Design Criteria for Span Tables:

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

Building Assumptions

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

Wind Design Assumptions

- Wind loads used are based on ASCE 7-10 Sec 30.4.2
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0

Snow Design Assumptions

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

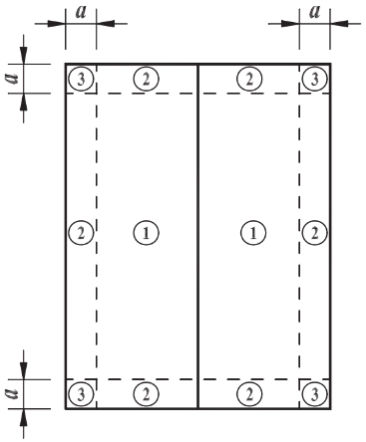
Seismic Design Assumptions

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

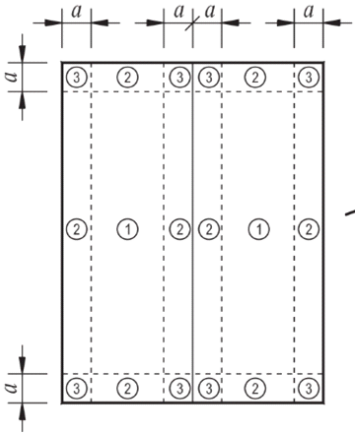
Array Assumptions

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

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



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

Rails can be installed in these possible orientations.

#N/A

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ASCE 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	80	80	60	80	80	50	80	79	43	80	69	39	80	60	35	80	53	32	80	48	29	77	39	24	65	33	21	55	29	18	48	25	16	41	22	21	37	20	19
		7-27	80	80	60	80	80	53	80	80	47	80	71	42	80	63	38	80	56	34	80	50	31	80	41	26	73	35	23	62	31	19	53	27	17	46	23	23	41	21	20
		27-45	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	77	77	77	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	80	66	37	80	57	33	80	49	30	80	43	27	77	39	24	69	36	22	63	32	20	52	27	17	44	23	22	38	20	19	33	18	17	29	15	15	26	21	13
		7-27	80	68	40	80	59	36	80	52	32	80	46	29	80	41	26	77	38	24	70	34	22	58	29	18	49	25	16	42	21	21	37	19	18	32	16	16	28	22	14
		27-45	83	83	83	80	80	80	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	80	52	31	80	45	28	79	40	25	70	36	23	63	33	20	57	30	19	51	27	17	43	23	22	37	20	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	80	55	34	80	48	30	80	42	27	79	38	24	71	34	22	64	31	20	58	29	18	48	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	19	12
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
10	B	0-7	57	57	57	57	57	50	57	57	43	57	57	39	57	57	35	57	53	32	57	48	29	57	39	24	57	33	21	55	29	18	48	25	16	41	22	21	37	20	19
		7-27	57	57	57	57	57	53	57	57	47	57	57	42	57	57	38	57	56	34	57	50	31	57	41	26	57	35	23	57	31	19	53	27	17	46	23	23	41	21	20
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	76	76	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
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		27-45	80	80	80	78	78	78	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
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		7-27	57	55	34	57	48	30	57	42	27	57	38	24	57	34	22	57	31	20	55	29	18	48	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	19	12
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
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		7-27	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	26	40	35	23	39	31	19	37	27	17	36	23	23	34	21	20
		27-45	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	62	62	59	59	59	54	54	54	50	50	50	45	44	44	42	38	38	38	34	34	34	30	30
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		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	21	33	19	18	31	16	16	28	22	14
		27-45	65	65	65	64	64	64	60	60	60	57	57	57	54	54	54	51	51	51	49	49	49	44	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	39	39	31	39	39	28	39	39	25	39	36	23	39	33	20	39	30	19	39	27	17	39	23	22	37	20	19	32	17	16	27	22	14	24	20	12	21	17	11
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	C	0-7	38	38	37	38	38	33	38	38	30	38	38	27	38	38	24	38	36	22	38	32	20	38	27	17	38	23	22	38	20	19	33	18	17	29	15	15	26	21	13
		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	21	33	19	18	31	16	16	28	22	14
		27-45	55	55	55	54	54	54	51	51	51	49	49	49	47	47	47	45	45	45	43	43	43	39	39	39	36	35	35	33	31	31	30	27	27	27	24	24	25	21	21
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		7-27	40	40	34	40	40	30	40	40	27	40	38	24	40	34	22	39	31	20	38	29	18	36	24	15	34	21	20	32	18	17	31	16	15	27	21	13	24	19	12
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		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	26	34	34	23	33	31	19	32	27	17	31	23	23	30	21	20
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		7-27	34	34	34	34	34	34	34	34	32	34	34	29	34	34	26	34	34	24	34	34	22	33	29	18	31	25	16	30	21	21	29	19	18	27	16	16	26	22	14
		27-45	48	48	48	46	46	46	45	45	45	43	43	43	41	41	41	40	40	40	38	38	38	35	35	35	32	32	32	30	30	30	28	27	27	25	24	24	24	21	21
	D	0-7	34	34	31	34	34	28	34	34	25	34	34	23	34	33	20	34	30	19	34	27	17	34	23	22	34	20	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	36	36	34	36	36	30	36	36	27	36	36	24	36	34	22	36	31	20	35	29	18	33	24	15	31	21	20	30	18	17	28	16	15	27	21	13	24	19	12
		27-45	48	48	48	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	36	36	36	33	33	33	30	30	30	28	26	26	25	22	22	23	20	20	21	17	17
50	B	0-7	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	26	21	26	26	18	26	25	16	26	22	21	26	20	19
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	23	28	28	19	28	27	17	27	23	23	26	21	20
		27-45	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	40	40	39	39	39	37	37	37	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27
	C	0-7	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	17	26	23	22	26	20	19	26	18	17	26	15	15	26	21	13
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	22	28	28	18	27	25	16	26	21	21	25	19	18	24	16	16	23	22	14
		27-45	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	34	34	34	32	32	32	30	30	30	27	27	27	25	25	25	24	24	24	22	21	21
	D	0-7	29	29	29	29	29	28	29	29	25	29	29	23	29	29	20	29	29	19	29	27	17	29	23	22	29	20	19	29	17	16	27	22	14	24	20	12	21	17	11
		7-27	31	31	31	31	31	30	31	31	27	31	31	24	31	31	22	31	31	20	30	29	18	29	24	15	28	21	20	26	18	17	25	16	15	24	21	13	23	19	12
		27-45	43	43	43	41	41	41	39	39	39	38	38	38	36	36	36	35	35	35	33	33	33	31	31	31	28	28	28	26	26	26	24	22	22	22	20	20	20	17	17

