	50*	50*	50*	50*	50*	50*	50*	50*	48*	50*	50*	42*	50*	48*	37	50*	44*	33	50*	40*	29	50*	34	24	50*	29	20	43*	25	17	37	22	15	33	19	~~13~~	29	17	~~12~~
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	42*	50*	48*	36*	47*	42*	30	41*	37*	26	37*	33	23
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	42*	51*	50*	38*	47*	43*	31	41*	37*	26	35	32	22	31	28	18	27	24	16	24	22	~~14~~
	D	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	16	22	20	22	22	18	19	22	24	~~17~~
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	22	17	22	21	22	22	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	20	17	24	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	20	17	24	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	30*	33*	33*	27	33*	29*	22	33*	25	18	33*	21	15	32*	19	19	28*	16	17	25	22	15
			Exposed	33*	33*	33*	33*	33*	29*	33*	33*	25	33*	29*	22	33*	27	20	33*	24	17	33*	22	15	32*	19	19	28*	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	51*	54*	54*	41*	52*	47*	34	45*	41*	29	40*	35	25	35	31	21	31	28	18
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	48*	54*	54*	43*	54*	51*	38	52*	46*	34	47*	42*	31	40*	36	25	34	31	21	30	27	18	26	23	15	23	20	~~13~~	20	18	~~11~~
100	B	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	24	18	18	21	18	18	19
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	24	20	17	21	20	23	19	20	20	~~17~~
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	31	40*	37*	27
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	31	40*	36*	25	40*	31	21	40*	28	19	40*	24	17
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	46*	48*	48*	40*	46*	46*	35*
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	49*	49*	39*	49*	45*	33*	44*	39*	28	39*	35*	24	34*	31	21
	C	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	23	18	18	20
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	23	18	18	19	18	24	~~17~~	18	21	~~15~~	17	19	~~13~~
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	18	23	20	24	20	20	22	18
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	19	23	20	24	20	20	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	33	40*	38*	28	40*	34*	23	40*	30	20	40*	26	18
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	33	40*	40*	29	40*	34*	24	40*	29	20	40*	25	17	37*	22	15	33	19	~~13~~	29	17	~~12~~
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	48*	48*	42*	46*	46*	36*	44*	42*	30	41*	37*	26	37*	33*	23
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	49*	49*	42*	49*	49*	38*	47*	43*	31	41*	36*	26	35*	32*	22	31	28	18	27	24	16	24	22	~~14~~
	D	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	19	20	20	16	20	20	22	20	18	19	20	24	~~17~~
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	22	20	18	19	20	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	20	17	22	18	22	22	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	18	22	20	17	22	18	23	22	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	45*	50*	50*	40*	50*	43*	33	50*	37	27	50*	32	22	48*	28	19	42*	25	17	38*	22	15
			Exposed	50*	50*	50*	50*	50*	44*	50*	49*	38*	50*	44*	34	50*	40*	30	50*	37	26	50*	34	24	49*	28	19	42*	24	17	36	21	~~14~~	31	18	~~13~~	28	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	41*	49*	47*	34	45*	40*	29	39*	36*	25	35	31	21	31	28	18
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	48*	51*	51*	42*	51*	51*	38*	51*	46*	34	47*	42*	30	40*	36*	25	34	31	21	30	27	18	26	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	95	98	98	91	98	98	87	98	96	83	98	92	80	98	85	73	92	80	64	86	75	55	81	68	48	77	60	43	72	53	38
			Exposed	98	98	86	98	95	82	98	90	78	98	86	75	96	83	69	91	79	63	88	76	58	81	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	98	98	98	98	98	98	98	98	92	98	96	87	98	91	83	98	87	79	96	83	76	88	77	67	83	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	98	91	83	98	86	78	93	82	74	89	78	68	86	74	61	83	68	56	80	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	93	98	95	89	98	91	85	98	84	78	94	78	70	88	71	57	84	62	48	79	55	41	76	49	35
			Exposed	98	98	93	98	94	88	98	89	83	98	85	79	98	81	75	93	77	69	90	74	61	84	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	98	99	99	94	99	99	90	99	92	83	93	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	99	99	98	99	99	92	99	98	88	99	93	84	97	89	80	92	85	77	88	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	98	98	89	98	98	85	98	93	81	98	89	77	98	85	73	95	82	68	91	79	62	84	72	52	79	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	98	85	73	93	81	67	89	77	59	85	73	54	81	68	49	78	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	30	34	37	26
		7-20	Interior	98	95	86	98	89	81	98	84	77	92	80	72	88	77	66	85	72	60	82	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	88	76	66	84	71	58	81	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	98	98	97	98	98	91	98	92	86	98	88	82	98	84	78	97	80	74	92	77	68	86	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	98	83	77	95	79	72	91	75	64	87	69	55	84	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	99	99	99	99	99	96	99	99	91	99	96	87	99	92	83	96	88	79	91	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	99	92	83	95	87	78	89	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	98	95	82	98	90	78	98	86	74	95	82	69	91	79	62	87	76	57	84	72	52	78	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	91	79	62	86	75	56	82	70	50	79	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	98	86	79	94	82	74	89	77	68	85	73	61	82	67	55	79	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	82	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	98	94	88	98	89	83	98	84	79	97	80	75	93	77	68	89	73	59	86	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	92	77	68	88	71	57	85	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	99	99	93	99	98	88	99	93	84	97	89	80	92	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	91	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	22
10	B	0-7	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	83	87	87	80	87	85	73	87	80	64	86	75	55	81	68	48	77	60	43	72	53	38
			Exposed	87	87	86	87	87	82	87	87	78	87	86	75	87	83	69	87	79	63	87	76	58	81	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	83	87	87	79	87	83	76	87	77	67	83	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	87	87	83	87	86	78	87	82	74	87	78	68	86	74	61	83	68	56	80	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	89	95	91	85	95	84	78	94	78	70	88	71	57	84	62	48	79	55	41	76	49	35
			Exposed	95	95	93	95	94	88	95	89	83	95	85	79	95	81	75	93	77	69	90	74	61	84	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	94	98	98	90	98	92	83	93	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	98	98	98	98	98	92	98	98	88	98	93	84	97	89	80	92	85	77	88	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	87	87	87	87	87	85	87	87	81	87	87	77	87	85	73	87	82	68	87	79	62	84	72	52	79	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	87	85	73	87	81	67	87	77	59	85	73	54	81	68	49	78	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	30	34	37	26
		7-20	Interior	87	87	86	87	87	81	87	84	77	87	80	72	87	77	66	85	72	60	82	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	87	76	66	84	71	58	81	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	95	95	95	95	95	91	95	92	86	95	88	82	95	84	78	95	80	74	92	77	68	86	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	95	83	77	95	79	72	91	75	64	87	69	55	84	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	98	98	98	98	98	96	98	98	91	98	96	87	98	92	83	96	88	79	91	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	98	92	83	95	87	78	89	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	87	87	82	87	87	78	87	86	74	87	82	69	87	79	62	87	76	57	84	72	52	78	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	87	79	62	86	75	56	82	70	50	79	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	87	86	79	87	82	74	87	77	68	85	73	61	82	67	55	79	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	82	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	96	94	88	96	89	83	96	84	79	96	80	75	93	77	68	89	73	59	86	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	92	77	68	88	71	57	85	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	98	98	93	98	98	88	98	93	84	97	89	80	92	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	91	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	22
20	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	64	77	75	55	77	68	48	77	60	43	72	53	38
			Exposed	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	77	63	77	76	58	77	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	77	67	78	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	78	78	78	78	78	78	78	78	74	78	78	68	78	74	61	78	68	56	78	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	84	78	88	78	70	88	71	57	84	62	48	79	55	41	76	49	35
			Exposed	88	88	88	88	88	88	88	88	83	88	85	79	88	81	75	88	77	69	88	74	61	84	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	91	91	83	91	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	91	91	91	91	91	91	91	91	88	91	91	84	91	89	80	91	85	77	88	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	62	77	72	52	77	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	77	77	73	77	77	67	77	77	59	77	73	54	77	68	49	77	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	30	34	37	26
		7-20	Interior	78	78	78	78	78	78	78	78	77	78	78	72	78	77	66	78	72	60	78	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	78	76	66	78	71	58	78	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	88	88	88	88	88	88	88	88	86	88	88	82	88	84	78	88	80	74	88	77	68	86	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	88	83	77	88	79	72	88	75	64	87	69	55	84	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	87	91	91	83	91	88	79	91	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	91	91	83	91	87	78	89	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	77	77	77	77	77	77	77	77	74	77	77	69	77	77	62	77	76	57	77	72	52	77	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	77	77	62	77	75	56	77	70	50	77	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	78	78	78	78	78	74	78	77	68	78	73	61	78	67	55	78	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	78	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	89	89	88	89	89	83	89	84	79	89	80	75	89	77	68	89	73	59	86	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	89	77	68	88	71	57	85	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	93	93	93	93	93	88	93	93	84	93	89	80	92	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	91	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	22

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	64	77	75	55	77	68	48	77	60	43	72	53	38
			Exposed	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	77	63	77	76	58	77	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	77	67	78	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	78	78	78	78	78	78	78	78	74	78	78	68	78	74	61	78	68	56	78	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	78	83	78	70	83	71	57	83	62	48	79	55	41	76	49	35
			Exposed	83	83	83	83	83	83	83	83	83	83	83	79	83	81	75	83	77	69	83	74	61	83	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	86	86	86	86	86	86	86	86	86	86	86	84	86	86	80	86	85	77	86	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	62	77	72	52	77	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	77	77	73	77	77	67	77	77	59	77	73	54	77	68	49	77	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	78	78	78	78	78	78	78	78	77	78	78	72	78	77	66	78	72	60	78	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	78	76	66	78	71	58	78	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	82	83	83	78	83	80	74	83	77	68	83	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	83	83	77	83	79	72	83	75	64	83	69	55	83	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	86	79	86	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	86	86	83	86	86	78	86	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	77	77	77	77	77	77	77	77	74	77	77	69	77	77	62	77	76	57	77	72	52	77	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	77	77	62	77	75	56	77	70	50	77	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	78	78	78	78	78	74	78	77	68	78	73	61	78	67	55	78	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	78	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	84	84	84	84	84	83	84	84	79	84	80	75	84	77	68	84	73	59	84	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	84	77	68	84	71	57	84	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	88	88	88	88	88	88	88	88	84	88	88	80	88	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	88	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	64	71	71	55	71	68	48	71	60	43	71	53	38
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	63	71	71	58	71	69	49	71	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	67	73	69	56	73	59	49	73	52	43	68	46	38	62	40	33
			Exposed	73	73	73	73	73	73	73	73	73	73	73	68	73	73	61	73	68	56	73	62	51	73	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	70	78	71	57	78	62	48	78	55	41	76	49	35
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	77	69	78	74	61	78	63	49	78	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	80	70	80	75	60	76	69	52	69	61	45
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	77	82	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	62	71	71	52	71	64	45	71	55	39	66	48	34	58	42	30	51	38	40
			Exposed	71	71	71	71	71	67	71	71	59	71	71	54	71	68	49	71	63	44	71	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	72	73	73	66	73	72	60	73	67	55	73	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	73	73	66	73	71	58	73	64	52	73	57	47	73	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	68	53	78	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	78	78	77	78	78	72	78	75	64	78	69	55	78	63	48	78	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	76	81	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	82	82	82	82	82	78	82	82	75	82	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	69	73	73	62	73	73	57	73	72	52	73	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	73	73	62	73	73	56	73	70	50	73	64	45	73	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	75	75	75	75	75	74	75	75	68	75	73	61	75	67	55	75	61	50	75	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	75	67	55	75	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	80	80	80	80	80	80	80	80	79	80	80	75	80	77	68	80	73	59	80	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	80	77	68	80	71	57	80	64	50	80	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	80	84	84	76	83	81	72	82	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	84	84	76	84	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
50	B	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	55	64	64	48	64	60	43	64	53	38
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	58	64	64	49	64	59	42	64	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	56	67	59	49	67	52	43	67	46	38	62	40	33
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	56	67	62	51	67	52	43	67	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	71	57	75	62	48	75	55	41	75	49	35
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	74	61	75	63	49	75	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	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	76	76	76	70	76	75	60	75	69	52	69	61	45
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	62	64	64	52	64	64	45	64	55	39	64	48	34	58	42	30	51	38	40
			Exposed	64	64	64	64	64	64	64	64	59	64	64	54	64	64	49	64	63	44	64	57	41	64	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	67	60	67	67	55	67	56	46	67	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	67	67	66	67	67	58	67	64	52	67	57	47	67	52	43	67	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	68	75	68	53	75	58	44	75	50	36	72	44	31	66	39	26	58	34	24
			Exposed	75	75	75	75	75	72	75	75	64	75	69	55	75	63	48	75	57	43	75	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	67	76	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	76	76	76	76	76	76	76	76	75	76	76	69	76	76	61	76	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	57	67	67	52	67	62	44	67	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	67	67	62	67	67	56	67	67	50	67	64	45	67	58	41	67	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	70	70	70	70	70	70	70	70	68	70	70	61	70	67	55	70	61	50	70	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	70	67	55	70	59	49	70	53	44	70	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	75	77	77	68	77	73	59	77	67	53	77	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	77	77	68	77	71	57	77	64	50	77	58	44	77	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	80	80	72	79	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	80	80	76	80	80	71	80	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	48	58	58	43	58	53	38