* 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 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	22	22	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	16	22	22	21	22	20	19
		7-27	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	19	24	24	17	24	23	23	23	21	20
		27-45	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	54	54	53	53	53	50	50	50	47	47	47	45	45	45	42	42	42	40	40	40	38	38	38
	C	0-7	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	22	22	22	20	19	22	18	17	22	15	15	22	21	13
		7-27	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	18	24	24	16	23	21	21	22	19	18	21	16	16	21	22	14
		27-45	56	56	56	55	55	55	53	53	53	52	52	52	50	50	50	49	49	49	47	47	47	44	44	44	41	41	41	38	38	38	36	36	36	33	33	33	31	31	31
	D	0-7	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	23	22	24	20	19	24	17	16	24	22	14	24	20	12	21	17	11
		7-27	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	18	25	24	15	24	21	20	24	18	17	23	16	15	22	21	13	21	19	12
		27-45	38	38	38	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	31	31	31	28	28	28	26	26	26	24	24	24	22	22	22	21	20	20	19	17	17
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		7-27	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	34	42	42	30	41	40	26	40	35	23	38	31	20
		27-45	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	49	49	48	48	48	46	46	46	44	44	44	41	41	41	39	39	39	37	37	37	35	35	35
	C	0-7	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	22	19	19	19	19	18	17	19	15	15	19	21	13
		7-27	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	36	42	42	33	42	42	28	40	37	24	39	32	21	37	28	18	36	25	16	34	22	14
		27-45	51	51	51	50	50	50	49	49	49	47	47	47	46	46	46	44	44	44	43	43	43	41	41	41	38	38	38	36	36	36	34	34	34	31	31	31	30	30	30
	D	0-7	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	19	21	21	17	21	21	22	21	20	19	21	17	16	21	22	14	21	20	12	21	17	11
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		27-45	53	53	53	51	51	51	49	49	49	47	47	47	46	46	46	44	44	44	43	43	43	40	40	40	37	37	37	34	34	34	32	32	32	30	30	30	28	27	27
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		7-27	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	33	24	33	32	21	32	28	18	31	25	16	30	22	14
		27-45	46	46	46	46	46	46	44	44	44	43	43	43	42	42	42	41	41	41	40	40	40	38	38	38	35	35	35	33	33	33	31	31	31	30	30	30	28	28	28
	D	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	22	18	18	19	18	17	16	18	22	14	18	20	12	18	17	11
		7-27	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	40	30	40	40	28	39	37	23	38	31	20	36	27	17	35	24	15	33	21	13	32	19	12
		27-45	48	48	48	47	47	47	45	45	45	44	44	44	42	42	42	41	41	41	40	40	40	37	37	37	35	35	35	32	32	32	30	30	30	28	28	28	26	26	26
90	B	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	21	15	15	19
		7-27	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	29	23	29	29	20
		27-45	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	31	31	31
	C	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	22	15	15	19	15	15	17	15	15	15	15	21	13
		7-27	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	29	21	29	28	18	28	25	16	27	22	14
		27-45	41	41	41	41	41	41	41	41	41	40	40	40	39	39	39	38	38	38	37	37	37	35	35	35	33	33	33	31	31	31	30	30	30	28	28	28	26	26	26
	D	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	22	16	16	19	16	16	16	16	22	14	16	20	12	16	17	11
		7-27	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	32	23	32	31	20	31	27	17	30	24	15	29	21	13	28	19	12
		27-45	45	45	45	43	43	43	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27	25	25	25
100	B	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	20	13	13	19
		7-27	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	33	30	33	33	26	33	33	23	33	31	20
		27-45	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	52*	52*	52*	55*	55*	55*	54*	54*	54*	56*	56*	56*	35	35	35	33	33	33	32	32	32	31	31	31	29	29	29
	C	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	19	13	13	20	13	13	19	13	13	17	13	13	15	13	20	13
		7-27	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	33	24	33	32	21	32	28	18	31	25	16	30	22	14
		27-45	53*	53*	53*	52*	52*	52*	55*	55*	55*	56*	56*	56*	36	36	36	35	35	35	35	35	35	33	33	33	31	31	31	30	30	30	28	28	28	27	27	27	25	25	25
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	22	15	15	19	15	15	16	15	22	14	15	20	12	15	17	11
		7-27	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	23	29	29	20	29	27	17	28	24	15	27	21	13	26	19	12
		27-45	41	41	41	40	40	40	39	39	39	38	38	38	37	37	37	36	36	36	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27	26	26	26	24	24	24

* 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 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	98	98	92	98	98	87	98	98	83	98	94	65	98	91	59	98	87	54	98	84	49	97	67	41	91	56	35	87	49	31	81	42	27	70	37	36	62	33	32
		7-27	99	99	90	99	99	86	99	99	82	99	95	71	99	91	63	99	88	58	99	85	53	99	72	44	95	60	38	90	51	33	86	45	29	79	40	38	69	35	34
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	98	93	63	98	89	56	98	85	50	98	78	45	96	66	41	93	60	37	90	55	34	85	46	29	75	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	99	94	68	99	90	60	99	86	54	99	82	49	99	71	44	97	63	40	94	58	37	88	49	31	83	42	27	71	36	35	62	32	31	54	28	27	48	37	24
		27-45	99	99	99	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	98	87	53	98	82	47	97	69	42	94	61	38	90	55	34	87	50	31	85	46	29	73	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	99	87	57	99	84	51	99	74	45	97	64	41	94	58	37	91	53	34	88	48	31	82	41	26	69	35	34	59	30	29	52	26	26	45	35	23	40	31	20
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
10	B	0-7	88	88	88	88	88	87	88	88	83	88	88	65	88	88	59	88	87	54	88	84	49	88	67	41	88	56	35	87	49	31	81	42	27	70	37	36	62	33	32
		7-27	88	88	88	88	88	86	88	88	82	88	88	71	88	88	63	88	88	58	88	85	53	88	72	44	88	60	38	88	51	33	86	45	29	79	40	38	69	35	34
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	88	88	63	88	88	56	88	85	50	88	78	45	88	66	41	88	60	37	88	55	34	85	46	29	75	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	88	88	68	88	88	60	88	86	54	88	82	49	88	71	44	88	63	40	88	58	37	88	49	31	83	42	27	71	36	35	62	32	31	54	28	27	48	37	24
		27-45	98	98	98	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	88	87	53	88	82	47	88	69	42	88	61	38	88	55	34	87	50	31	85	46	29	73	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	88	87	57	88	84	51	88	74	45	88	64	41	88	58	37	88	53	34	88	48	31	82	41	26	69	35	34	59	30	29	52	26	26	45	35	23	40	31	20
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
20	B	0-7	66	66	66	66	66	66	66	66	66	66	66	65	66	66	59	66	66	54	66	66	49	66	66	41	66	56	35	66	49	31	66	42	27	66	37	36	62	33	32
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	38	58	35	34
		27-45	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	91	91	89	89	89	87	87	87	84	84	84	76	75	75	70	64	64	63	56	56	57	50	50
	C	0-7	66	66	63	66	66	56	66	66	50	66	66	45	66	66	41	66	60	37	66	55	34	66	46	29	66	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	35	55	32	31	52	28	27	48	37	24
		27-45	92	92	92	91	91	91	90	90	90	88	88	88	87	87	87	85	85	85	82	82	82	74	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	34	54	30	29	51	26	26	45	35	23	40	31	20
		27-45	92	92	92	90	90	90	88	88	88	86	86	86	85	84	84	80	78	78	75	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
30	B	0-7	64	64	64	64	64	64	64	64	64	64	64	64	64	64	59	64	64	54	64	64	49	64	64	41	64	56	35	64	49	31	64	42	27	64	37	36	62	33	32
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	38	58	35	34
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	86	86	85	85	85	79	79	79	73	73	73	67	67	67	62	62	62	58	56	56	54	50	50
	C	0-7	64	64	63	64	64	56	64	64	50	64	64	45	64	64	41	64	60	37	64	55	34	64	46	29	64	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	35	55	32	31	52	28	27	48	37	24
		27-45	87	87	87	86	86	86	85	85	85	82	82	82	79	79	79	75	75	75	72	72	72	65	65	65	60	60	60	55	52	52	50	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	34	54	30	29	51	26	26	45	35	23	40	31	20
		27-45	87	87	87	86	86	86	83	83	83	79	79	79	75	75	75	71	71	71	67	67	67	61	58	58	55	50	50	50	43	43	44	38	38	39	33	33	35	30	30
40	B	0-7	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	53	35	53	49	31	53	42	27	53	37	36	53	33	32
		7-27	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	53	56	56	44	56	56	38	55	51	33	53	45	29	52	40	38	50	35	34
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	77	77	77	74	74	74	69	69	69	64	64	64	60	60	60	56	56	56	53	53	53	49	49	49
	C	0-7	53	53	53	53	53	53	53	53	50	53	53	45	53	53	41	53	53	37	53	53	34	53	46	29	53	39	37	53	34	32	53	30	28	49	26	25	43	35	22
		7-27	56	56	56	56	56	56	56	56	54	56	56	49	56	56	44	56	56	40	56	56	37	55	49	31	52	42	27	50	36	35	48	32	31	46	28	27	44	37	24
		27-45	80	80	80	78	78	78	75	75	75	72	72	72	69	69	69	66	66	66	64	64	64	59	59	59	54	54	54	50	50	50	46	45	45	43	40	40	40	35	35
	D	0-7	57	57	53	57	57	47	57	57	42	57	57	38	57	55	34	57	50	31	57	46	29	57	39	37	57	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	60	60	57	60	60	51	60	60	45	60	60	41	60	58	37	60	53	34	58	48	31	55	41	26	53	35	34	50	30	29	47	26	26	45	35	23	40	31	20
		27-45	80	80	80	77	77	77	73	73	73	70	70	70	67	67	67	64	64	64	61	61	61	56	56	56	51	50	50	46	43	43	43	38	38	39	33	33	35	30	30
50	B	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	35	43	43	31	43	42	27	43	37	36	43	33	32
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	38	47	47	33	46	45	29	45	40	38	43	35	34
		27-45	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	68	68	66	66	66	62	62	62	58	58	58	55	55	55	51	51	51	48	48	48	45	45	45
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	37	43	43	34	43	43	29	43	39	37	43	34	32	43	30	28	43	26	25	43	35	22
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	40	47	47	37	47	47	31	45	42	27	44	36	35	42	32	31	40	28	27	39	37	24
		27-45	70	70	70	69	69	69	66	66	66	64	64	64	62	62	62	59	59	59	57	57	57	53	53	53	50	50	50	46	46	46	43	43	43	40	40	40	37	35	35
	D	0-7	48	48	48	48	48	47	48	48	42	48	48	38	48	48	34	48	48	31	48	46	29	48	39	37	48	33	31	48	29	27	46	38	24	41	33	21	36	30	19
		7-27	52	52	52	52	52	51	52	52	45	52	52	41	52	52	37	51	51	34	50	48	31	48	41	26	46	35	34	44	30	29	42	26	26	40	35	23	38	31	20
		27-45	71	71	71	69	69	69	66	66	66	63	63	63	60	60	60	58	58	58	56	56	56	51	51	51	47	47	47	43	43	43	40	38	38	37	33	33	34	30	30

* 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 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	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	31	37	37	27	37	37	36	37	33	32
		7-27	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	68	85	85	57	85	83	50	84	69	44	81	60	38	78	53	34
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	86	86	85	85	85	80	80	80	75	75	75	71	71	71	67	67	67	63	63	63
	C	0-7	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	29	37	37	37	37	34	32	37	30	28	37	26	25	37	35	22
		7-27	85	85	85	85	85	85	85	85	84	85	85	76	85	85	67	85	85	61	85	85	56	85	77	47	82	63	40	78	54	35	75	48	31	71	42	27	67	37	24
		27-45	87	87	87	87	87	87	86	86	86	85	85	85	84	84	84	82	82	82	79	79	79	74	74	74	69	69	69	64	64	64	60	60	60	56	56	56	52	52	52
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	29	40	39	37	40	33	31	40	29	27	40	38	24	40	33	21	36	30	19
		7-27	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	34	44	44	31	43	41	26	41	35	34	39	30	29	38	26	26	36	35	23	35	31	20
		27-45	64	64	64	62	62	62	60	60	60	58	58	58	55	55	55	53	53	53	51	51	51	47	47	47	44	44	44	41	41	41	38	38	38	35	33	33	32	30	30
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		7-27	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	69	50	69	69	44	66	60	38	64	53	34
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		27-45	81	81	81	81	81	81	81	81	81	79	79	79	77	77	77	75	75	75	72	72	72	68	68	68	64	64	64	60	60	60	56	56	56	53	53	53	49	49	49
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		7-27	84	84	84	84	84	80	84	84	69	84	84	62	84	84	56	84	84	51	83	76	47	79	62	40	75	53	34	71	46	29	67	40	26	64	35	23	61	31	20
		27-45	85	85	85	85	85	85	83	83	83	80	80	80	77	77	77	74	74	74	72	72	72	66	66	66	62	62	62	58	58	58	54	54	54	50	50	50	46	45	45
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		27-45	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	74	74	71	71	71	67	67	67	64	64	64	61	61	61	58	58	58	55	55	55
	C	0-7	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	37	28	28	32	28	28	28	28	26	25	28	35	22
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	40	55	54	35	53	48	31	51	42	27	49	37	24
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		27-45	80	80	80	79	79	79	76	76	76	74	74	74	71	71	71	69	69	69	67	67	67	62	62	62	58	58	58	54	54	54	51	51	51	47	47	47	44	44	44
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		27-45	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	68	68	65	65	65	63	63	63	60	60	60	57	57	57	55	55	55	52	52	52
	C	0-7	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	37	25	25	32	25	25	28	25	25	25	25	35	22
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		27-45	69	69	69	69	69	69	69	69	69	67	67	67	65	65	65	64	64	64	62	62	62	59	59	59	56	56	56	53	53	53	50	50	50	47	47	47	44	44	44
	D	0-7	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	37	27	27	31	27	27	27	27	38	24	27	33	21	27	30	19
		7-27	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	47	54	54	40	54	53	34	52	46	29	50	40	26	48	35	23	46	31	20
		27-45	75	75	75	73	73	73	70	70	70	68	68	68	66	66	66	64	64	64	62	62	62	59	59	59	55	55	55	51	51	51	48	48	48	45	45	45	42	42	42
100	B	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	34	22	22	32
		7-27	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	44	50	50	38	50	50	34
		27-45	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	61	61	61	58	58	58	56	56	56	54	54	54	51	51	51	49	49	49
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	34	22	22	32	22	22	28	22	22	25	22	34	22
		7-27	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	40	50	50	35	49	48	31	48	42	27	46	37	24
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	D	0-7	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	37	25	25	31	25	25	27	25	37	24	25	33	21	25	30	19
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		27-45	69	69	69	67	67	67	66	66	66	64	64	64	62	62	62	60	60	60	59	59	59	55	55	55	52	52	52	49	49	49	46	46	46	43	43	43	41	41	41