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	58	42	58	51	36	58	45	32	54	39	42	48	35	37
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	56	61	59	49	61	52	43	61	46	38	61	40	33
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	56	61	61	51	61	52	43	61	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	70*	72*	71*	57	72*	62	48	72*	55	41	72*	49	35
			Exposed	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	69	72*	72*	61	72*	63	49	72*	54	40	72*	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	60	70*	69*	52	69*	61	45
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	61	70*	68*	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	45	58	55	39	58	48	34	58	42	30	51	38	40
			Exposed	58	58	58	58	58	58	58	58	58	58	58	54	58	58	49	58	58	44	58	57	41	58	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	55	61	56	46	61	48	40	61	42	34	55	36	30	49	32	40	43	43	36
			Exposed	61	61	61	61	61	58	61	61	52	61	57	47	61	52	43	61	47	39	61	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	68	72*	68	53	72*	58	44	72*	50	36	72*	44	31	66	39	26	58	34	24
			Exposed	72*	72*	72*	72*	72*	72*	72*	72*	64	72*	69	55	72*	63	48	72*	57	43	72*	52	38	72*	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	55	70*	63	47	61	55	40	54	48	34	48	43	30
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	61	70*	70*	54	70*	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	62	52	62	62	44	62	53	38	62	46	33	55	40	43	49	35	38	43	32	34
			Exposed	62	62	62	62	62	56	62	62	50	62	62	45	62	58	41	62	53	37	62	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	61	64	64	55	64	61	50	64	56	46	64	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	64	64	55	64	59	49	64	53	44	64	48	40	64	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	68	73	73	59	73	67	53	73	57	43	73	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	73	73	68	73	71	57	73	64	50	73	58	44	73	53	39	73	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72	73*	73*	67	73*	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	73*	73*	73*	73*	73*	71	73*	73*	63	73*	72	55	73*	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
70	B	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	50	38
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	42	50	50	36	50	45	32	50	39	42	48	35	37
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	52	43	54	46	38	54	40	33
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	52	43	54	45	37	54	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	57	66*	62*	48	66*	55	41	66*	49	35
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	61*	66*	63*	49	66*	54	40	66*	47	33	66*	41	28	61*	36	25	54	32	33
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	61*	65*	65*	52	65*	61*	45
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	61*	65*	65*	51	65*	59*	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	39	50	48	34	50	42	30	50	38	40
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	44	50	50	41	50	48	34	50	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	48	40	54	42	34	54	36	30	49	32	40	43	43	36
			Exposed	54	54	54	54	54	54	54	54	52	54	54	47	54	52	43	54	47	39	54	43	36	54	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	53	66*	58	44	66*	50	36	67*	44	31	66*	39	26	58	34	24
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	64*	66*	66*	55	66*	63*	48	66*	57	43	66*	52	38	66*	44	31	65*	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	55	65*	63*	47	61*	55	40	54	48	34	48	43	30
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	61*	65*	65*	54	65*	65*	49	62*	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	44	55	53	38	55	46	33	55	40	43	49	35	38	43	32	34
			Exposed	55	55	55	55	55	55	55	55	50	55	55	45	55	55	41	55	53	37	55	48	34	55	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	55	60	60	50	60	56	46	60	47	39	60	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	60	60	55	60	59	49	60	53	44	60	48	40	60	44	36	60	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	59	70*	67*	53	70*	57	43	70*	49	35	70*	42	29	63	37	25	55	32	34	49	43	30
			Exposed	70*	70*	68*	70*	70*	57	70*	64	50	70*	58	44	70*	53	39	70*	48	34	70*	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	67*	69*	69*	54	68*	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	64*	69*	69*	55	69*	67*	49	68*	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
80	B	0-7	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	43	44	44	38
			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	42	44	44	36	44	44	32	44	39	42	44	35	37
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	46	38	48	40	33
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	45	37	48	39	32	48	34	42	46	30	37	40	40	33
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	57*	62*	62*	48	62*	55*	41	62*	49	35
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	49	62*	54*	40	62*	47	33	62*	41	28	61*	36	25	54*	32	33
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	60*	62*	62*	52*	62*	61*	45
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	51	62*	59*	43	57*	52*	36	50	45	31	45	40	27
	C	0-7	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	39	44	44	34	44	42	30	44	38	40
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	34	44	42	44	44	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	42	34	48	36	30	48	32	40	43	43	36
			Exposed	48	48	48	48	48	48	48	48	48	48	48	47	48	48	43	48	47	39	48	43	36	48	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	53	62*	58*	44	62*	50	36	62*	44	31	61*	39	26	58*	34	24
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	62*	48	62*	57*	43	62*	52	38	62*	44	31	62*	38	26	56*	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	62*	47	61*	55*	40	54*	48	34	48	43	30	43	30	
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	55*	62*	62*	49	62*	56*	40	53*	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	38	49	46	33	49	40	43	49	35	38	43	32	34
			Exposed	49	49	49	49	49	49	49	49	49	49	49	45	49	49	41	49	49	37	49	48	34	49	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	46	53	47	39	53	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	53	53	53	53	53	49	53	53	44	53	48	40	53	44	36	53	40	33	53	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	59	65*	65*	53	65*	57	43	65*	49	35	64*	42	29	63*	37	25	55	32	34	49	43	30
			Exposed	65*	65*	65*	65*	65*	57	65*	64*	50	65*	58	44	65*	53	39	65*	48	34	65*	44	31	63*	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	54	65*	61*	45	59*	53	38	51	46	32	45	41	28	40	36	37
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	63*	65*	65*	55	65*	65*	49	65*	60*	44	61*	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	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	38
			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	36	39	39	32	39	39	42	39	35	37
		7-20	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	38	43	40	33
			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	37	43	39	32	43	34	42	43	30	37	40	40	33
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	70	73*	73*	59
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	69	73*	70	55	73*	62	43	73*	54	37	73*	48	33
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	59	71*	68	49	68	60	41
	C	0-7	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	34	39	39	30	39	38	40
			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	44	39	36	39	39	31	34	38	42	30	34	37	26
		7-20	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	40	43	42	34	43	36	30	43	32	40	43	43	36
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	37	30	43	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	62	73*	67	49	73*	58	40	73*	52	36
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	67	50	73*	57	39	73*	50	34	71	43	30	65	38	26	58	34	23
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	66	71*	71*	55	71*	65	46
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	67	71*	71*	53	70*	62	43	61	54	36	54	48	32	48	43	27
	D	0-7	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	38	44	44	33	44	40	43	44	35	38	43	32	34
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	34	44	41	44	44	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	47	47	39	47	40	33	47	35	29	47	31	38	41	41	34	36	36	30
			Exposed	47	47	47	47	47	47	47	47	44	47	47	40	47	44	36	47	40	33	47	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	59*	62*	62*	53	62*	57*	43	62*	49	35	62*	42	29	61*	37	25	55*	32	34	49	43	30
			Exposed	62*	62*	62*	62*	62*	57*	62*	62*	50	62*	58*	44	62*	53	39	62*	48	34	62*	44	31	62*	37	25	54*	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	54*	62*	61*	72	59*	53*	62	52*	69	51	69	62	42	61	55	37
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56*	62*	62*	75	62*	60*	71	61*	55*	67	52*	70	52	68	60	41	58	52	35	51	46	30	45	40	26	40	36	22
100	B	0-7	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
			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	32	36	36	42	36	35	37
		7-20	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	38	39	39	33
			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	37	39	39	32	39	34	42	39	30	37	39	40	33
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	59
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	55	70*	62	43	70*	54	37	70*	48	33
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	59	68*	68*	49	68*	60	41
	C	0-7	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	34	36	36	30	36	36	40
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	44	36	36	39	36	31	34	36	42	30	34	37	26
		7-20	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	34	39	36	30	39	32	40	39	43	36
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	37	30	39	31	39	39	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	62	70*	67*	49	70*	58	40	70*	52	36
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	67*	70*	67*	50	70*	57	39	70*	50	34	70*	43	30	65	38	26	58	34	23
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	66*	68*	68*	55	68*	65*	46
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	67*	68*	68*	53	68*	63*	43	61	54	36	54	48	32	48	43	27
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	38	39	39	33	39	39	43	39	35	38	39	32	34
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	34	39	39	44	39	35	37	39	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	40	33	43	35	29	43	31	38	41	41	34	36	36	30
			Exposed	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	40	33	43	36	30	43	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72*	73*	72*	59	73*	63	45	73*	56	38	73*	49	34	71	44	30
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	72*	57	73*	67	49	73*	56	39	73*	48	33	69	42	29	62	37	25	55	32	22	49	29	20
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	62	71*	69*	51	69*	61	42	61	55	37
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	66	71*	70*	52	68	60	41	58	52	35	51	46	30	45	40	26	40	36	22

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	83	83	83	83	83	83	83	83	79	83	83	76	83	83	72	83	80	68	83	77	61	82	71	47	77	62	39	72	50	34	66	42	29	54	37	26	46	32	23
			Exposed	83	83	72	83	79	67	83	76	57	83	72	49	80	68	42	77	61	38	74	53	35	66	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	83	83	83	83	83	80	83	83	77	83	79	73	83	76	68	82	73	61	79	68	52	75	53	40	68	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	83	76	68	81	71	58	78	66	48	75	56	41	71	47	37	68	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	81	84	82	77	84	79	74	84	76	70	83	69	56	79	56	42	74	44	35	69	38	29	61	33	25	53	30	21
			Exposed	84	82	77	84	78	73	84	75	68	84	70	58	81	65	49	78	55	41	76	47	37	69	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	78	84	82	75	82	77	68	77	71	55	72	63	44	64	51	37	50	42	32	41	37	27
			Exposed	84	84	81	84	84	77	84	81	74	83	78	69	80	75	63	77	70	54	74	67	47	65	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	83	83	75	83	81	70	83	78	64	83	75	55	82	71	47	79	67	41	76	59	38	69	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	82	70	47	78	65	40	75	56	36	70	48	33	66	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	83	78	71	83	75	66	80	70	54	77	63	45	74	53	40	70	45	36	67	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	74	53	40	69	43	35	64	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	84	84	80	84	80	76	84	77	71	84	73	66	83	69	56	80	62	47	78	53	40	72	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	83	68	55	80	60	45	76	50	38	73	42	33	69	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	84	84	83	84	84	79	84	83	76	84	80	72	82	77	68	79	74	60	76	70	52	69	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	82	77	68	78	73	58	75	68	49	70	60	42	65	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	83	79	67	83	76	58	83	72	49	79	67	42	76	60	38	73	52	35	69	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	76	59	38	72	50	34	67	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	82	72	59	78	67	48	75	55	41	71	46	37	67	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	67	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	84	78	74	84	75	68	84	70	58	81	64	48	78	54	41	75	46	36	72	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	78	53	41	74	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	84	84	77	84	81	74	83	78	69	80	74	62	76	70	53	73	66	45	69	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	76	70	52	72	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
10	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	74	61	74	71	47	74	62	39	72	50	34	66	42	29	54	37	26	46	32	23
			Exposed	74	74	72	74	74	67	74	74	57	74	72	49	74	68	42	74	61	38	74	53	35	66	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	73	74	74	68	74	73	61	74	68	52	74	53	40	68	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	74	74	68	74	71	58	74	66	48	74	56	41	71	47	37	68	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	79	74	81	76	70	81	69	56	79	56	42	74	44	35	69	38	29	61	33	25	53	30	21
			Exposed	81	81	77	81	78	73	81	75	68	81	70	58	81	65	49	78	55	41	76	47	37	69	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	83	78	83	82	75	82	77	68	77	71	55	72	63	44	64	51	37	50	42	32	41	37	27
			Exposed	83	83	81	83	83	77	83	81	74	83	78	69	80	75	63	77	70	54	74	67	47	65	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	74	74	74	74	74	70	74	74	64	74	74	55	74	71	47	74	67	41	74	59	38	69	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	74	70	47	74	65	40	74	56	36	70	48	33	66	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	74	74	71	74	74	66	74	70	54	74	63	45	74	53	40	70	45	36	67	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	74	53	40	69	43	35	64	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	81	81	80	81	80	76	81	77	71	81	73	66	81	69	56	80	62	47	78	53	40	72	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	81	68	55	80	60	45	76	50	38	73	42	33	69	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	83	83	83	83	83	79	83	83	76	83	80	72	82	77	68	79	74	60	76	70	52	69	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	82	77	68	78	73	58	75	68	49	70	60	42	65	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	74	74	67	74	74	58	74	72	49	74	67	42	74	60	38	73	52	35	69	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	74	59	38	72	50	34	67	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	74	72	59	74	67	48	74	55	41	71	46	37	67	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	67	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	82	78	74	82	75	68	82	70	58	81	64	48	78	54	41	75	46	36	72	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	78	53	41	74	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	84	84	77	84	81	74	83	78	69	80	74	62	76	70	53	73	66	45	69	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	76	70	52	72	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
20	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	47	62	62	39	62	50	34	62	42	29	54	37	26	46	32	23
			Exposed	62	62	62	62	62	62	62	62	57	62	62	49	62	62	42	62	61	38	62	53	35	62	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	52	62	53	40	62	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	62	62	62	62	62	58	62	62	48	62	56	41	62	47	37	62	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	70	75	69	56	75	56	42	74	44	35	69	38	29	61	33	25	53	30	21
			Exposed	75	75	75	75	75	73	75	75	68	75	70	58	75	65	49	75	55	41	75	47	37	69	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	68	77	71	55	72	63	44	64	51	37	50	42	32	41	37	27