* 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 7-10	II	30 ft	Ss = 1.25	22.78 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	67	67	50	67	67	42	67	66	36	67	57	32	67	50	29	67	45	27	67	40	24	64	33	20	54	28	17	46	24	15	40	21	20	35	18	18	31	16	16
		7-27	67	67	50	67	67	44	67	67	39	67	59	35	67	53	31	67	47	29	67	42	26	67	35	22	61	30	19	52	26	16	44	22	22	39	20	19	34	17	17
		27-45	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	64	64	60	60	60	52	51	51	45	43	43	40	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	67	55	31	67	47	28	67	41	25	67	36	22	64	33	20	58	30	19	52	27	17	43	23	22	37	19	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	67	57	34	67	50	30	67	44	27	67	39	24	67	34	22	65	31	20	59	29	18	49	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	18	12
		27-45	69	69	69	67	67	67	61	61	61	56	56	56	52	51	51	48	46	46	44	41	41	38	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
	D	0-7	67	44	26	67	38	23	66	33	21	59	30	19	53	27	17	47	25	15	43	23	21	36	19	18	31	16	16	26	21	13	23	19	12	20	16	10	18	15	9
		7-27	67	46	28	67	40	25	67	35	22	66	32	20	59	29	18	53	26	17	48	24	23	40	20	20	34	17	17	29	23	14	26	20	13	22	17	11	20	15	10
		27-45	63	63	63	58	58	58	53	52	52	48	47	47	44	42	42	41	38	38	38	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	22	22
10	B	0-7	47	47	47	47	47	42	47	47	36	47	47	32	47	47	29	47	45	27	47	40	24	47	33	20	47	28	17	46	24	15	40	21	20	35	18	18	31	16	16
		7-27	48	48	48	48	48	44	48	48	39	48	48	35	48	48	31	48	47	29	48	42	26	48	35	22	48	30	19	47	26	16	44	22	22	39	20	19	34	17	17
		27-45	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	63	63	60	60	60	52	51	51	45	43	43	40	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	47	47	31	47	47	28	47	41	25	47	36	22	47	33	20	47	30	19	47	27	17	43	23	22	37	19	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	48	48	34	48	48	30	48	44	27	48	39	24	48	34	22	48	31	20	48	29	18	46	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	18	12
		27-45	67	67	67	65	65	65	61	61	61	56	56	56	52	51	51	48	46	46	44	41	41	38	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
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		27-45	55	55	55	55	55	55	55	55	55	55	55	55	54	54	54	52	52	52	50	50	50	45	45	45	41	41	41	38	37	37	35	32	32	31	28	28	28	25	25
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		27-45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	44	44	42	42	42	39	39	39	36	36	36	34	34	34	31	31	31	29	28	28	27	25	25
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	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	19	22	22	17	22	22	22	22	19	19	22	17	16	22	22	14	22	20	12	21	17	11
		7-27	49	49	49	49	49	45	49	49	41	49	49	37	49	49	33	49	47	30	49	43	28	47	36	23	45	31	20	43	27	17	41	24	15	39	21	13	36	18	12
		27-45	53	53	53	51	51	51	50	50	50	48	48	48	46	46	46	45	45	45	43	43	43	40	40	40	37	37	37	35	35	35	32	32	32	30	30	30	28	26	26
	D	0-7	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	24	15	24	23	21	24	19	18	24	16	16	24	21	13	23	19	12	20	16	10	18	15	9
		7-27	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	26	17	25	24	23	24	20	20	23	17	17	22	23	14	21	20	13	20	17	11	19	15	10
		27-45	36	36	36	34	34	34	33	33	33	31	31	31	30	30	30	29	29	29	28	28	28	25	25	25	23	23	23	22	21	21	20	19	19	18	16	16	17	22	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 7-10	II	30 ft	Ss = 1.25	22.78 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	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	15	18	18	20	18	18	18	18	16	16
		7-27	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	36	28	36	36	25	35	34	22	34	30	19	33	26	17
		27-45	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	35	35	35	33	33	33	32	32	32
	C	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	22	18	18	19	18	17	16	18	22	14	18	20	12	18	17	11
		7-27	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	36	28	36	36	23	35	31	20	33	27	17	32	24	15	31	21	13	29	18	12
		27-45	47	47	47	46	46	46	45	45	45	43	43	43	42	42	42	41	41	41	39	39	39	37	37	37	34	34	34	32	32	32	30	30	30	28	28	28	26	26	26
	D	0-7	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	15	20	20	21	20	19	18	20	16	16	20	21	13	20	19	12	20	16	10	18	15	9
		7-27	43	43	42	43	43	38	43	43	34	43	43	31	43	43	28	42	40	25	41	36	23	40	31	20	38	26	17	36	23	14	34	20	13	32	17	11	30	15	10
		27-45	48	48	48	47	47	47	45	45	45	43	43	43	42	42	42	40	40	40	38	38	38	36	36	36	33	33	33	31	31	31	28	28	28	26	25	25	24	22	22
70	B	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	20	16	16	18	16	16	16
		7-27	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	31	31	22	31	30	19	30	26	17
		27-45	43	43	43	43	43	43	43	43	43	43	43	43	42	42	42	41	41	41	40	40	40	38	38	38	36	36	36	35	35	35	33	33	33	31	31	31	29	29	29
	C	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	22	16	16	19	16	16	16	16	22	14	16	20	12	16	17	11
		7-27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	28	31	31	23	31	31	20	30	27	17	29	24	15	28	21	13	27	18	12
		27-45	43	43	43	42	42	42	41	41	41	39	39	39	38	38	38	37	37	37	36	36	36	34	34	34	32	32	32	30	30	30	28	28	28	26	26	26	25	25	25
	D	0-7	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	21	17	17	18	17	16	16	17	21	13	17	19	12	17	16	10	17	15	9
		7-27	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	25	34	34	23	33	31	20	32	26	17	31	23	14	29	20	13	28	17	11	27	15	10
		27-45	44	44	44	43	43	43	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	33	33	33	31	31	31	29	29	29	27	27	27	25	25	25	23	22	22
80	B	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	20	14	14	18	14	14	16
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	28	34	34	25	34	34	22	33	30	19	32	26	17
		27-45	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	38	38	37	37	37	35	35	35	34	34	34	32	32	32	31	31	31	29	29	29	28	28	28
	C	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	21	14	14	19	14	14	16	14	21	14	14	20	12	14	17	11
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	30	34	34	28	34	34	23	33	31	20	32	27	17	31	24	15	30	21	13	29	18	12
		27-45	39	39	39	38	38	38	37	37	37	36	36	36	35	35	35	34	34	34	33	33	33	31	31	31	30	30	30	28	28	28	26	26	26	25	25	25	23	23	23
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	21	15	15	18	15	15	16	15	21	13	15	19	12	15	16	10	15	15	9
		7-27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	30	23	30	30	20	29	26	17	28	23	14	27	20	13	26	17	11	25	15	10
		27-45	44	44	44	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	33	33	33	31	31	31	29	29	29	27	27	27	25	25	25	23	22	22
90	B	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	19	12	12	18	12	12	16
		7-27	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	27	27	22	27	27	19	27	26	17
		27-45	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	51*	51*	51*	50*	50*	50*	52*	52*	52*	33	33	33	31	31	31	30	30	30	29	29	29	27	27	27	26	26	26
	C	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	19	12	12	19	12	12	16	12	19	14	12	19	12	12	17	11
		7-27	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	27	17	26	24	15	25	21	13	25	18	12
		27-45	52*	52*	52*	50*	50*	50*	53*	53*	53*	33	33	33	33	33	33	32	32	32	31	31	31	29	29	29	28	28	28	26	26	26	25	25	25	23	23	23	22	22	22
	D	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	21	14	14	18	14	14	16	14	21	13	14	19	12	14	16	10	14	15	9
		7-27	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	25	34	34	23	33	31	20	32	26	17	30	23	14	29	20	13	28	17	11	27	15	10
		27-45	37	37	37	36	36	36	35	35	35	34	34	34	33	33	33	32	32	32	31	31	31	29	29	29	27	27	27	26	26	26	24	24	24	23	23	23	21	21	21
100	B	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	17	11	11	17	11	11	16
		7-27	22	22	22	22	22	22	22	22	22	22	22	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
		27-45	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	47*	47*	47*	45*	45*	45*	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24
	C	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	17	11	11	17	11	11	16	11	17	14	11	17	12	11	17	11
		7-27	22	22	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	22	15	22	21	13	21	18	12
		27-45	44*	44*	44*	47*	47*	47*	46*	46*	46*	48*	48*	48*	30	30	30	30	30	30	29	29	29	27	27	27	26	26	26	25	25	25	23	23	23	22	22	22	21	21	21
	D	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	19	12	12	18	12	12	16	12	19	13	12	19	12	12	16	10	12	15	9
		7-27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	20	27	26	17	26	23	14	25	20	13	24	17	11	23	15	10
		27-45	54*	54*	54*	52*	52*	52*	33	33	33	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	26	26	26	24	24	24	23	23	23	22	22	22	20	20	20

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UNIRAC

ASCE 7-10	II	30 ft	Ss = 1.25	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	98	98	91	98	98	86	98	98	80	98	94	64	98	90	58	98	86	52	98	83	48	96	65	40	91	55	35	86	48	30	79	42	39	69	37	35	60	32	31
		7-27	98	98	89	98	98	85	98	98	79	98	94	69	98	90	62	98	87	56	98	84	52	98	69	43	94	58	37	89	50	32	85	44	42	77	39	37	67	34	33
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	98	92	62	98	88	55	98	84	49	98	75	44	96	64	40	92	59	37	89	53	34	84	45	28	73	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	98	93	67	98	89	59	98	85	53	98	79	48	98	69	43	96	62	39	93	56	36	87	48	31	82	41	39	70	35	34	60	31	30	53	41	26	47	36	23
		27-45	99	99	99	98	98	98	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	98	86	52	98	79	46	97	66	41	93	59	37	90	54	34	87	49	31	84	45	28	71	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	98	87	55	98	83	49	98	71	44	97	63	40	93	57	36	90	52	33	87	47	30	80	40	39	67	34	33	58	30	29	50	39	25	44	34	22	39	31	20
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	44	44
10	B	0-7	87	87	87	87	87	86	87	87	80	87	87	64	87	87	58	87	86	52	87	83	48	87	65	40	87	55	35	86	48	30	79	42	39	69	37	35	60	32	31
		7-27	87	87	87	87	87	85	87	87	79	87	87	69	87	87	62	87	87	56	87	84	52	87	69	43	87	58	37	87	50	32	85	44	42	77	39	37	67	34	33
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	87	87	62	87	87	55	87	84	49	87	75	44	87	64	40	87	59	37	87	53	34	84	45	28	73	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	87	87	67	87	87	59	87	85	53	87	79	48	87	69	43	87	62	39	87	56	36	87	48	31	82	41	39	70	35	34	60	31	30	53	41	26	47	36	23
		27-45	98	98	98	97	97	97	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	87	86	52	87	79	46	87	66	41	87	59	37	87	54	34	87	49	31	84	45	28	71	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	87	87	55	87	83	49	87	71	44	87	63	40	87	57	36	87	52	33	87	47	30	80	40	39	67	34	33	58	30	29	50	39	25	44	34	22	39	31	20
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	44	44
20	B	0-7	64	64	64	64	64	64	64	64	64	64	64	64	64	64	58	64	64	52	64	64	48	64	64	40	64	55	35	64	48	30	64	42	39	64	37	35	60	32	31
		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	42	59	39	37	56	34	33
		27-45	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	90	90	89	89	89	86	86	86	82	82	82	75	73	73	68	63	63	62	55	55	55	49	49
	C	0-7	64	64	62	64	64	55	64	64	49	64	64	44	64	64	40	64	59	37	64	53	34	64	45	28	64	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	39	57	35	34	54	31	30	51	41	26	47	36	23
		27-45	91	91	91	91	91	91	89	89	89	88	88	88	86	86	86	84	84	84	80	80	80	72	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	39	56	34	33	53	30	29	50	39	25	44	34	22	39	31	20
		27-45	91	91	91	89	89	89	87	87	87	86	86	86	83	83	83	78	76	76	73	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	44	44
30	B	0-7	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	52	63	63	48	63	63	40	63	55	35	63	48	30	63	42	39	63	37	35	60	32	31
		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	42	59	39	37	56	34	33
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	83	83	83	77	77	77	71	71	71	66	66	66	61	61	61	56	55	55	52	49	49
	C	0-7	63	63	62	63	63	55	63	63	49	63	63	44	63	63	40	63	59	37	63	53	34	63	45	28	63	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	39	57	35	34	54	31	30	51	41	26	47	36	23
		27-45	86	86	86	86	86	86	84	84	84	80	80	80	77	77	77	73	73	73	70	70	70	64	64	64	58	58	58	53	50	50	49	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	39	56	34	33	53	30	29	50	39	25	44	34	22	39	31	20
		27-45	86	86	86	85	85	85	81	81	81	77	77	77	73	73	73	69	69	69	65	65	65	59	57	57	54	49	49	49	42	42	43	37	37	38	33	33	34	44	44
40	B	0-7	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	40	52	52	35	52	48	30	52	42	39	52	37	35	52	32	31
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	43	55	55	37	54	50	32	52	44	42	50	39	37	49	34	33
		27-45	78	78	78	78	78	78	78	78	78	78	78	78	77	77	77	75	75	75	72	72	72	68	68	68	63	63	63	59	59	59	55	55	55	51	51	51	48	48	48
	C	0-7	52	52	52	52	52	52	52	52	49	52	52	44	52	52	40	52	52	37	52	52	34	52	45	28	52	39	37	52	33	32	52	29	28	48	39	24	42	34	22
		7-27	55	55	55	55	55	55	55	55	53	55	55	48	55	55	43	55	55	39	55	55	36	53	48	31	51	41	39	49	35	34	47	31	30	45	41	26	43	36	23
		27-45	78	78	78	76	76	76	73	73	73	70	70	70	67	67	67	65	65	65	62	62	62	57	57	57	53	53	53	49	49	49	45	44	44	42	39	39	39	34	34
	D	0-7	56	56	52	56	56	46	56	56	41	56	56	37	56	54	34	56	49	31	56	45	28	56	38	36	56	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	59	59	55	59	59	49	59	59	44	59	59	40	59	57	36	58	52	33	57	47	30	54	40	39	52	34	33	49	30	29	46	39	25	44	34	22	39	31	20
		27-45	79	79	79	75	75	75	72	72	72	68	68	68	65	65	65	62	62	62	59	59	59	54	54	54	50	49	49	45	42	42	42	37	37	38	33	33	34	44	44
50	B	0-7	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	43	35	43	43	30	43	42	39	43	37	35	43	32	31
		7-27	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	88	82	88	88	66	88	87	56	88	80	49	87	67	43	86	58	37	85	52	33
		27-45	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	89	89	89	89	89	89	87	87	87	85	85	85	81	81	81	76	76	76	71	71	71	67	67	67
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	43	34	43	43	28	43	39	37	43	33	32	43	29	28	43	39	24	42	34	22
		7-27	88	88	88	88	88	87	88	88	83	88	88	74	88	88	65	88	88	60	88	86	54	88	75	46	87	62	40	85	53	34	82	47	30	77	41	26	71	36	23
		27-45	90	90	90	90	90	90	89	89	89	88	88	88	87	87	87	86	86	86	85	85	85	79	79	79	73	73	73	68	68	68	63	63	63	58	58	58	54	52	52
	D	0-7	47	47	47	47	47	46	47	47	41	47	47	37	47	47	34	47	47	31	47	45	28	47	38	36	47	32	31	47	42	27	45	37	23	40	33	21	35	29	18
		7-27	51	51	51	51	51	49	51	51	44	51	51	40	51	51	36	50	50	33	49	47	30	47	40	39	45	34	33	43	30	29	41	39	25	39	34	22	37	31	20
		27-45	93	93	93	92	92	92	91	91	91	89	89	89	88	88	88	87	87	87	86	86	86	80	80	80	73	73	73	67	64	64	61	56	56	56	49	49	52	44	44