			Exposed	77	77	77	77	77	77	77	77	74	77	77	69	77	75	63	77	70	54	74	67	47	65	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	59	38	62	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	62	62	47	62	62	40	62	56	36	62	48	33	62	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	62	62	62	62	62	62	62	62	54	62	62	45	62	53	40	62	45	36	62	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	62	53	40	62	43	35	62	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	75	75	75	75	75	75	75	75	71	75	73	66	75	69	56	75	62	47	75	53	40	72	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	75	68	55	75	60	45	75	50	38	73	42	33	69	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	77	77	77	77	77	77	77	77	76	77	77	72	77	77	68	77	74	60	76	70	52	69	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	77	77	68	77	73	58	75	68	49	70	60	42	65	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	62	62	62	62	62	58	62	62	49	62	62	42	62	60	38	62	52	35	62	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	62	59	38	62	50	34	62	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	62	62	59	62	62	48	62	55	41	62	46	37	62	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	62	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	76	76	74	76	75	68	76	70	58	76	64	48	76	54	41	75	46	36	72	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	76	53	41	74	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	78	78	77	78	78	74	78	78	69	78	74	62	76	70	53	73	66	45	69	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	76	70	52	72	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	47	61	61	39	61	50	34	61	42	29	54	37	26	46	32	23
			Exposed	61	61	61	61	61	61	61	61	57	61	61	49	61	61	42	61	61	38	61	53	35	61	42	30	53	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	52	62	53	40	62	42	34	59	36	30	50	31	26	42	28	23	38	25	20
			Exposed	62	62	62	62	62	58	62	62	48	62	56	41	62	47	37	62	41	34	62	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	69*	56	71*	56	42	71*	44	35	69*	38	29	61	33	25	53	30	21
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	68*	71*	70*	58	71*	65	49	71*	55	41	71*	47	37	69*	38	30	60	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	55	70*	63	44	64	51	37	50	42	32	41	37	27
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	63	70*	70*	54	70*	67*	47	66*	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	55	61	61	47	61	61	41	61	59	38	61	46	32	59	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	61	61	47	61	61	40	61	56	36	61	48	33	61	42	30	58	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	62	62	62	62	62	62	62	62	54	62	62	45	62	53	40	62	45	36	62	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	62	53	40	62	43	35	62	39	32	56	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	66	71*	69*	56	71*	62	47	71*	53	40	71*	41	32	66	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	71*	68*	55	71*	60	45	71*	50	38	71*	42	33	69*	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	60	70*	70*	52	69*	58	41	55	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	70*	70*	68*	70*	70*	58	70*	68*	49	70*	60	42	66*	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	62	62	62	62	62	58	62	62	49	62	62	42	62	60	38	62	52	35	62	46	32	57	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	62	59	38	62	50	34	62	43	30	59	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	62	62	59	62	62	48	62	55	41	62	46	37	62	41	33	61	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	62	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	72*	72*	72*	72*	72*	68	72*	70	58	72*	64	48	72*	54	41	72*	46	36	72*	41	32	64	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	72*	53	41	72*	44	35	70	39	30	66	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	69*	71*	71*	62	71*	70*	53	71*	66	45	69*	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	71*	70*	52	71*	63	44	67	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
40	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	52	39	52	50	34	52	42	29	52	37	26	46	32	23
			Exposed	52	52	52	52	52	52	52	52	52	52	52	49	52	52	42	52	52	38	52	52	35	52	42	30	52	36	25	43	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	53	40	55	42	34	55	36	30	50	31	26	42	28	23	38	25	20
			Exposed	55	55	55	55	55	55	55	55	48	55	55	41	55	47	37	55	41	34	55	38	31	50	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56	63*	56	42	63*	44	35	63*	38	29	61*	33	25	53	30	21
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	58*	63*	63*	49	63*	55	41	63*	47	37	63*	38	30	60*	33	24	50	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	56*	64*	63*	44	64*	51	37	50	42	32	41	37	27
			Exposed	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	63*	64*	64*	54	64*	64*	47	64*	51	37	49	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	52	41	52	52	38	52	46	32	52	39	27	47	33	24	40	29	21	35	26	18	31	23	24
			Exposed	52	52	47	52	52	40	52	52	36	52	48	33	52	42	30	52	38	27	51	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	55	55	55	55	55	55	55	55	54	55	55	45	55	53	40	55	45	36	55	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	55	53	40	55	43	35	55	39	32	55	35	29	50	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56	63*	62*	47	63*	53	40	63*	41	32	63*	35	26	55	30	22	46	27	19	40	23	16	36	21	14
			Exposed	63*	63*	55	63*	60*	45	63*	50	38	63*	42	33	63*	38	29	63*	35	26	58*	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	60*	64*	64*	52	64*	58*	41	56*	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	64*	64*	64*	64*	64*	58*	64*	64*	49	64*	60*	42	64*	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	55	55	55	55	55	55	55	55	49	55	55	42	55	55	38	55	52	35	55	46	32	55	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	55	55	38	55	50	34	55	43	30	55	39	27	51	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	59	59	59	59	59	48	59	55	41	59	46	37	59	41	33	59	37	30	54	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	59	40	33	59	36	30	51	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	58	65*	64*	48	65*	54	41	65*	46	36	65*	41	32	64*	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	65*	53	41	65*	44	35	65*	39	30	65*	35	27	58	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	62*	66*	66*	53	66*	66*	45	66*	57	40	53	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	66*	66*	52	66*	63*	44	66*	53	38	56	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
50	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	39	42	42	34	42	42	29	42	37	26	42	32	23
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	35	42	42	30	42	36	25	42	31	22	37	27	19	33	24	17	29	21	23
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	42	34	46	36	30	46	31	26	42	28	23	38	25	20
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	37	46	41	34	46	38	31	46	32	26	42	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	56*	58*	56*	42	58*	44	35	58*	38	29	58*	33	25	53*	30	21
			Exposed	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	49	58*	55*	41	58*	47	37	58*	38	30	58*	33	24	50*	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	55*	60*	60*	44	60*	51*	37	50*	42	32	41	37	27
			Exposed	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	54*	60*	60*	47	60*	52*	37	49*	41	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	38	42	42	32	42	39	27	42	33	24	40	29	21	35	26	18	31	23	24
			Exposed	42	42	42	42	42	40	42	42	36	42	42	33	42	42	30	42	38	27	42	35	25	40	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	45	46	46	40	46	45	36	46	40	33	46	34	28	45	29	24	39	25	21	34	22	18	30	19	24	26	17	22
			Exposed	46	46	40	46	43	35	46	39	32	46	35	29	46	32	26	44	29	24	40	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	56*	58*	58*	47	58*	53*	40	58*	41	32	58*	35	26	55*	30	22	46	27	19	40	23	16	36	21	14
			Exposed	58*	58*	55*	58*	58*	45	58*	50*	38	58*	42	33	58*	38	29	58*	35	26	58*	32	23	47	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	52*	60*	58*	41	55*	45	34	43	38	28	37	33	24	33	29	21	29	26	18
			Exposed	60*	60*	60*	60*	60*	58*	60*	60*	49*	60*	60*	42	60*	51*	37	54*	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	42	47	47	38	47	47	35	47	46	32	47	38	27	45	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	47	47	38	47	47	34	47	43	30	47	39	27	47	35	25	45	32	23	40	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	50	50	50	50	50	48	50	50	41	50	46	37	50	41	33	50	37	30	50	34	28	44	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	50	40	33	50	36	30	50	32	27	45	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	61*	61*	61*	61*	61*	61*	61*	61*	58*	61*	61*	48	61*	54*	41	61*	46	36	61*	41	32	61*	34	26	53	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	61*	53	41	61*	44	35	61*	39	30	61*	35	27	58*	32	23	52	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	53*	62*	62*	45	62*	57*	40	54*	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	62*	62*	53*	62*	62*	44	62*	53*	38	56*	45	34	47	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	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	34	35	35	29	35	35	26	35	32	23
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	35	25	35	31	22	35	27	19	33	24	17	29	21	23
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	30	38	31	26	38	28	23	38	25	20
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	34	38	38	31	38	32	26	38	27	22	36	23	19	31	21	17	28	18	23	25	24	20
		20-27	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*	42	52*	44*	35	52*	38	29	52*	33	25	51*	30	21
			Exposed	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	49*	52*	52*	41	52*	47*	37	52*	38	30	52*	33	24	50*	28	20	42	25	17	37	22	15	33	19	20
		27-45	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	44*	55*	51*	37	50*	42*	32	42*	37	27
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	54*	55*	55*	47*	55*	51*	37	49*	41*	31	40	36	26	35	31	22	31	27	19	27	24	17
	C	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	32	35	35	27	35	33	24	35	29	21	35	26	18	31	23	24
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	35	27	35	35	25	35	29	21	35	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	33	38	34	28	38	29	24	38	25	21	34	22	18	30	19	24	26	17	22
			Exposed	38	38	38	38	38	35	38	38	32	38	35	29	38	32	26	38	29	24	38	26	22	34	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	47*	52*	52*	40	52*	41	32	52*	35	26	52*	30	22	46*	27	19	40	23	16	36	21	14
			Exposed	52*	52*	52*	52*	52*	45*	52*	50*	38	52*	42	33	52*	38	29	52*	35	26	52*	32	23	47*	27	19	39	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	52*	55*	55*	41*	54*	45*	34	43*	38	28	37	33	24	33	29	21	29	26	18
			Exposed	55*	55*	55*	55*	55*	55*	55*	55*	49*	55*	55*	42*	55*	51*	37	54*	44*	33	46*	40	30	38	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	35	39	39	32	39	38	27	39	32	23	38	28	20	34	24	17	30	21	23	26	19	20
			Exposed	39	39	38	39	39	34	39	39	30	39	39	27	39	35	25	39	32	23	39	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	43	43	43	43	43	43	43	43	41	43	43	37	43	41	33	43	37	30	43	34	28	43	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	43	40	33	43	36	30	43	32	27	43	29	24	41	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	55*	48*	55*	54*	41	55*	46	36	55*	41	32	55*	34	26	53*	30	21	44	26	18	38	22	15	34	20	20	30	17	18
			Exposed	55*	53*	41	55*	44	35	55*	39	30	55*	35	27	55*	32	23	52*	29	21	46	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	58*	53*	58*	58*	46*	58*	57*	40	53*	44	33	41	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	58*	58*	52*	58*	58*	44	58*	53*	38	56*	45*	34	47*	40	30	41	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
70	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	29	31	31	26	31	31	23
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	25	31	31	22	31	27	19	31	24	17	29	21	23
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	31	26	33	28	23	33	25	20
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	32	26	33	27	22	33	23	19	31	21	17	28	18	23	25	24	20
		20-27	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	42*	45*	44*	35	45*	38*	29	45*	33	25	45*	30	21
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	41*	45*	45*	37	45*	38*	30	45*	33	24	45*	28	20	42*	25	17	37	22	15	33	19	20
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	44*	50*	50*	37*	48*	42*	32	41*	37*	27
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	37*	49*	41*	31	40*	36*	26	35	31	22	31	27	19	27	24	17
	C	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	27	31	31	24	31	29	21	31	26	18	31	23	24
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	27	31	31	25	31	29	21	31	25	18	30	22	23	26	19	20	23	25	18	20	23	~~16~~
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	29	24	33	25	21	33	22	18	30	19	24	26	17	22
			Exposed	33	33	33	33	33	33	33	33	32	33	33	29	33	32	26	33	29	24	33	26	22	33	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	40*	45*	41*	32	45*	35	26	45*	30	22	44*	27	19	40*	23	16	36	21	14
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	38*	45*	42*	33	45*	38*	29	45*	35	26	45*	32	23	45*	27	19	39*	23	16	34	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	41*	49*	45*	34	43*	38*	28	37*	33	24	33	29	21	29	26	18
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	49*	51*	51*	42*	51*	51*	37*	51*	44*	33	46*	40*	30	38*	34	24	32	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	27	34	32	23	34	28	20	34	24	17	30	21	23	26	19	20
			Exposed	34	34	34	34	34	34	34	34	30	34	34	27	34	34	25	34	32	23	34	29	21	34	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	37	30	37	34	28	37	29	24	37	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	37	37	33	37	36	30	37	32	27	37	29	24	37	26	22	37	24	20	34	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	48*	49*	49*	41	49*	46*	36	49*	41	32	49*	34	26	49*	30	21	44*	26	18	38	22	15	34	20	20	30	17	18
			Exposed	49*	49*	41	49*	44*	35	49*	39	30	49*	35	27	49*	32	23	49*	29	21	46*	27	19	39	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	53*	54*	54*	45*	54*	54*	40*	52*	44*	33	41*	37	27	36	32	23	31	28	20	28	25	17	24	22	15
			Exposed	54*	54*	52*	54*	54*	44*	54*	53*	38	54*	45*	34	47*	40*	30	41*	37	27	37	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~
80	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	27	27	23
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	22	27	27	19	27	24	17	27	21	23
		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	26	29	28	23	29	25	20
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26	29	27	22	29	23	19	29	21	17	28	18	23	25	24	20
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	35*	40*	38*	29	40*	33*	25	40*	30	21
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	38*	30	40*	33*	24	40*	28	20	40*	25	17	37*	22	15	33*	19	20
		27-45	Interior	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	44*	46*	46*	37*	44*	42*	32*	41*	37*	27
			Exposed	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	47*	48*	48*	37*	48*	41*	31	40*	36*	26	35*	31	22	31	27	19	27	24	17
	C	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	21	27	26	18	27	23	24
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	21	27	25	18	27	22	23	26	19	20	23	25	18	20	23	~~16~~
		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	28	29	29	24	29	25	21	29	22	18	29	19	24	26	17	22
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26	29	29	24	29	26	22	29	22	18	29	19	24	25	25	21	22	22	18	19	19	~~16~~	17	17	~~14~~
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	32	40*	35*	26	40*	30	22	40*	27	19	39*	23	16	36*	21	14
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	38*	40*	40*	33*	40*	38*	29	40*	35*	26	40*	32	23	40*	27	19	39*	23	16	34*	20	21	30	17	18	26	23	16	23	21	~~14~~
		27-45	Interior	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	47*	47*	41*	45*	45*	34*	42*	38*	28	37*	33*	24	33*	29	21	29	26	18
			Exposed	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	42*	48*	48*	37*	48*	44*	33*	46*	40*	30	38*	34*	24	32*	29	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	28	20	30	24	17	30	21	23	26	19	20
			Exposed	30	30	30	30	30	30	30	30	30	30	30	27	30	30	25	30	30	23	30	29	21	30	25	17	29	21	23	25	18	20	22	24	17	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	29	24	32	24	20	32	21	17	28	18	23	25	25	20	22	22	18
			Exposed	32	32	32	32	32	30	32	32	27	32	29	24	32	26	22	32	24	20	32	22	18	29	19	23	24	24	20	21	21	17	18	18	~~15~~	25	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	41*	44*	44*	36	44*	41*	32	44*	34	26	44*	30	21	43*	26	18	38*	22	15	34	20	20	30	17	18
			Exposed	44*	44*	41*	44*	44*	35	44*	39*	30	44*	35	27	44*	32	23	44*	29	21	44*	27	19	39*	23	15	33	19	20	29	25	17	25	22	~~15~~	22	20	~~13~~	19	17	~~12~~
		27-45	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	45*	50*	50*	40*	48*	44*	33	41*	37*	27	36*	32	23	31	28	20	28	25	17	24	22	15
			Exposed	50*	50*	50*	50*	50*	44*	50*	50*	38*	50*	45*	34	47*	40*	30	41*	37*	27	37*	33	24	32	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	~~14~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	24	17	24	21	23
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	25	20
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	22	26	23	19	26	21	17	26	18	23	25	24	20
		20-27	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*	29	35*	33*	25	35*	30*	21
			Exposed	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	30*	35*	33*	24	35*	28	20	35*	25	17	35*	22	15	33*	19	20
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	44*	44*	44*	42*	42*	37*	41*	41*	32*	39*	37*	27
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	37*	45*	41*	31*	40*	36*	26	35*	31*	22	31*	27	19	27	24	17
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	23	24
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	22	23	24	19	20	23	25	18	20	23	16
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	25	21	26	22	18	26	19	24	26	17	22
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	22	18	26	19	24	25	25	21	22	22	18	19	19	16	17	17	14
		20-27	Interior	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	32*	35*	35*	26	35*	30*	22	35*	27	19	35*	23	16	35*	21	14
			Exposed	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	33*	35*	35*	29	35*	35*	26	35*	32*	23	35*	27	19	35*	23	16	34*	20	21	30*	17	18	26	23	16	23	21	14
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	43*	43*	41*	41*	41*	34*	39*	38*	28	37*	33*	24	33*	29*	21	29*	26	18
			Exposed	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	42*	45*	45*	37*	45*	44*	33*	45*	40*	30*	38*	34*	24	32*	29*	20	28	25	17	24	22	15	22	19	19	19	17	17
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	20	27	24	17	27	21	23	26	19	20
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	25	17	27	21	23	25	18	20	22	24	17	19	21	15	17	19	13
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	24	29	24	20	29	21	17	28	18	23	25	25	20	22	22	18
			Exposed	29	29	29	29	29	29	29	29	27	29	29	24	29	26	22	29	24	20	29	22	18	29	19	23	24	24	20	21	21	17	18	18	15	25	16	13	22	14	12
		20-27	Interior	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	39*	36*	39*	39*	32	39*	34*	26	39*	30	21	39*	26	18	38*	22	15	34*	20	20	30	17	18
			Exposed	39*	39*	39*	39*	39*	35*	39*	39*	30	39*	35*	27	39*	32	23	39*	29	21	39*	27	19	39*	23	15	33*	19	20	29	25	17	25	22	15	22	20	13	19	17	12
		27-45	Interior	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	48*	45*	46*	46*	40*	44*	44*	33*	41*	37*	27	36*	32*	23	31*	28	20	28	25	17	24	22	15
			Exposed	48*	48*	48*	48*	48*	44*	48*	48*	38*	48*	45*	34*	47*	40*	30	41*	37*	27	37*	33*	24	32*	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	14
100	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	17	22	21	23
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	21	17	24	18	23	24	24	20
		20-27	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*	29*	32*	32*	25	32*	30*	21
			Exposed	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	30*	32*	32*	24	32*	28*	20	32*	25	17	32*	22	15	32*	19	20
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	48*	53*	53*	41*
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	47*	53*	53*	39*	53*	47*	34	46*	42*	29	41*	37	25
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	24
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	23	22	19	20	22	25	18	20	23	16
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	22	18	24	19	24	24	17	22
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	22	18	24	19	24	24	25	21	22	22	18	19	19	16	17	17	14
		20-27	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*	26	32*	30*	22	32*	27*	19	32*	23	16	32*	21	14
			Exposed	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	32*	29*	32*	32*	26	32*	32*	23	32*	27*	19	32*	23	16	32*	20	21	30*	17	18	26	23	16	23	21	14
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	51*	53*	53*	43*	53*	51*	37	50*	45*	31	44*	40*	27
			Exposed	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	50*	53*	53*	45*	53*	51*	37	49*	44*	31	42*	38	26	37	33	22	33	29	19	29	26	17
	D	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	23	24	24	20	24	24	17	24	21	23	24	19	20
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	17	24	21	23	24	18	20	22	24	17	19	21	15	17	19	13
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	24	20	26	21	17	26	18	23	25	25	20	22	22	18
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	22	26	24	20	26	22	18	26	19	23	24	24	20	21	21	17	18	18	15	25	16	13	22	14	12
		20-27	Interior	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	32*	35*	34*	26	35*	30*	21	35*	26	18	35*	22	15	34*	20	20	30*	17	18
			Exposed	35*	35*	35*	35*	35*	35*	35*	35*	30*	35*	35*	27	35*	32*	23	35*	29	21	35*	27	19	35*	23	15	33*	19	20	29	25	17	25	22	15	22	20	13	19	17	12
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	44*	44*	44*	43*	43*	40*	41*	41*	33*	39*	37*	27	36*	32*	23	31*	28	20	28	25	17	24	22	15
			Exposed	45*	45*	45*	45*	45*	44*	45*	45*	38*	45*	45*	34*	45*	40*	30*	41*	37*	27	37*	33*	24	32*	28	20	27	24	16	23	21	21	20	18	18	18	25	16	24	22	14

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	96	98	98	92	98	98	87	98	97	84	98	93	80	98	86	74	93	80	66	87	76	57	82	69	49	77	62	44	73	55	39
			Exposed	98	98	87	98	96	83	98	91	79	98	87	75	96	83	70	92	80	65	89	77	59	82	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	99	99	99	99	99	99	99	99	93	99	97	88	99	92	84	99	88	80	98	84	77	89	78	68	84	70	58	79	60	50	75	53	44	69	47	39	63	41	34
			Exposed	99	92	84	99	87	79	95	82	75	90	78	69	86	75	63	83	69	57	80	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	96	90	99	92	86	99	85	79	95	79	71	89	72	59	84	64	49	80	56	42	76	50	36
			Exposed	99	99	94	99	95	89	99	90	84	99	85	80	99	82	76	94	78	70	91	75	63	85	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99	100	100	95	100	100	91	100	93	84	94	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	100	100	99	100	100	93	100	99	89	100	94	85	98	90	81	93	86	77	89	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	98	98	90	98	98	86	98	94	81	98	90	78	98	86	74	95	83	69	92	79	63	85	73	54	79	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	98	86	74	94	82	68	90	78	61	86	75	55	82	69	50	79	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	99	96	87	99	90	82	99	85	78	93	81	74	89	77	68	86	74	61	83	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	89	77	67	85	72	60	81	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	99	99	98	99	99	92	99	93	87	99	89	82	99	84	78	98	81	75	93	77	69	87	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	99	84	78	96	80	74	92	76	67	88	70	56	84	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	100	100	100	100	100	97	100	100	92	100	97	87	100	93	84	97	89	80	92	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	100	93	83	96	88	79	90	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	98	96	83	98	91	79	98	87	75	96	83	70	92	80	64	88	76	58	85	73	53	79	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	92	79	64	87	76	57	83	71	51	79	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	99	87	80	95	82	75	90	78	69	86	74	62	83	68	56	80	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	83	68	56	79	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	99	95	89	99	90	84	99	85	79	98	81	75	94	78	70	90	74	61	87	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	93	77	69	89	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	100	100	94	100	99	89	100	94	84	98	89	81	93	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	93	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
10	B	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	88	84	88	88	80	88	86	74	88	80	66	87	76	57	82	69	49	77	62	44	73	55	39
			Exposed	88	88	87	88	88	83	88	88	79	88	87	75	88	83	70	88	80	65	88	77	59	82	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	88	80	88	84	77	88	78	68	84	70	58	79	60	50	75	53	44	69	47	39	63	41	34
			Exposed	88	88	84	88	87	79	88	82	75	88	78	69	86	75	63	83	69	57	80	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	96	96	90	96	92	86	96	85	79	95	79	71	89	72	59	84	64	49	80	56	42	76	50	36
			Exposed	96	96	94	96	95	89	96	90	84	96	85	80	96	82	76	94	78	70	91	75	63	85	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	91	99	93	84	94	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	99	99	99	99	99	93	99	99	89	99	94	85	98	90	81	93	86	77	89	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	88	88	88	88	88	86	88	88	81	88	88	78	88	86	74	88	83	69	88	79	63	85	73	54	79	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	88	86	74	88	82	68	88	78	61	86	75	55	82	69	50	79	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	88	88	87	88	88	82	88	85	78	88	81	74	88	77	68	86	74	61	83	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	88	77	67	85	72	60	81	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	96	96	96	96	96	92	96	93	87	96	89	82	96	84	78	96	81	75	93	77	69	87	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	96	84	78	96	80	74	92	76	67	88	70	56	84	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	99	99	99	99	99	97	99	99	92	99	97	87	99	93	84	97	89	80	92	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	99	93	83	96	88	79	90	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	88	88	83	88	88	79	88	87	75	88	83	70	88	80	64	88	76	58	85	73	53	79	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	88	79	64	87	76	57	83	71	51	79	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	88	87	80	88	82	75	88	78	69	86	74	62	83	68	56	80	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	83	68	56	79	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	97	95	89	97	90	84	97	85	79	97	81	75	94	78	70	90	74	61	87	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	93	77	69	89	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	99	99	94	99	99	89	99	94	84	98	89	81	93	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	93	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
20	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	66	78	76	57	78	69	49	77	62	44	73	55	39
			Exposed	78	78	78	78	78	78	78	78	78	78	78	75	78	78	70	78	78	65	78	77	59	78	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	68	78	70	58	78	60	50	75	53	44	69	47	39	63	41	34
			Exposed	78	78	78	78	78	78	78	78	75	78	78	69	78	75	63	78	69	57	78	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	86	89	85	79	89	79	71	89	72	59	84	64	49	80	56	42	76	50	36
			Exposed	89	89	89	89	89	89	89	89	84	89	85	80	89	82	76	89	78	70	89	75	63	85	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	92	84	92	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	92	92	92	92	92	92	92	92	89	92	92	85	92	90	81	92	86	77	89	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	78	63	78	73	54	78	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	78	78	74	78	78	68	78	78	61	78	75	55	78	69	50	78	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	61	78	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	78	77	67	78	72	60	78	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	89	89	89	89	89	89	89	89	87	89	89	82	89	84	78	89	81	75	89	77	69	87	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	89	84	78	89	80	74	89	76	67	88	70	56	84	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	87	92	92	84	92	89	80	92	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	92	92	83	92	88	79	90	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	78	78	78	78	78	78	78	78	75	78	78	70	78	78	64	78	76	58	78	73	53	78	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	78	78	64	78	76	57	78	71	51	78	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	78	78	78	78	78	75	78	78	69	78	74	62	78	68	56	78	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	78	68	56	78	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	90	90	89	90	90	84	90	85	79	90	81	75	90	78	70	90	74	61	87	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	90	77	69	89	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	93	93	93	93	93	89	93	93	84	93	89	81	93	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	93	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	66	77	76	57	77	69	49	77	62	44	73	55	39
			Exposed	77	77	77	77	77	77	77	77	77	77	77	75	77	77	70	77	77	65	77	77	59	77	70	50	77	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	68	78	70	58	78	60	50	75	53	44	69	47	39	63	41	34
			Exposed	78	78	78	78	78	78	78	78	75	78	78	69	78	75	63	78	69	57	78	63	52	75	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	79	83	79	71	83	72	59	83	64	49	80	56	42	76	50	36
			Exposed	83	83	83	83	83	83	83	83	83	83	83	80	83	82	76	83	78	70	83	75	63	83	64	50	80	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	84	87	86	78	87	81	72	81	76	62	76	70	53	70	62	46
			Exposed	87	87	87	87	87	87	87	87	87	87	87	85	87	87	81	87	86	77	87	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	69	77	77	63	77	73	54	77	65	46	74	56	40	67	49	35	59	43	31	53	38	41
			Exposed	77	77	74	77	77	68	77	77	61	77	75	55	77	69	50	77	64	45	76	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	74	61	78	68	56	77	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	78	77	67	78	72	60	78	65	54	78	59	48	75	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	82	83	83	78	83	81	75	83	77	69	83	69	55	82	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	83	83	78	83	80	74	83	76	67	83	70	56	83	64	50	81	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	84	87	87	80	87	85	77	85	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	87	87	83	87	87	79	87	84	75	86	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	78	78	78	78	78	78	78	78	75	78	78	70	78	78	64	78	76	58	78	73	53	78	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	78	78	64	78	76	57	78	71	51	78	65	46	76	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	78	78	78	78	78	75	78	78	69	78	74	62	78	68	56	78	62	51	77	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	78	68	56	78	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	85	85	85	85	85	84	85	85	79	85	81	75	85	78	70	85	74	61	85	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	85	77	69	85	72	59	85	66	51	82	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	88	88	88	88	88	88	88	88	84	88	88	81	88	85	77	88	82	73	84	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	88	85	77	87	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	57	71	69	49	71	62	44	71	55	39
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	65	71	71	59	71	70	50	71	61	43	71	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	70	58	74	60	50	74	53	44	69	47	39	63	41	34
			Exposed	74	74	74	74	74	74	74	74	74	74	74	69	74	74	63	74	69	57	74	63	52	74	53	44	69	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	71	79	72	59	79	64	49	79	56	42	76	50	36
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	78	70	79	75	63	79	64	50	79	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	78	82	81	72	81	76	62	76	70	53	70	62	46
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	81	82	82	77	82	82	74	82	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	63	71	71	54	71	65	46	71	56	40	67	49	35	59	43	31	53	38	41
			Exposed	71	71	71	71	71	68	71	71	61	71	71	55	71	69	50	71	64	45	71	59	42	68	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	74	61	74	68	56	74	57	47	72	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	74	74	67	74	72	60	74	65	54	74	59	48	74	53	44	71	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	77	69	79	69	55	79	59	45	77	51	37	73	45	31	67	40	27	60	35	24
			Exposed	79	79	78	79	79	74	79	76	67	79	70	56	79	64	50	79	58	44	79	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	77	82	79	69	78	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	82	82	82	82	82	79	82	82	75	82	80	70	82	76	63	78	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	70	74	74	64	74	74	58	74	73	53	74	64	45	73	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	74	74	64	74	74	57	74	71	51	74	65	46	74	59	42	72	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	76	76	76	76	76	75	76	76	69	76	74	62	76	68	56	76	62	51	76	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	76	68	56	76	61	50	76	54	45	72	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	81	81	81	81	81	81	81	81	79	81	81	75	81	78	70	81	74	61	81	69	54	81	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	81	77	69	81	72	59	81	66	51	81	59	45	79	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	85	85	85	85	85	85	85	85	84	85	85	81	85	85	77	84	82	73	83	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	85	85	77	85	81	72	83	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
50	B	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	57	65	65	49	65	62	44	65	55	39
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	50	65	61	43	65	52	37	63	46	32	55	40	29	49	36	38
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	58	67	60	50	67	53	44	67	47	39	63	41	34
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	57	67	63	52	67	53	44	67	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	72	59	75	64	49	75	56	42	75	50	36
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	75	63	75	64	50	75	55	41	75	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	72	77	76	62	76	70	53	70	62	46