* 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 7-10	II	30 ft	Ss = 1.25	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	36	36	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	30	36	36	39	36	36	35	36	32	31
		7-27	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	70	56	70	70	49	69	67	43	67	58	38	64	52	33
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	83	83	83	78	78	78	74	74	74	69	69	69	65	65	65	62	62	62
	C	0-7	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	28	36	36	37	36	33	32	36	29	28	36	39	24	36	34	22
		7-27	70	70	70	70	70	70	70	70	70	70	70	70	70	70	65	70	70	60	70	70	54	70	70	46	68	62	40	65	53	34	62	47	30	60	41	26	58	36	23
		27-45	86	86	86	86	86	86	86	86	86	85	85	85	82	82	82	80	80	80	77	77	77	72	72	72	67	67	67	63	63	63	59	59	59	55	55	55	51	51	51
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	40	28	40	38	36	40	32	31	40	42	27	40	37	23	39	33	21	35	29	18
		7-27	84	84	84	84	84	77	84	84	67	84	84	60	84	84	55	84	83	50	83	74	46	79	60	39	75	52	33	71	45	29	67	39	25	63	34	22	59	31	20
		27-45	88	88	88	87	87	87	86	86	86	85	85	85	82	82	82	79	79	79	76	76	76	70	70	70	64	64	64	60	60	60	55	55	55	51	49	49	48	44	44
70	B	0-7	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	30	31	31	39	31	31	35	31	31	31
		7-27	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	56	61	61	49	61	61	43	60	58	38	58	52	33
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	75	75	75	71	71	71	68	68	68	64	64	64	61	61	61	58	58	58
	C	0-7	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	37	31	31	32	31	29	28	31	39	24	31	34	22
		7-27	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	54	61	61	46	61	61	40	59	53	34	57	47	30	55	41	26	53	36	23
		27-45	80	80	80	80	80	80	80	80	80	77	77	77	75	75	75	73	73	73	71	71	71	66	66	66	62	62	62	58	58	58	55	55	55	52	52	52	48	48	48
	D	0-7	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	36	34	32	31	34	42	27	34	37	23	34	33	21	34	29	18
		7-27	67	67	67	67	67	67	67	67	67	67	67	60	67	67	55	67	67	50	67	67	46	65	60	39	62	52	33	60	45	29	57	39	25	55	34	22	52	31	20
		27-45	84	84	84	84	84	84	81	81	81	78	78	78	75	75	75	73	73	73	70	70	70	65	65	65	60	60	60	56	56	56	52	52	52	49	49	49	45	44	44
80	B	0-7	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	39	27	27	35	27	27	31
		7-27	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	56	67	67	49	66	66	43	64	58	38	62	52	33
		27-45	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	74	74	72	72	72	69	69	69	66	66	66	63	63	63	60	60	60	57	57	57	54	54	54
	C	0-7	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	37	27	27	32	27	27	28	27	39	24	27	34	22
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	60	67	67	54	67	67	46	65	62	40	63	53	34	60	47	30	58	41	26	56	36	23
		27-45	75	75	75	75	75	75	73	73	73	71	71	71	69	69	69	67	67	67	65	65	65	62	62	62	58	58	58	55	55	55	52	52	52	49	49	49	46	46	46
	D	0-7	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	36	30	30	31	30	42	27	30	37	23	30	33	21	30	29	18
		7-27	59	59	59	59	59	59	59	59	59	59	59	59	59	59	55	59	59	50	59	59	46	59	59	39	57	52	33	55	45	29	53	39	25	51	34	22	49	31	20
		27-45	79	79	79	77	77	77	74	74	74	72	72	72	70	70	70	67	67	67	65	65	65	61	61	61	57	57	57	53	53	53	50	50	50	46	46	46	43	43	43
90	B	0-7	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	37	24	24	35	24	24	31
		7-27	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	43	54	54	38	53	52	33
		27-45	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	67	67	64	64	64	61	61	61	58	58	58	56	56	56	53	53	53	51	51	51
	C	0-7	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	37	24	24	32	24	24	28	24	37	24	24	34	22
		7-27	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	54	40	53	53	34	52	47	30	50	41	26	48	36	23
		27-45	68	68	68	68	68	68	67	67	67	65	65	65	64	64	64	62	62	62	61	61	61	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	43	43	43
	D	0-7	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	36	27	27	31	27	41	27	27	37	23	27	33	21	27	29	18
		7-27	59	59	59	59	59	59	59	59	59	59	59	59	59	59	55	59	59	50	59	59	46	59	59	39	57	52	33	55	45	29	53	39	25	51	34	22	49	31	20
		27-45	73	73	73	71	71	71	69	69	69	67	67	67	65	65	65	63	63	63	61	61	61	57	57	57	54	54	54	50	50	50	47	47	47	44	44	44	42	42	42
100	B	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	33	22	22	33	22	22	31
		7-27	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	44	44	33
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	57	57	57	55	55	55	53	53	53	50	50	50	48	48	48
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	33	22	22	32	22	22	28	22	33	24	22	33	22
		7-27	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	40	44	44	34	44	44	30	43	41	26	42	36	23
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	58	58	58	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	44	44	44	41	41	41
	D	0-7	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	36	24	24	31	24	37	27	24	37	23	24	33	21	24	29	18
		7-27	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	50	54	54	46	54	54	39	53	52	33	51	45	29	49	39	25	47	34	22	46	31	20
		27-45	68	68	68	66	66	66	64	64	64	62	62	62	61	61	61	59	59	59	57	57	57	54	54	54	51	51	51	48	48	48	45	45	45	42	42	42	40	40	40