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	76	63	76	69	52	67	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	54	65	65	46	65	56	40	65	49	35	59	43	31	53	38	41
			Exposed	65	65	65	65	65	65	65	65	61	65	65	55	65	65	50	65	64	45	65	59	42	65	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	56	67	57	47	67	49	41	65	42	35	57	37	31	50	33	41	44	29	36
			Exposed	67	67	67	67	67	60	67	65	54	67	59	48	67	53	44	67	48	40	67	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	69	55	75	59	45	75	51	37	73	45	31	67	40	27	60	35	24
			Exposed	75	75	75	75	75	74	75	75	67	75	70	56	75	64	50	75	58	44	75	54	39	73	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	73	57	72	64	48	63	56	41	55	50	35	49	44	30
			Exposed	77	77	77	77	77	77	77	77	75	77	77	70	77	76	63	77	72	56	75	67	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	68	58	68	68	53	68	64	45	68	54	39	65	47	33	56	41	29	50	36	39	44	32	35
			Exposed	68	68	64	68	68	57	68	68	51	68	65	46	68	59	42	68	54	38	67	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	71	71	71	71	71	71	71	71	69	71	71	62	71	68	56	71	62	51	71	57	47	71	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	71	68	56	71	61	50	71	54	45	71	49	41	68	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	75	77	77	70	77	74	61	77	69	54	77	58	43	76	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	77	77	69	77	72	59	77	66	51	77	59	45	77	54	40	76	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	79	79	73	79	79	68	78	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	79	79	77	79	79	72	79	77	66	78	73	57	75	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	57	59	59	49	59	59	44	59	55	39
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	50	59	59	43	59	52	37	59	46	32	55	40	29	49	36	38
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	60	50	62	53	44	62	47	39	62	41	34
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	62	52	62	53	44	62	46	38	60	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	71	73*	72*	59	73*	64	49	73*	56	42	73*	50	36
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	70	73*	73*	63	73*	64	50	73*	55	41	73*	48	34	69	42	29	63	37	25	56	33	34
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	62	71*	70*	53	70*	62	46
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	63	71*	69*	52	68*	60	44	58	52	37	51	46	32	46	41	28
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	46	59	56	40	59	49	35	59	43	31	53	38	41
			Exposed	59	59	59	59	59	59	59	59	59	59	59	55	59	59	50	59	59	45	59	59	42	59	50	35	58	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	56	62	57	47	62	49	41	62	42	35	57	37	31	50	33	41	44	29	36
			Exposed	62	62	62	62	62	60	62	62	54	62	59	48	62	53	44	62	48	40	62	44	37	57	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	69	73*	69	55	73*	59	45	73*	51	37	73*	45	31	67	40	27	60	35	24
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	70	56	73*	64	50	73*	58	44	73*	54	39	73*	45	32	66	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	69*	71*	71*	57	71*	64	48	63	56	41	55	50	35	49	44	30
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	63	71*	71*	56	71*	68*	50	63	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	62	53	62	62	45	62	54	39	62	47	33	56	41	29	50	36	39	44	32	35
			Exposed	62	62	62	62	62	57	62	62	51	62	62	46	62	59	42	62	54	38	62	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	62	51	65	57	47	65	48	40	63	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	65	65	56	65	61	50	65	54	45	65	49	41	65	45	37	62	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	70	74	74	61	74	69	54	74	58	43	74	50	36	71	43	30	64	38	26	56	33	23	50	29	31
			Exposed	74	74	69	74	72	59	74	66	51	74	59	45	74	54	40	74	49	35	73	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	68	74	72	55	70	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	74	74	74	74	74	72	74	74	66	74	73	57	74	68	50	69	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
70	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	44	51	51	39
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	43	51	51	37	51	46	32	51	40	29	49	36	38
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	56	53	44	56	47	39	56	41	34
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	52	56	53	44	56	46	38	56	40	33	53	35	29	47	31	38	41	41	34
		20-27	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	59	67*	64*	49	67*	56	42	67*	50	36
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	63*	67*	64*	50	67*	55	41	67*	48	34	67*	42	29	63*	37	25	56	33	34
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	63*	66*	66*	53	66*	63*	46
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	64*	66*	66*	52	66*	60*	44	59*	52	37	51	46	32	46	41	28
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	49	35	51	43	31	51	38	41
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	45	51	51	42	51	50	35	51	42	30	50	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	47	56	49	41	56	42	35	56	37	31	50	33	41	44	29	36
			Exposed	56	56	56	56	56	56	56	56	54	56	56	48	56	53	44	56	48	40	56	44	37	56	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	55	67*	59	45	67*	51	37	68*	45	31	67*	40	27	60	35	24
			Exposed	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	67*	56	67*	64*	50	67*	58	44	67*	54	39	67*	45	32	66*	39	27	57	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	57	66*	64*	48	63*	56	41	55	50	35	49	44	30
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	63*	66*	66*	56	66*	66*	50	66*	66*	50	63*	57	41	54	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	45	57	54	39	57	47	33	56	41	29	50	36	39	44	32	35
			Exposed	57	57	57	57	57	57	57	57	51	57	57	46	57	57	42	57	54	38	57	49	35	57	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	56	60	60	51	60	57	47	60	48	40	60	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	60	60	56	60	60	50	60	54	45	60	49	41	60	45	37	60	41	34	57	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	61	71*	69*	54	71*	58	43	71*	50	36	71*	43	30	64	38	26	56	33	23	50	29	31
			Exposed	71*	71*	69*	71*	71*	59	71*	66	51	71*	59	45	71*	54	40	71*	49	35	71*	45	31	65	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	68*	69*	69*	55	69*	62	46	60	54	39	53	47	33	46	42	28	41	37	25
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	66*	69*	69*	57	69*	68*	50	69*	61	45	63	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
80	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	39
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	37	45	45	32	45	40	29	45	36	38
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	47	39	49	41	34
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	46	38	49	40	33	49	35	29	47	31	38	41	41	34
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	59*	63*	63*	49	63*	56*	42	63*	50	36
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	50	63*	55*	41	63*	48	34	63*	42	29	63*	37	25	56*	33	34
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	53*	62*	62*	46
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	52	62*	60*	44	58*	53*	37	51	46	32	46	41	28
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	45	35	45	43	31	45	38	41
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	35	45	42	30	45	37	39	44	32	34	39	28	30	34	38	27
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	42	35	49	37	31	49	33	41	44	29	36
			Exposed	49	49	49	49	49	49	49	49	49	49	49	48	49	49	44	49	48	40	49	44	37	49	38	31	49	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	55*	63*	59*	45	63*	51	37	63*	45	31	62*	40	27	60*	35	24
			Exposed	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	63*	56*	63*	63*	50	63*	58*	44	63*	54	39	63*	45	32	63*	39	27	57*	34	23	50	29	31	44	39	27	39	35	24
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	57*	62*	62*	48	62*	56*	41	55*	50	35	49	44	30
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56*	62*	62*	50	62*	57*	41	54*	49	34	47	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	39	50	47	33	50	41	29	50	36	39	44	32	35
			Exposed	50	50	50	50	50	50	50	50	50	50	50	46	50	50	42	50	50	38	50	49	35	50	42	30	49	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	47	54	48	40	54	41	34	54	36	30	48	31	39	42	42	34	37	37	31
			Exposed	54	54	54	54	54	50	54	54	45	54	49	41	54	45	37	54	41	34	54	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	61*	66*	66*	54	66*	58	43	66*	50	36	65*	43	30	64*	38	26	56	33	23	50	29	31
			Exposed	66*	66*	66*	66*	66*	59	66*	66*	51	66*	59	45	66*	54	40	66*	49	35	66*	45	31	65*	38	26	55	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	55	65*	62*	46	60*	54	39	53	47	33	46	42	28	41	37	25
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	57	65*	65*	50	65*	62*	45	63*	56	41	53	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	32	40	40	29	40	36	38
		7-20	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	39	44	41	34
			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	38	44	40	33	44	35	29	44	31	38	41	41	34
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	49	59*	56*	42	59*	50*	36
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	50*	59*	55*	41	59*	48	34	59*	42	29	59*	37	25	56*	33	34
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	53*	59*	59*	46
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	52*	59*	59*	44	58*	52*	37	52*	46	32	46	41	28
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	31	40	38	41
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	37	39	40	32	34	39	28	30	34	38	27
		7-20	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	41	44	42	35	44	37	31	44	33	41	44	29	36
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	37	44	38	31	44	32	40	42	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	45	59*	45	31	59*	51*	37	59*	45	31	59*	40	27	58*	35	24
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	50*	59*	58*	44	59*	54*	39	59*	45	32	59*	39	27	57*	34	23	50*	29	31	44	39	27	39	35	24
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	48*	59*	56*	41	55*	50*	35	49*	44	30	59*	59*	57*	59*	44	30
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	56*	59*	59*	50*	59*	57*	41	54*	49*	34	47*	42	29	41	37	25	36	33	32	32	29	28
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	39	45	45	33	45	41	29	45	36	39	44	32	35
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	38	45	45	35	45	42	30	45	36	38	42	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	47	48	48	40	48	41	34	48	36	30	48	31	39	42	42	34	37	37	31
			Exposed	48	48	48	48	48	48	48	48	45	48	48	41	48	45	37	48	41	34	48	37	31	48	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	54	62*	58*	43	62*	50	36	62*	43	30	61*	38	26	56*	33	23	50	29	31
			Exposed	62*	62*	62*	62*	62*	59*	62*	62*	51	62*	59*	45	62*	54	40	62*	49	35	62*	45	31	62*	38	26	55*	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	62*	46	60*	54*	39	53*	47	33	46	42	28	41	37	25
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	57*	62*	62*	50	62*	61*	45	62*	56*	41	53*	48	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23
100	B	0-7	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
			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	32	36	36	29	36	36	38
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	33	40	35	29	40	31	38	40	41	34
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	49*	54*	54*	42	54*	50*	36
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	41	54*	48*	34	54*	42	29	54*	37	25	54*	33	34
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	62	69*	69*	51	69*	62	43
	C	0-7	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	35	36	36	31	36	36	41
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	30	36	36	39	36	32	34	36	28	30	34	38	27
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	37	31	40	33	41	40	29	36
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	38	31	40	32	40	40	42	35	37	37	31	33	33	27	29	29	24
		20-27	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	45*	54*	51*	37	54*	45*	31	54*	40	27	54*	35	24
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	44	54*	54*	39	54*	45*	32	54*	39	27	54*	34	23	50*	29	31	44	39	27	39	35	24
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	68*	69*	69*	57	69*	67*	48
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	68*	69*	69*	55	69*	64*	45	62	56	37	55	49	32	49	44	28
	D	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	33	40	40	29	40	36	39	40	32	35
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	35	40	40	30	40	36	38	40	31	33	37	41	29	33	36	26	29	32	23
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	41	34	44	36	30	44	31	39	42	42	34	37	37	31
			Exposed	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	41	34	44	37	31	44	32	39	41	41	34	36	35	29	31	31	26	42	27	23	37	24	20
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	54*	59*	58*	43	59*	50*	36	59*	43	30	59*	38	26	56*	33	23	50*	29	31
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	51*	59*	59*	45	59*	54*	40	59*	49	35	59*	45	31	59*	38	26	55*	33	34	48	28	29	42	37	26	37	33	23	33	29	20
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	55*	59*	59*	46	59*	54*	39	53*	47*	33	47*	42	28	41	37	25
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	57*	59*	59*	51*	59*	59*	45	59*	56*	41	53*	48*	33	46	41	28	40	35	24	35	31	30	31	41	26	41	37	23

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	78	78	78	78	78	78	78	78	76	78	78	72	78	78	67	78	77	59	78	73	51	78	66	39	73	52	33	67	42	28	55	35	25	45	31	22	38	27	19
			Exposed	78	78	67	78	76	57	78	71	48	78	67	41	76	58	35	73	51	32	69	45	29	56	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	78	78	78	78	78	78	78	78	74	78	77	69	78	73	61	78	68	51	77	61	43	69	45	34	59	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	78	73	60	78	67	48	75	56	40	70	47	34	66	39	31	58	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	76	70	79	72	66	79	62	47	75	47	35	69	37	29	61	32	24	51	28	21	44	25	18
			Exposed	79	79	75	79	75	69	79	70	60	79	65	49	78	54	41	75	46	35	71	40	31	61	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	75	79	79	71	79	73	59	75	66	46	67	53	36	53	42	31	42	35	26	35	31	23
			Exposed	79	79	78	79	79	74	79	78	69	79	75	62	77	70	52	74	66	45	69	56	39	54	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	78	78	70	78	78	64	78	75	54	78	70	46	78	65	39	75	57	34	72	49	32	62	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	78	65	39	75	54	34	70	46	30	65	40	27	55	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	78	76	67	78	70	55	78	64	45	73	53	38	69	44	33	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	69	44	33	62	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	79	79	77	79	77	73	79	74	67	79	69	56	79	61	46	77	52	39	74	45	34	67	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	79	61	46	76	50	37	72	41	32	68	35	28	61	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	79	79	79	79	79	76	79	79	72	79	77	67	79	73	59	76	69	50	73	64	44	63	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	79	73	59	76	68	48	71	59	41	66	50	35	54	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	78	76	58	78	71	48	78	67	41	76	58	35	72	50	32	68	43	29	61	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	72	50	32	67	42	28	58	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	78	67	49	75	56	40	70	46	34	65	39	31	57	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	57	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	79	75	69	79	70	60	79	64	49	77	53	40	74	45	34	70	38	30	66	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	74	45	34	69	37	29	63	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	79	79	74	79	78	69	79	74	61	77	70	52	73	64	44	69	55	38	62	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	73	64	44	67	53	37	57	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
10	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	59	67	67	51	67	66	39	67	52	33	67	42	28	55	35	25	45	31	22	38	27	19
			Exposed	67	67	67	67	67	57	67	67	48	67	67	41	67	58	35	67	51	32	67	45	29	56	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	68	51	68	61	43	68	45	34	59	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	68	68	60	68	67	48	68	56	40	68	47	34	66	39	31	58	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	76	70	77	72	66	77	62	47	75	47	35	69	37	29	61	32	24	51	28	21	44	25	18
			Exposed	77	77	75	77	75	69	77	70	60	77	65	49	77	54	41	75	46	35	71	40	31	61	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	78	71	78	73	59	75	66	46	67	53	36	53	42	31	42	35	26	35	31	23
			Exposed	78	78	78	78	78	74	78	78	69	78	75	62	77	70	52	74	66	45	69	56	39	54	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	67	67	67	67	67	64	67	67	54	67	67	46	67	65	39	67	57	34	67	49	32	62	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	67	65	39	67	54	34	67	46	30	65	40	27	55	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	68	68	67	68	68	55	68	64	45	68	53	38	68	44	33	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	68	44	33	62	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	77	77	77	77	77	73	77	74	67	77	69	56	77	61	46	77	52	39	74	45	34	67	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	77	61	46	76	50	37	72	41	32	68	35	28	61	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	78	78	78	78	78	76	78	78	72	78	77	67	78	73	59	76	69	50	73	64	44	63	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	78	73	59	76	68	48	71	59	41	66	50	35	54	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	67	67	58	67	67	48	67	67	41	67	58	35	67	50	32	67	43	29	61	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	67	50	32	67	42	28	58	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	68	67	49	68	56	40	68	46	34	65	39	31	57	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	57	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	77	75	69	77	70	60	77	64	49	77	53	40	74	45	34	70	38	30	66	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	74	45	34	69	37	29	63	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	79	79	74	79	78	69	79	74	61	77	70	52	73	64	44	69	55	38	62	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	73	64	44	67	53	37	57	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
20	B	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	39	54	52	33	54	42	28	54	35	25	45	31	22	38	27	19
			Exposed	54	54	54	54	54	54	54	54	48	54	54	41	54	54	35	54	51	32	54	45	29	54	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	43	54	45	34	54	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	54	54	54	54	54	48	54	54	40	54	47	34	54	39	31	54	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	66	71*	62	47	71*	47	35	69	37	29	61	32	24	51	28	21	44	25	18
			Exposed	71*	71*	71*	71*	71*	69	71*	70*	60	71*	65	49	71*	54	41	71*	46	35	71*	40	31	61	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	59	70*	67*	46	68*	53	36	53	42	31	42	35	26	35	31	23
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	62	70*	70*	52	70*	66	45	69*	56	39	54	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	46	54	54	39	54	54	34	54	49	32	54	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	54	54	39	54	54	34	54	46	30	54	40	27	54	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	54	54	54	54	54	54	54	54	45	54	53	38	54	44	33	54	38	30	54	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	54	44	33	54	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	71*	71*	71*	71*	71*	71*	71*	71*	67	71*	69	56	71*	61	46	71*	52	39	71*	45	34	67	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	71*	61	46	71*	50	37	71*	41	32	68	35	28	61	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	59	70*	69*	50	70*	64	44	63	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	70*	70*	59	70*	68*	48	70*	59	41	66	50	35	54	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	54	54	54	54	54	48	54	54	41	54	54	35	54	50	32	54	43	29	54	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	54	50	32	54	42	28	54	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	54	54	49	54	54	40	54	46	34	54	39	31	54	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	54	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	70	70	69	70	70	60	70	64	49	70	53	40	70	45	34	70	38	30	66	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	70	45	34	69	37	29	63	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	72*	72*	72*	72*	72*	70*	72*	72*	61	72*	70*	52	72*	64	44	69	55	38	62	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	72*	64	44	67	53	37	57	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	51	52	52	39	52	52	33	52	42	28	52	35	25	45	31	22	38	27	19
			Exposed	52	52	52	52	52	52	52	52	48	52	52	41	52	52	35	52	51	32	52	45	29	52	35	25	44	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	43	54	45	34	54	35	29	49	30	25	41	26	22	35	23	19	31	20	17
			Exposed	54	54	54	54	54	48	54	54	40	54	47	34	54	39	31	54	34	28	52	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	47	62*	47	35	62*	37	29	61*	32	24	51	28	21	44	25	18
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	60*	62*	62*	49	62*	54	41	62*	46	35	62*	40	31	61*	32	25	50	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	59*	64*	64*	46	64*	53	36	53	42	31	42	35	26	35	31	23
			Exposed	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	62*	64*	64*	52	64*	64*	45	64*	57*	39	55*	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	46	52	52	39	52	52	34	52	49	32	52	39	27	49	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	52	52	39	52	52	34	52	46	30	52	40	27	52	35	25	48	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	54	54	54	54	54	54	54	54	45	54	53	38	54	44	33	54	38	30	54	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	54	44	33	54	36	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56	62*	61*	46	62*	52	39	62*	45	34	62*	34	27	55	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	62*	61*	46	62*	50	37	62*	41	32	62*	35	28	61*	32	25	54	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	64*	59*	64*	64*	50	64*	64*	44	63*	48	34	46	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	64*	64*	59*	64*	64*	48	64*	59*	41	64*	50	35	55*	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	54	54	54	54	54	48	54	54	41	54	54	35	54	50	32	54	43	29	54	38	26	48	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	54	50	32	54	42	28	54	36	25	49	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	54	54	49	54	54	40	54	46	34	54	39	31	54	34	28	51	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	54	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	64*	64*	64*	64*	64*	60	64*	64*	49	64*	53	40	64*	45	34	64*	38	30	64*	34	27	54	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	64*	45	34	64*	37	29	63*	33	25	55	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	61*	65*	65*	52	65*	64*	44	65*	55	38	62*	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	65*	64*	44	65*	53	37	58*	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
40	B	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	39	43	43	33	43	42	28	43	35	25	43	31	22	38	27	19
			Exposed	43	43	43	43	43	43	43	43	43	43	43	41	43	43	35	43	43	32	43	43	29	43	35	25	43	30	21	36	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	45	34	46	35	29	46	30	25	41	26	22	35	23	19	31	20	17
			Exposed	46	46	46	46	46	46	46	46	40	46	46	34	46	39	31	46	34	28	46	31	26	42	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	47	56*	47	35	56*	37	29	56*	32	24	51*	28	21	44	25	18
			Exposed	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	49*	56*	54*	41	56*	46	35	56*	40	31	56*	32	25	50*	27	20	42	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	47*	59*	53*	36	53*	42	31	42	35	26	35	31	23
			Exposed	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	52*	59*	59*	45	59*	56*	39	54*	43	31	41	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	34	43	43	32	43	39	27	43	32	23	40	28	20	33	24	17	29	21	23	26	19	20
			Exposed	43	43	39	43	43	34	43	43	30	43	40	27	43	35	25	43	32	22	42	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	46	46	46	46	46	46	46	46	45	46	46	38	46	44	33	46	38	30	46	34	28	46	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	46	44	33	46	36	30	46	32	27	46	29	24	42	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	46	56*	52*	39	56*	45	34	56*	34	27	55*	29	22	46	25	18	39	22	15	33	20	13	30	17	18
			Exposed	56*	56*	46	56*	50*	37	56*	41	32	56*	35	28	56*	32	25	54*	29	22	48	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	59*	50*	59*	59*	50*	59*	59*	44	59*	48*	34	47*	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	59*	59*	59*	59*	59*	49*	59*	59*	41	59*	50*	35	54*	43	31	45	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	46	46	46	46	46	46	46	46	41	46	46	35	46	46	32	46	43	29	46	38	26	46	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	46	46	32	46	42	28	46	36	25	46	32	23	43	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	49	49	49	49	49	40	49	46	34	49	39	31	49	34	28	49	31	25	45	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	49	34	28	49	30	25	43	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	59*	59*	59*	59*	59*	59*	59*	59*	49	59*	53*	40	59*	45	34	59*	38	30	59*	34	27	54*	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	59*	45	34	59*	37	29	59*	33	25	55*	29	22	49	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	60*	52*	60*	60*	44	60*	55*	38	60*	47	34	45	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	60*	60*	44	60*	53*	37	57*	44	32	47	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
50	B	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	28	35	35	25	35	31	22	35	27	19
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	29	35	35	25	35	30	21	35	26	18	31	23	24	27	20	21	24	18	19
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	35	29	38	30	25	38	26	22	35	23	19	31	20	17
			Exposed	38	38	38	38	38	38	38	38	38	38	38	34	38	38	31	38	34	28	38	31	26	38	26	22	35	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	49*	47*	35	49*	37	29	49*	32	24	49*	28	21	44*	25	18
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	41	49*	46*	35	49*	40	31	49*	32	25	49*	27	20	42*	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	46*	54*	53*	36	53*	42*	31	42*	35	26	35	31	23
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	52*	54*	54*	45*	54*	54*	39	54*	43*	31	41*	34	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	32	35	35	27	35	32	23	35	28	20	33	24	17	29	21	23	26	19	20
			Exposed	35	35	35	35	35	34	35	35	30	35	35	27	35	35	25	35	32	22	35	29	21	34	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	33	38	38	30	38	34	28	38	28	23	38	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	38	38	33	38	36	30	38	32	27	38	29	24	38	26	22	37	24	20	34	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	46*	49*	49*	39	49*	45*	34	49*	34	27	49*	29	22	46*	25	18	39	22	15	33	20	13	30	17	18
			Exposed	49*	49*	46*	49*	49*	37	49*	41	32	49*	35	28	49*	32	25	49*	29	22	48*	27	19	39	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	50*	54*	54*	44*	54*	48*	34	46*	38	28	36	32	24	31	28	20	27	25	17	24	22	15
			Exposed	54*	54*	54*	54*	54*	48*	54*	54*	41*	54*	50*	35	54*	43*	31	45*	37	28	39	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	39	29	39	38	26	39	32	22	38	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	39	39	32	39	39	28	39	36	25	39	32	23	39	29	21	37	27	19	34	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	42	42	42	42	42	40	42	42	34	42	39	31	42	34	28	42	31	25	42	28	23	37	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	42	34	28	42	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	52*	52*	52*	52*	52*	52*	52*	52*	49*	52*	52*	40	52*	45*	34	52*	38	30	52*	34	27	52*	29	22	44	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	52*	45*	34	52*	37	29	52*	33	25	52*	29	22	49*	27	20	43	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	56*	52*	56*	56*	44*	56*	55*	38	56*	47*	34	45*	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	56*	56*	44*	56*	53*	37	56*	45*	32	47*	38	28	39	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

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ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	30	22	30	27	19
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	25	30	30	21	30	26	18	30	23	24	27	20	21	24	18	19
		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	29	32	30	25	32	26	22	32	23	19	31	20	17
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	31	26	32	26	22	32	23	19	30	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	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*	35	43*	37*	29	43*	32	24	43*	28	21	43*	25	18
			Exposed	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	41*	43*	43*	35	43*	40*	31	43*	32	25	43*	27	20	42*	24	17	35	21	14	31	18	19	28	24	17
		27-45	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	46*	49*	49*	36*	47*	42*	31	42*	35*	26	35*	31	23
			Exposed	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	45*	50*	50*	39*	50*	43*	31	41*	35*	26	33	30	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	23	30	28	20	30	24	17	29	21	23	26	19	20
			Exposed	30	30	30	30	30	30	30	30	30	30	27	30	30	25	30	30	22	30	29	21	30	25	17	29	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	28	23	32	24	20	32	21	17	28	18	23	25	24	20	22	22	18
			Exposed	32	32	32	32	32	30	32	32	27	32	29	24	32	26	22	32	24	20	32	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	43*	39*	43*	43*	34	43*	34	27	43*	29	22	43*	25	18	39*	22	15	33	20	13	30	17	18
			Exposed	43*	43*	43*	43*	43*	37*	43*	41*	32	43*	35	28	43*	32	25	43*	29	22	43*	27	19	39*	22	16	33	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	44*	48*	48*	34	45*	38*	28	36*	32	24	31	28	20	27	25	17	24	22	15
			Exposed	50*	50*	50*	50*	50*	48*	50*	50*	41*	50*	50*	35*	50*	43*	31	45*	37*	28	39*	33	25	31	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	26	33	32	22	33	27	19	32	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	33	33	32	33	33	28	33	33	25	33	32	23	33	29	21	33	27	19	33	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	36	36	36	36	36	36	36	36	34	36	36	31	36	34	28	36	31	25	36	28	23	36	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	36	34	28	36	30	25	36	27	22	36	24	20	34	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	40*	46*	45*	34	46*	38	30	46*	34	27	46*	29	22	44*	25	18	37	21	15	32	19	19	28	16	17	25	22	15
			Exposed	46*	45*	34	46*	37	29	46*	33	25	46*	29	22	46*	27	20	43*	24	17	39	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	52*	53*	53*	44*	53*	53*	38*	52*	47*	34	45*	36	27	35	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	53*	53*	44*	53*	53*	37	53*	44*	32	47*	38*	28	39*	33	25	34	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
70	B	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	22	26	26	19
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	21	26	26	18	26	23	24	26	20	21	24	18	19
		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	28	28	28	28	28	28	28	25	28	26	22	28	23	19	28	20	17
			Exposed	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	26	22	28	23	19	28	20	24	26	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	35*	37*	37*	29	37*	32*	24	37*	28	21	37*	25	18
			Exposed	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	35*	37*	37*	31	37*	32*	25	37*	27	20	37*	24	17	35*	21	14	31	18	19	28	24	17
		27-45	Interior	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	44*	44*	36*	42*	42*	31*	40*	35*	26	35*	31*	23
			Exposed	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	45*	46*	46*	39*	46*	43*	31*	41*	34*	26	33*	30*	22	29	26	18	26	23	16	23	20	21
	C	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	20	26	24	17	26	21	23	26	19	20
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	22	26	26	21	26	25	17	26	21	23	25	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		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	28	23	28	24	20	28	21	17	28	18	23	25	24	20	22	22	18
			Exposed	28	28	28	28	28	28	28	28	27	28	28	24	28	26	22	28	24	20	28	22	18	28	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	34*	37*	34*	27	37*	29	22	37*	25	18	37*	22	15	33*	20	13	30	17	18
			Exposed	37*	37*	37*	37*	37*	37*	37*	37*	32*	37*	35*	28	37*	32*	25	37*	29	22	37*	27	19	37*	22	16	33*	19	20	28	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	46*	45*	45*	44*	43*	43*	34*	41*	38*	28	36*	32*	24	31*	28	20	27	25	17	24	22	15
			Exposed	46*	46*	46*	46*	46*	46*	46*	46*	41*	46*	46*	35*	46*	43*	31*	45*	37*	28	39*	33*	25	32*	28	20	27	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	22	28	27	19	28	23	16	28	20	22	25	18	19	22	24	~~17~~
			Exposed	28	28	28	28	28	28	28	28	25	28	28	23	28	28	21	28	27	19	28	24	17	28	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	28	23	31	24	20	31	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	31	31	28	31	30	25	31	27	22	31	24	20	31	22	18	31	20	17	28	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	40*	41*	41*	34	41*	38*	30	41*	34	27	41*	29	22	41*	25	18	37*	21	15	32	19	19	28	16	17	25	22	15
			Exposed	41*	41*	34	41*	37*	29	41*	33	25	41*	29	22	41*	27	20	41*	24	17	39*	22	15	32	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	44*	48*	48*	38*	46*	46*	34*	44*	36*	27	35*	31	23	30	27	19	26	23	16	23	21	21	20	18	18
			Exposed	49*	49*	44*	49*	49*	37*	49*	44*	32	47*	38*	28	39*	34*	25	34*	31	22	31	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~
80	B	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	24	22	20	21	22	18	19
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	20	17
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	20	24	24	17	21	23	23	19	20	20	~~17~~
		20-27	Interior	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	29*	33*	32*	24	33*	28*	21	33*	25	18
			Exposed	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	31*	33*	32*	25	33*	27	20	33*	24	17	33*	21	14	31*	18	19	28*	24	17
		27-45	Interior	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	41*	41*	41*	40*	40*	36*	38*	38*	31*	37*	35*	27*	35*	31*	23