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UNIRAC

ASCE 7-10	II	30 ft	Ss = 3.00	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	80	80	60	80	80	50	80	79	43	80	69	39	80	60	35	80	53	32	80	48	29	77	39	24	65	33	21	55	29	18	48	25	16	41	22	21	37	20	19
		7-27	80	80	60	80	80	53	80	80	47	80	71	42	80	63	38	80	56	34	80	50	31	80	41	26	73	35	23	62	31	19	53	27	17	46	23	23	41	21	20
		27-45	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	77	77	77	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	80	66	37	80	57	33	80	49	30	80	43	27	77	39	24	69	36	22	63	32	20	52	27	17	44	23	22	38	20	19	33	18	17	29	15	15	26	21	13
		7-27	80	68	40	80	59	36	80	52	32	80	46	29	80	41	26	77	38	24	70	34	22	58	29	18	49	25	16	42	21	21	37	19	18	32	16	16	28	22	14
		27-45	83	83	83	80	80	80	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	80	52	31	80	45	28	79	40	25	70	36	23	63	33	20	57	30	19	51	27	17	43	23	22	37	20	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	80	55	34	80	48	30	80	42	27	79	38	24	71	34	22	64	31	20	58	29	18	48	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	19	12
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
10	B	0-7	57	57	57	57	57	50	57	57	43	57	57	39	57	57	35	57	53	32	57	48	29	57	39	24	57	33	21	55	29	18	48	25	16	41	22	21	37	20	19
		7-27	57	57	57	57	57	53	57	57	47	57	57	42	57	57	38	57	56	34	57	50	31	57	41	26	57	35	23	57	31	19	53	27	17	46	23	23	41	21	20
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	76	76	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	57	57	37	57	57	33	57	49	30	57	43	27	57	39	24	57	36	22	57	32	20	52	27	17	44	23	22	38	20	19	33	18	17	29	15	15	26	21	13
		7-27	57	57	40	57	57	36	57	52	32	57	46	29	57	41	26	57	38	24	57	34	22	55	29	18	49	25	16	42	21	21	37	19	18	32	16	16	28	22	14
		27-45	80	80	80	78	78	78	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	57	52	31	57	45	28	57	40	25	57	36	23	57	33	20	57	30	19	51	27	17	43	23	22	37	20	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	57	55	34	57	48	30	57	42	27	57	38	24	57	34	22	57	31	20	55	29	18	48	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	19	12
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
20	B	0-7	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	39	29	39	39	24	39	33	21	39	29	18	39	25	16	39	22	21	37	20	19
		7-27	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	26	40	35	23	39	31	19	37	27	17	36	23	23	34	21	20
		27-45	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	62	62	59	59	59	54	54	54	50	50	50	45	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	39	39	37	39	39	33	39	39	30	39	39	27	39	39	24	39	36	22	39	32	20	39	27	17	39	23	22	38	20	19	33	18	17	29	15	15	26	21	13
		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	21	33	19	18	31	16	16	28	22	14
		27-45	65	65	65	64	64	64	60	60	60	57	57	57	54	54	54	51	51	51	49	49	49	44	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	39	39	31	39	39	28	39	39	25	39	36	23	39	33	20	39	30	19	39	27	17	39	23	22	37	20	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	40	40	34	40	40	30	40	40	27	40	38	24	40	34	22	39	31	20	38	29	18	36	24	15	34	21	20	32	18	17	31	16	15	27	21	13	24	19	12
		27-45	64	64	64	60	60	60	57	57	57	53	53	53	50	50	50	47	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
30	B	0-7	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	29	38	38	24	38	33	21	38	29	18	38	25	16	38	22	21	37	20	19
		7-27	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	26	40	35	23	39	31	19	37	27	17	36	23	23	34	21	20
		27-45	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	53	53	51	51	51	47	47	47	43	43	43	40	40	40	37	37	37	34	34	34	32	30	30
	C	0-7	38	38	37	38	38	33	38	38	30	38	38	27	38	38	24	38	36	22	38	32	20	38	27	17	38	23	22	38	20	19	33	18	17	29	15	15	26	21	13
		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	21	33	19	18	31	16	16	28	22	14
		27-45	55	55	55	54	54	54	51	51	51	49	49	49	47	47	47	45	45	45	43	43	43	39	39	39	36	35	35	33	31	31	30	27	27	27	24	24	25	21	21
	D	0-7	39	39	31	39	39	28	39	39	25	39	36	23	39	33	20	39	30	19	39	27	17	39	23	22	37	20	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	40	40	34	40	40	30	40	40	27	40	38	24	40	34	22	39	31	20	38	29	18	36	24	15	34	21	20	32	18	17	31	16	15	27	21	13	24	19	12
		27-45	55	55	55	52	52	52	49	49	49	47	47	47	44	44	44	42	42	42	40	40	40	36	35	35	33	30	30	30	26	26	26	22	22	23	20	20	21	17	17
40	B	0-7	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	24	32	32	21	32	29	18	32	25	16	32	22	21	32	20	19
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	26	34	34	23	33	31	19	32	27	17	31	23	23	30	21	20
		27-45	48	48	48	48	48	48	48	48	48	48	48	48	47	47	47	46	46	46	44	44	44	41	41	41	39	39	39	36	36	36	34	34	34	31	31	31	29	29	29
	C	0-7	32	32	32	32	32	32	32	32	30	32	32	27	32	32	24	32	32	22	32	32	20	32	27	17	32	23	22	32	20	19	32	18	17	29	15	15	26	21	13
		7-27	34	34	34	34	34	34	34	34	32	34	34	29	34	34	26	34	34	24	34	34	22	33	29	18	31	25	16	30	21	21	29	19	18	27	16	16	26	22	14
		27-45	48	48	48	46	46	46	45	45	45	43	43	43	41	41	41	40	40	40	38	38	38	35	35	35	32	32	32	30	30	30	28	27	27	25	24	24	24	21	21
	D	0-7	34	34	31	34	34	28	34	34	25	34	34	23	34	33	20	34	30	19	34	27	17	34	23	22	34	20	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	36	36	34	36	36	30	36	36	27	36	36	24	36	34	22	36	31	20	35	29	18	33	24	15	31	21	20	30	18	17	28	16	15	27	21	13	24	19	12
		27-45	48	48	48	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	36	36	36	33	33	33	30	30	30	28	26	26	25	22	22	23	20	20	21	17	17
50	B	0-7	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	26	21	26	26	18	26	25	16	26	22	21	26	20	19
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	23	28	28	19	28	27	17	27	23	23	26	21	20
		27-45	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	40	40	39	39	39	37	37	37	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27
	C	0-7	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	17	26	23	22	26	20	19	26	18	17	26	15	15	26	21	13
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	22	28	28	18	27	25	16	26	21	21	25	19	18	24	16	16	23	22	14
		27-45	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	34	34	34	32	32	32	30	30	30	27	27	27	25	25	25	24	24	24	22	21	21
	D	0-7	29	29	29	29	29	28	29	29	25	29	29	23	29	29	20	29	29	19	29	27	17	29	23	22	29	20	19	29	17	16	27	22	14	24	20	12	21	17	11
		7-27	31	31	31	31	31	30	31	31	27	31	31	24	31	31	22	31	31	20	30	29	18	29	24	15	28	21	20	26	18	17	25	16	15	24	21	13	23	19	12
		27-45	43	43	43	41	41	41	39	39	39	38	38	38	36	36	36	35	35	35	33	33	33	31	31	31	28	28	28	26	26	26	24	22	22	22	20	20	20	17	17