			Exposed	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	39*	42*	42*	31*	41*	34*	26	33*	30*	22	29*	26	18	26	23	16	23	20	21
	C	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	17	22	21	23	22	19	20
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	17	22	21	23	22	18	19	22	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	21	17	24	18	23	24	24	20	22	22	18
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	19	23	24	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	27	33*	29*	22	33*	25	18	33*	22	15	32*	20	13	30*	17	18
			Exposed	33*	33*	33*	33*	33*	33*	33*	33*	32*	33*	33*	28*	33*	32*	25	33*	29*	22	33*	27	19	33*	22	16	33*	19	20	28*	17	17	25	22	15	22	19	~~13~~	19	17	~~12~~
		27-45	Interior	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	42*	41*	41*	41*	39*	39*	34*	37*	37*	28*	35*	32*	24	31*	28*	20	27*	25	17	24	22	15
			Exposed	42*	42*	42*	42*	42*	42*	42*	42*	41*	42*	42*	35*	42*	42*	31*	42*	37*	28*	39*	33*	25	31*	28*	20	27*	24	17	23	21	14	20	18	18	18	24	16	24	22	~~14~~
	D	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	22	25	25	19	25	23	16	25	20	22	25	18	19	22	24	~~17~~
			Exposed	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	25	19	25	24	17	25	21	22	24	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	24	20	27	20	17	27	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	27	27	27	27	27	25	27	27	22	27	24	20	27	22	18	27	20	17	27	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	36*	34*	36*	36*	30	36*	34*	27	36*	29	22	36*	25	18	36*	21	15	32*	19	19	28	16	17	25	22	15
			Exposed	36*	36*	34*	36*	36*	29	36*	33*	25	36*	29	22	36*	27	20	36*	24	17	36*	22	15	32*	19	19	28	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	45*	44*	43*	43*	38*	42*	42*	34*	40*	36*	27	35*	31*	23	30*	27	19	26	23	16	23	21	21	20	18	18
			Exposed	45*	45*	44*	45*	45*	37*	45*	44*	32*	45*	38*	28	39*	33*	25	34*	31*	22	31*	28	20	26	24	16	23	20	21	20	18	18	17	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	24	20	20	21	20	18	19
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	20	17
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	20	24	22	17	21	22	23	19	20	20	~~17~~
		20-27	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	44*	50*	48*	37	50*	42*	31	50*	37	27
			Exposed	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	46*	50*	48*	37	50*	41*	31	50*	36	25	50*	31	21	47*	28	19	42*	24	17
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	46*	51*	51*	40*	49*	47*	34
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	39*	50*	45*	33	44*	39*	28	39*	35	24	34	31	21
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	20	23	20	19	20
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	20	23	20	18	19	20	24	~~17~~	19	21	~~15~~	17	19	~~13~~
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	21	17	22	18	23	22	24	20	22	22	18
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	19	23	22	24	20	21	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	41*	50*	44*	33	50*	38*	28	50*	34	23	49*	30	20	45*	26	18
			Exposed	50*	50*	50*	50*	50*	50*	50*	50*	48*	50*	50*	42*	50*	48*	37	50*	44*	33	50*	40*	29	50*	34	24	50*	29	20	43*	25	17	37	22	15	33	19	~~13~~	29	17	~~12~~
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	42*	50*	48*	36*	47*	42*	30	41*	37*	26	37*	33	23
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	47*	51*	51*	42*	51*	50*	38*	47*	43*	31	41*	37*	26	35	32	22	31	28	18	27	24	16	24	22	~~14~~
	D	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	16	22	20	22	22	18	19	22	24	~~17~~
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	22	17	22	21	22	22	18	19	21	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	20	17	24	18	22	24	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	20	17	24	18	23	24	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	33*	30*	33*	33*	27	33*	29*	22	33*	25	18	33*	21	15	32*	19	19	28*	16	17	25	22	15
			Exposed	33*	33*	33*	33*	33*	29*	33*	33*	25	33*	29*	22	33*	27	20	33*	24	17	33*	22	15	32*	19	19	28*	24	17	24	21	~~14~~	21	18	~~13~~	18	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	54*	51*	54*	54*	41*	52*	47*	34	45*	41*	29	40*	35	25	35	31	21	31	28	18
			Exposed	54*	54*	54*	54*	54*	54*	54*	54*	48*	54*	54*	43*	54*	51*	38	52*	46*	34	47*	42*	31	40*	36	25	34	31	21	30	27	18	26	23	15	23	20	~~13~~	20	18	~~11~~
100	B	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	24	18	18	21	18	18	19
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	24	20	17	21	20	23	19	20	20	~~17~~
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	31	40*	37*	27
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	31	40*	36*	25	40*	31	21	40*	28	19	40*	24	17
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	46*	48*	48*	40*	46*	46*	35*
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	49*	49*	39*	49*	45*	33*	44*	39*	28	39*	35*	24	34*	31	21
	C	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	23	18	18	20
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	23	18	18	19	18	24	~~17~~	18	21	~~15~~	17	19	~~13~~
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	18	23	20	24	20	20	22	18
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	19	23	20	24	20	20	21	17	18	18	~~15~~	24	~~16~~	~~13~~	22	~~14~~	~~12~~
		20-27	Interior	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	33	40*	38*	28	40*	34*	23	40*	30	20	40*	26	18
			Exposed	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	40*	37*	40*	40*	33	40*	40*	29	40*	34*	24	40*	29	20	40*	25	17	37*	22	15	33	19	~~13~~	29	17	~~12~~
		27-45	Interior	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	48*	48*	42*	46*	46*	36*	44*	42*	30	41*	37*	26	37*	33*	23
			Exposed	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	49*	47*	49*	49*	42*	49*	49*	38*	47*	43*	31	41*	36*	26	35*	32*	22	31	28	18	27	24	16	24	22	~~14~~
	D	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	19	20	20	16	20	20	22	20	18	19	20	24	~~17~~
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	22	20	18	19	20	23	~~16~~	18	20	~~14~~	24	18	~~13~~	22	~~16~~	~~11~~
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	20	17	22	18	22	22	23	19	21	21	~~17~~	18	18	~~15~~
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	18	22	20	17	22	18	23	22	24	19	20	20	~~17~~	18	17	~~14~~	23	~~15~~	~~13~~	21	~~13~~	~~11~~	18	~~12~~	~~10~~
		20-27	Interior	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	50*	45*	50*	50*	40*	50*	43*	33	50*	37	27	50*	32	22	48*	28	19	42*	25	17	38*	22	15
			Exposed	50*	50*	50*	50*	50*	44*	50*	49*	38*	50*	44*	34	50*	40*	30	50*	37	26	50*	34	24	49*	28	19	42*	24	17	36	21	~~14~~	31	18	~~13~~	28	~~16~~	~~11~~	25	~~14~~	~~10~~
		27-45	Interior	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	51*	41*	49*	47*	34	45*	40*	29	39*	36*	25	35	31	21	31	28	18
			Exposed	51*	51*	51*	51*	51*	51*	51*	51*	48*	51*	51*	42*	51*	51*	38*	51*	46*	34	47*	42*	30	40*	36*	25	34	31	21	30	27	18	26	23	15	23	20	~~13~~	20	18	~~11~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
0	B	0-7	Interior	98	98	98	98	98	98	98	98	95	98	98	91	98	98	87	98	96	83	98	92	80	98	85	73	92	80	64	86	75	55	81	68	48	77	60	43	72	53	38
			Exposed	98	98	86	98	95	82	98	90	78	98	86	75	96	83	69	91	79	63	88	76	58	81	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	98	98	98	98	98	98	98	98	92	98	96	87	98	91	83	98	87	79	96	83	76	88	77	67	83	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	98	91	83	98	86	78	93	82	74	89	78	68	86	74	61	83	68	56	80	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	93	98	95	89	98	91	85	98	84	78	94	78	70	88	71	57	84	62	48	79	55	41	76	49	35
			Exposed	98	98	93	98	94	88	98	89	83	98	85	79	98	81	75	93	77	69	90	74	61	84	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	98	99	99	94	99	99	90	99	92	83	93	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	99	99	98	99	99	92	99	98	88	99	93	84	97	89	80	92	85	77	88	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	98	98	89	98	98	85	98	93	81	98	89	77	98	85	73	95	82	68	91	79	62	84	72	52	79	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	98	85	73	93	81	67	89	77	59	85	73	54	81	68	49	78	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	30	34	37	26
		7-20	Interior	98	95	86	98	89	81	98	84	77	92	80	72	88	77	66	85	72	60	82	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	88	76	66	84	71	58	81	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	98	98	97	98	98	91	98	92	86	98	88	82	98	84	78	97	80	74	92	77	68	86	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	98	83	77	95	79	72	91	75	64	87	69	55	84	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	99	99	99	99	99	96	99	99	91	99	96	87	99	92	83	96	88	79	91	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	99	92	83	95	87	78	89	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	98	95	82	98	90	78	98	86	74	95	82	69	91	79	62	87	76	57	84	72	52	78	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	91	79	62	86	75	56	82	70	50	79	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	98	86	79	94	82	74	89	77	68	85	73	61	82	67	55	79	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	82	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	98	94	88	98	89	83	98	84	79	97	80	75	93	77	68	89	73	59	86	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	92	77	68	88	71	57	85	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	99	99	93	99	98	88	99	93	84	97	89	80	92	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	91	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	22
10	B	0-7	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	83	87	87	80	87	85	73	87	80	64	86	75	55	81	68	48	77	60	43	72	53	38
			Exposed	87	87	86	87	87	82	87	87	78	87	86	75	87	83	69	87	79	63	87	76	58	81	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	83	87	87	79	87	83	76	87	77	67	83	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	87	87	83	87	86	78	87	82	74	87	78	68	86	74	61	83	68	56	80	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	89	95	91	85	95	84	78	94	78	70	88	71	57	84	62	48	79	55	41	76	49	35
			Exposed	95	95	93	95	94	88	95	89	83	95	85	79	95	81	75	93	77	69	90	74	61	84	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	94	98	98	90	98	92	83	93	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	98	98	98	98	98	92	98	98	88	98	93	84	97	89	80	92	85	77	88	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	87	87	87	87	87	85	87	87	81	87	87	77	87	85	73	87	82	68	87	79	62	84	72	52	79	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	87	85	73	87	81	67	87	77	59	85	73	54	81	68	49	78	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	30	34	37	26
		7-20	Interior	87	87	86	87	87	81	87	84	77	87	80	72	87	77	66	85	72	60	82	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	87	76	66	84	71	58	81	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	95	95	95	95	95	91	95	92	86	95	88	82	95	84	78	95	80	74	92	77	68	86	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	95	83	77	95	79	72	91	75	64	87	69	55	84	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	98	98	98	98	98	96	98	98	91	98	96	87	98	92	83	96	88	79	91	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	98	92	83	95	87	78	89	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	87	87	82	87	87	78	87	86	74	87	82	69	87	79	62	87	76	57	84	72	52	78	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	87	79	62	86	75	56	82	70	50	79	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	87	86	79	87	82	74	87	77	68	85	73	61	82	67	55	79	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	82	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	96	94	88	96	89	83	96	84	79	96	80	75	93	77	68	89	73	59	86	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	92	77	68	88	71	57	85	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	98	98	93	98	98	88	98	93	84	97	89	80	92	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	91	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	22
20	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	64	77	75	55	77	68	48	77	60	43	72	53	38			
			Exposed	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	77	63	77	76	58	77	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	77	67	78	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	78	78	78	78	78	78	78	78	74	78	78	68	78	74	61	78	68	56	78	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	84	78	88	78	70	88	71	57	84	62	48	79	55	41	76	49	35
			Exposed	88	88	88	88	88	88	88	88	83	88	85	79	88	81	75	88	77	69	88	74	61	84	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	91	91	83	91	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	91	91	91	91	91	91	91	91	88	91	91	84	91	89	80	91	85	77	88	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	62	77	72	52	77	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	77	77	73	77	77	67	77	77	59	77	73	54	77	68	49	77	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	30	34	37	26
		7-20	Interior	78	78	78	78	78	78	78	78	77	78	78	72	78	77	66	78	72	60	78	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	78	76	66	78	71	58	78	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	88	88	88	88	88	88	88	88	86	88	88	82	88	84	78	88	80	74	88	77	68	86	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	88	83	77	88	79	72	88	75	64	87	69	55	84	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	87	91	91	83	91	88	79	91	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	91	91	83	91	87	78	89	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	77	77	77	77	77	77	77	77	74	77	77	69	77	77	62	77	76	57	77	72	52	77	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	77	77	62	77	75	56	77	70	50	77	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	78	78	78	78	78	74	78	77	68	78	73	61	78	67	55	78	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	78	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	89	89	88	89	89	83	89	84	79	89	80	75	89	77	68	89	73	59	86	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	89	77	68	88	71	57	85	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	93	93	93	93	93	88	93	93	84	93	89	80	92	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	91	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	22

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
30	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	64	77	75	55	77	68	48	77	60	43	72	53	38
			Exposed	77	77	77	77	77	77	77	77	77	77	77	75	77	77	69	77	77	63	77	76	58	77	69	49	76	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	77	67	78	69	56	78	59	49	74	52	43	68	46	38	62	40	33
			Exposed	78	78	78	78	78	78	78	78	74	78	78	68	78	74	61	78	68	56	78	62	51	75	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	78	83	78	70	83	71	57	83	62	48	79	55	41	76	49	35
			Exposed	83	83	83	83	83	83	83	83	83	83	83	79	83	81	75	83	77	69	83	74	61	83	63	49	79	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	86	77	86	80	70	80	75	60	76	69	52	69	61	45
			Exposed	86	86	86	86	86	86	86	86	86	86	86	84	86	86	80	86	85	77	86	82	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68	77	77	62	77	72	52	77	64	45	73	55	39	66	48	34	58	42	30	51	38	40
			Exposed	77	77	73	77	77	67	77	77	59	77	73	54	77	68	49	77	63	44	75	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	78	78	78	78	78	78	78	78	77	78	78	72	78	77	66	78	72	60	78	67	55	77	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	78	76	66	78	71	58	78	64	52	77	57	47	74	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	82	83	83	78	83	80	74	83	77	68	83	68	53	81	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	83	83	77	83	79	72	83	75	64	83	69	55	83	63	48	81	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	86	79	86	84	76	84	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	86	86	83	86	86	78	86	83	75	85	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	77	77	77	77	77	77	77	77	74	77	77	69	77	77	62	77	76	57	77	72	52	77	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	77	77	62	77	75	56	77	70	50	77	64	45	75	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	78	78	78	78	78	74	78	77	68	78	73	61	78	67	55	78	61	50	76	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	78	67	55	78	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	84	84	84	84	84	83	84	84	79	84	80	75	84	77	68	84	73	59	84	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	84	77	68	84	71	57	84	64	50	81	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	88	88	88	88	88	88	88	88	84	88	88	80	88	85	76	87	81	72	83	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	88	84	76	86	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
40	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	64	71	71	55	71	68	48	71	60	43	71	53	38
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	63	71	71	58	71	69	49	71	59	42	69	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	67	73	69	56	73	59	49	73	52	43	68	46	38	62	40	33
			Exposed	73	73	73	73	73	73	73	73	73	73	73	68	73	73	61	73	68	56	73	62	51	73	52	43	68	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	70	78	71	57	78	62	48	78	55	41	76	49	35
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	77	69	78	74	61	78	63	49	78	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	80	70	80	75	60	76	69	52	69	61	45
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	77	81	81	73	81	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	62	71	71	52	71	64	45	71	55	39	66	48	34	58	42	30	51	38	40
			Exposed	71	71	71	71	71	67	71	71	59	71	71	54	71	68	49	71	63	44	71	57	41	67	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	72	73	73	66	73	72	60	73	67	55	73	56	46	71	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	73	73	66	73	71	58	73	64	52	73	57	47	73	52	43	70	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	77	68	78	68	53	78	58	44	77	50	36	72	44	31	66	39	26	58	34	24
			Exposed	78	78	77	78	78	72	78	75	64	78	69	55	78	63	48	78	57	43	78	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	79	81	81	76	81	78	67	78	72	55	70	63	47	61	55	40	54	48	34	48	43	30
			Exposed	81	81	81	81	81	78	81	81	75	81	79	69	81	76	61	77	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	69	73	73	62	73	73	57	73	72	52	73	62	44	71	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	73	73	62	73	73	56	73	70	50	73	64	45	73	58	41	71	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	75	75	75	75	75	74	75	75	68	75	73	61	75	67	55	75	61	50	75	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	75	67	55	75	59	49	75	53	44	71	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	80	80	80	80	80	80	80	80	79	80	80	75	80	77	68	80	73	59	80	67	53	80	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	80	77	68	80	71	57	80	64	50	80	58	44	78	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	80	84	84	76	83	81	72	82	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	84	84	76	84	80	71	82	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
50	B	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	55	64	64	48	64	60	43	64	53	38
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	58	64	64	49	64	59	42	64	51	36	61	45	32	54	39	42	48	35	37
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	56	67	59	49	67	52	43	67	46	38	62	40	33
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	56	67	62	51	67	52	43	67	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	71	57	75	62	48	75	55	41	75	49	35
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	74	61	75	63	49	75	54	40	74	47	33	68	41	28	61	36	25	54	32	33
		27-45	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	76	76	76	70	76	75	60	75	69	52	69	61	45
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	76	61	75	68	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	62	64	64	52	64	64	45	64	55	39	64	48	34	58	42	30	51	38	40
			Exposed	64	64	64	64	64	64	64	64	59	64	64	54	64	64	49	64	63	44	64	57	41	64	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	67	60	67	67	55	67	56	46	67	48	40	64	42	34	55	36	30	49	32	40	43	43	36
			Exposed	67	67	66	67	67	58	67	64	52	67	57	47	67	52	43	67	47	39	66	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	68	75	68	53	75	58	44	75	50	36	72	44	31	66	39	26	58	34	24
			Exposed	75	75	75	75	75	72	75	75	64	75	69	55	75	63	48	75	57	43	75	52	38	72	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	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	76	76	76	70	76	75	60	75	69	52	69	61	45
			Exposed	76	76	76	76	76	76	76	76	75	76	76	69	76	76	61	76	71	54	73	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	57	67	67	52	67	62	44	67	53	38	63	46	33	55	40	43	49	35	38	43	32	34
			Exposed	67	67	62	67	67	56	67	67	50	67	64	45	67	58	41	67	53	37	66	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	70	70	70	70	70	70	70	70	68	70	70	61	70	67	55	70	61	50	70	56	46	70	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	70	67	55	70	59	49	70	53	44	70	48	40	67	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	75	77	77	68	77	73	59	77	67	53	77	57	43	76	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	77	77	68	77	71	57	77	64	50	77	58	44	77	53	39	75	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	78	72	78	78	67	77	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	78	78	76	78	78	71	78	76	63	78	72	55	74	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
60	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	48	58	58	43	58	53	38
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	58	42	58	51	36	58	45	32	54	39	42	48	35	37
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	56	61	59	49	61	52	43	61	46	38	61	40	33
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	56	61	61	51	61	52	43	61	45	37	59	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	70*	72*	71*	57	72*	62	48	72*	55	41	72*	49	35
			Exposed	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	69	72*	72*	61	72*	63	49	72*	54	40	72*	47	33	68	41	28	61	36	25	54	32	33
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	60	70*	69*	52	69*	61	45
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	61	70*	68*	51	66	59	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	45	58	55	39	58	48	34	58	42	30	51	38	40
			Exposed	58	58	58	58	58	58	58	58	58	58	58	54	58	58	49	58	58	44	58	57	41	58	48	34	57	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	55	61	56	46	61	48	40	61	42	34	55	36	30	49	32	40	43	43	36
			Exposed	61	61	61	61	61	58	61	61	52	61	57	47	61	52	43	61	47	39	61	43	36	56	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	72*	68	72*	68	53	72*	58	44	72*	50	36	72*	44	31	66	39	26	58	34	24
			Exposed	72*	72*	72*	72*	72*	72*	72*	72*	64	72*	69	55	72*	63	48	72*	57	43	72*	52	38	72*	44	31	65	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	55	70*	63	47	61	55	40	54	48	34	48	43	30
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	61	70*	70*	54	70*	66	49	62	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	62	52	62	62	44	62	53	38	62	46	33	55	40	43	49	35	38	43	32	34
			Exposed	62	62	62	62	62	56	62	62	50	62	62	45	62	58	41	62	53	37	62	48	34	56	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	61	64	64	55	64	61	50	64	56	46	64	47	39	62	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	64	64	55	64	59	49	64	53	44	64	48	40	64	44	36	61	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	68	73	73	59	73	67	53	73	57	43	73	49	35	70	42	29	63	37	25	55	32	34	49	43	30
			Exposed	73	73	68	73	71	57	73	64	50	73	58	44	73	53	39	73	48	34	72	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72	73*	73*	67	73*	70	54	68	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	73*	73*	73*	73*	73*	71	73*	73*	63	73*	72	55	73*	66	49	68	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
70	B	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	50	38
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	42	50	50	36	50	45	32	50	39	42	48	35	37
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	52	43	54	46	38	54	40	33
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	52	43	54	45	37	54	39	32	52	34	42	46	30	37	40	40	33
		20-27	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	57	66*	62*	48	66*	55	41	66*	49	35
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	61*	66*	63*	49	66*	54	40	66*	47	33	66*	41	28	61*	36	25	54	32	33
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	61*	65*	65*	52	65*	61*	45
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	61*	65*	65*	51	65*	59*	43	57	51	36	50	45	31	45	40	27
	C	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	39	50	48	34	50	42	30	50	38	40
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	44	50	50	41	50	48	34	50	42	44	49	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	48	40	54	42	34	54	36	30	49	32	40	43	43	36
			Exposed	54	54	54	54	54	54	54	54	52	54	54	47	54	52	43	54	47	39	54	43	36	54	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	66*	53	66*	58	44	66*	50	36	67*	44	31	66*	39	26	58	34	24
			Exposed	66*	66*	66*	66*	66*	66*	66*	66*	64*	66*	66*	55	66*	63*	48	66*	57	43	66*	52	38	66*	44	31	65*	38	26	56	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	55	65*	65*	55	65*	63*	47	61*	55	40	54	48	34	48	43	30
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	61*	65*	65*	54	65*	65*	49	62*	55	40	53	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	44	55	53	38	55	46	33	55	40	43	49	35	38	43	32	34
			Exposed	55	55	55	55	55	55	55	55	50	55	55	45	55	55	41	55	53	37	55	48	34	55	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	55	60	60	50	60	56	46	60	47	39	60	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	60	60	55	60	59	49	60	53	44	60	48	40	60	44	36	60	40	33	56	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	68*	70*	70*	59	70*	67*	53	70*	57	43	70*	49	35	70*	42	29	63	37	25	55	32	34	49	43	30
			Exposed	70*	70*	68*	70*	70*	57	70*	64	50	70*	58	44	70*	53	39	70*	48	34	70*	44	31	63	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	69*	67*	69*	69*	54	68*	61	45	59	53	38	51	46	32	45	41	28	40	36	37
			Exposed	69*	69*	69*	69*	69*	69*	69*	69*	64*	69*	69*	55	69*	67*	49	68*	60	44	61	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~
80	B	0-7	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	43	44	44	38
			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	42	44	44	36	44	44	32	44	39	42	44	35	37
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	46	38	48	40	33
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	45	37	48	39	32	48	34	42	46	30	37	40	40	33
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	57*	62*	62*	48	62*	55*	41	62*	49	35
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	49	62*	54*	40	62*	47	33	62*	41	28	61*	36	25	54*	32	33
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	60*	62*	62*	52*	62*	61*	45
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	51	62*	59*	43	57*	52*	36	50	45	31	45	40	27
	C	0-7	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	39	44	44	34	44	42	30	44	38	40
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	34	44	42	44	44	36	39	43	31	34	38	42	~~30~~	34	37	~~26~~
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	42	34	48	36	30	48	32	40	43	43	36
			Exposed	48	48	48	48	48	48	48	48	48	48	48	47	48	48	43	48	47	39	48	43	36	48	37	30	48	31	39	42	41	34	36	36	30	32	32	~~26~~	43	~~28~~	~~23~~
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	53	62*	58*	44	62*	50	36	62*	44	31	61*	39	26	58*	34	24
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	62*	48	62*	57*	43	62*	52	38	62*	44	31	62*	38	26	56*	33	34	49	43	30	43	38	26	38	34	23
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	55*	62*	62*	47	61*	55*	40	54*	48	34	48	43	30	43	30	
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	61*	62*	62*	55*	62*	62*	49	62*	56*	40	53*	48	33	46	41	28	40	36	36	36	32	31	32	43	27
	D	0-7	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	38	49	46	33	49	40	43	49	35	38	43	32	34
			Exposed	49	49	49	49	49	49	49	49	49	49	49	45	49	49	41	49	49	37	49	48	34	49	41	44	48	35	37	41	46	32	36	40	~~28~~	32	35	~~25~~	43	31	~~22~~
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	46	53	47	39	53	40	33	53	35	29	47	31	38	41	41	34	36	36	30
			Exposed	53	53	53	53	53	49	53	53	44	53	48	40	53	44	36	53	40	33	53	36	30	47	31	39	40	40	33	35	35	~~29~~	46	30	~~25~~	41	~~27~~	~~22~~	36	~~24~~	~~20~~
		20-27	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	59	65*	65*	53	65*	57	43	65*	49	35	64*	42	29	63*	37	25	55	32	34	49	43	30
			Exposed	65*	65*	65*	65*	65*	57	65*	64*	50	65*	58	44	65*	53	39	65*	48	34	65*	44	31	63*	37	25	54	32	33	47	42	29	41	37	25	36	32	~~22~~	32	~~29~~	~~20~~
		27-45	Interior	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	65*	54	65*	61*	45	59*	53	38	51	46	32	45	41	28	40	36	37
			Exposed	65*	65*	65*	65*	65*	65*	65*	65*	63*	65*	65*	55	65*	65*	49	65*	60*	44	61*	55	40	52	47	33	45	40	27	39	35	35	34	30	30	30	40	26	40	36	~~22~~

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	Flashloc Comp
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	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
90	B	0-7	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	38
			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	36	39	39	32	39	39	42	39	35	37
		7-20	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	38	43	40	33
			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	37	43	39	32	43	34	42	43	30	37	40	40	33
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	70	73*	73*	59
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	69	73*	70	55	73*	62	43	73*	54	37	73*	48	33
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	70*	71*	71*	59	71*	68	49	68	60	41
	C	0-7	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	34	39	39	30	39	38	40
			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	44	39	36	39	39	31	34	38	42	30	34	37	26
		7-20	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	40	43	42	34	43	36	30	43	32	40	43	43	36
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	37	30	43	31	39	42	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	62	73*	67	49	73*	58	40	73*	52	36
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	67	50	73*	57	39	73*	50	34	71	43	30	65	38	26	58	34	23
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	66	71*	71*	55	71*	65	46
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	67	71*	71*	53	70*	62	43	61	54	36	54	48	32	48	43	27
	D	0-7	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	38	44	44	33	44	40	43	44	35	38	43	32	34
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	34	44	41	44	44	35	37	41	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	47	47	39	47	40	33	47	35	29	47	31	38	41	41	34	36	36	30
			Exposed	47	47	47	47	47	47	47	47	44	47	47	40	47	44	36	47	40	33	47	36	30	47	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	59*	62*	62*	53	62*	57*	43	62*	49	35	62*	42	29	61*	37	25	55*	32	34	49	43	30
			Exposed	62*	62*	62*	62*	62*	57*	62*	62*	50	62*	58*	44	62*	53	39	62*	48	34	62*	44	31	62*	37	25	54*	32	33	47	42	29	41	37	25	36	32	22	32	29	20
		27-45	Interior	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	54*	62*	61*	72	59*	53*	62	52*	69	51	69	62	42	61	55	37
			Exposed	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	62*	56*	62*	62*	75	62*	60*	71	61*	55*	67	52*	70	52	68	60	41	58	52	35	51	46	30	45	40	26	40	36	22
100	B	0-7	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
			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	32	36	36	42	36	35	37
		7-20	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	38	39	39	33
			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	37	39	39	32	39	34	42	39	30	37	39	40	33
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	59
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	69*	70*	70*	55	70*	62	43	70*	54	37	70*	48	33
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	59	68*	68*	49	68*	60	41
	C	0-7	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	34	36	36	30	36	36	40
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	44	36	36	39	36	31	34	36	42	30	34	37	26
		7-20	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	34	39	36	30	39	32	40	39	43	36
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	37	30	39	31	39	39	41	34	36	36	30	32	32	26	43	28	23
		20-27	Interior	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	62	70*	67*	49	70*	58	40	70*	52	36
			Exposed	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	70*	67*	70*	67*	50	70*	57	39	70*	50	34	70*	43	30	65	38	26	58	34	23
		27-45	Interior	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	66*	68*	68*	55	68*	65*	46
			Exposed	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	68*	67*	68*	68*	53	68*	63*	43	61	54	36	54	48	32	48	43	27
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	38	39	39	33	39	39	43	39	35	38	39	32	34
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	34	39	39	44	39	35	37	39	46	32	36	40	28	32	35	25	43	31	22
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	40	33	43	35	29	43	31	38	41	41	34	36	36	30
			Exposed	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	40	33	43	36	30	43	31	39	40	40	33	35	35	29	46	30	25	41	27	22	36	24	20
		20-27	Interior	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	72*	73*	72*	59	73*	63	45	73*	56	38	73*	49	34	71	44	30
			Exposed	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	73*	67	73*	72*	57	73*	67	49	73*	56	39	73*	48	33	69	42	29	62	37	25	55	32	22	49	29	20
		27-45	Interior	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	62	71*	69*	51	69*	61	42	61	55	37
			Exposed	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	71*	66	71*	70*	52	68	60	41	58	52	35	51	46	30	45	40	26	40	36	22

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

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

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.