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UNIRAC

ASCE 7-10	II	30 ft	Ss = 3.00	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	22	22	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	16	22	22	21	22	20	19
		7-27	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	19	24	24	17	24	23	23	23	21	20
		27-45	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	54	54	53	53	53	50	50	50	47	47	47	45	45	45	42	42	42	40	40	40	38	38	38
	C	0-7	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	22	22	22	20	19	22	18	17	22	15	15	22	21	13
		7-27	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	18	24	24	16	23	21	21	22	19	18	21	16	16	21	22	14
		27-45	56	56	56	55	55	55	53	53	53	52	52	52	50	50	50	49	49	49	47	47	47	44	44	44	41	41	41	38	38	38	36	36	36	33	33	33	31	31	31
	D	0-7	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	23	22	24	20	19	24	17	16	24	22	14	24	20	12	21	17	11
		7-27	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	18	25	24	15	24	21	20	24	18	17	23	16	15	22	21	13	21	19	12
		27-45	38	38	38	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	31	31	31	28	28	28	26	26	26	24	24	24	22	22	22	21	20	20	19	17	17
70	B	0-7	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	19	19	21	19	19	19
		7-27	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	34	42	42	30	41	40	26	40	35	23	38	31	20
		27-45	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	49	49	48	48	48	46	46	46	44	44	44	41	41	41	39	39	39	37	37	37	35	35	35
	C	0-7	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	22	19	19	19	19	18	17	19	15	15	19	21	13
		7-27	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	36	42	42	33	42	42	28	40	37	24	39	32	21	37	28	18	36	25	16	34	22	14
		27-45	51	51	51	50	50	50	49	49	49	47	47	47	46	46	46	44	44	44	43	43	43	41	41	41	38	38	38	36	36	36	34	34	34	31	31	31	30	30	30
	D	0-7	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	19	21	21	17	21	21	22	21	20	19	21	17	16	21	22	14	21	20	12	21	17	11
		7-27	50	50	50	50	50	45	50	50	41	50	50	37	50	50	33	50	47	30	49	43	28	46	37	23	44	31	20	42	27	17	40	24	15	38	21	13	36	19	12
		27-45	53	53	53	51	51	51	49	49	49	47	47	47	46	46	46	44	44	44	43	43	43	40	40	40	37	37	37	34	34	34	32	32	32	30	30	30	28	27	27
80	B	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	21	16	16	19
		7-27	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	33	26	33	33	23	32	31	20
		27-45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	45	45	44	44	44	42	42	42	40	40	40	38	38	38	37	37	37	35	35	35	33	33	33
	C	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	22	16	16	19	16	16	17	16	15	15	16	21	13
		7-27	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	33	24	33	32	21	32	28	18	31	25	16	30	22	14
		27-45	46	46	46	46	46	46	44	44	44	43	43	43	42	42	42	41	41	41	40	40	40	38	38	38	35	35	35	33	33	33	31	31	31	30	30	30	28	28	28
	D	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	22	18	18	19	18	17	16	18	22	14	18	20	12	18	17	11
		7-27	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	40	30	40	40	28	39	37	23	38	31	20	36	27	17	35	24	15	33	21	13	32	19	12
		27-45	48	48	48	47	47	47	45	45	45	44	44	44	42	42	42	41	41	41	40	40	40	37	37	37	35	35	35	32	32	32	30	30	30	28	28	28	26	26	26
90	B	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	21	15	15	19
		7-27	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	29	23	29	29	20
		27-45	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	31	31	31
	C	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	22	15	15	19	15	15	17	15	15	15	15	21	13
		7-27	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	29	21	29	28	18	28	25	16	27	22	14
		27-45	41	41	41	41	41	41	41	41	41	40	40	40	39	39	39	38	38	38	37	37	37	35	35	35	33	33	33	31	31	31	30	30	30	28	28	28	26	26	26
	D	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	22	16	16	19	16	16	16	16	22	14	16	20	12	16	17	11
		7-27	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	32	23	32	31	20	31	27	17	30	24	15	29	21	13	28	19	12
		27-45	45	45	45	43	43	43	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27	25	25	25
100	B	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	20	13	13	19
		7-27	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	33	26	33	33	23	33	31	20
		27-45	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	53*	52*	52*	52*	55*	55*	55*	54*	54*	54*	56*	56*	56*	35	35	35	33	33	33	32	32	32	31	31	31	29	29	29
	C	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	20	13	13	19	13	13	17	13	13	15	13	20	13
		7-27	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	33	24	33	32	21	32	28	18	31	25	16	30	22	14
		27-45	53*	53*	53*	52*	52*	52*	55*	55*	55*	56*	56*	56*	36	36	36	35	35	35	35	35	35	33	33	33	31	31	31	30	30	30	28	28	28	27	27	27	25	25	25
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	22	15	15	19	15	15	16	15	22	14	15	20	12	15	17	11
		7-27	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	23	29	29	20	29	27	17	28	24	15	27	21	13	26	19	12
		27-45	41	41	41	40	40	40	39	39	39	38	38	38	37	37	37	36	36	36	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27	26	26	26	24	24	24

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UNIRAC

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SPAN TABLES

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			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	98	98	92	98	98	87	98	98	83	98	94	65	98	91	59	98	87	54	98	84	49	97	67	41	91	56	35	87	49	31	81	42	27	70	37	36	62	33	32
		7-27	99	99	90	99	99	86	99	99	82	99	95	71	99	91	63	99	88	58	99	85	53	99	72	44	95	60	38	90	51	33	86	45	29	79	40	38	69	35	34
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	98	93	63	98	89	56	98	85	50	98	78	45	96	66	41	93	60	37	90	55	34	85	46	29	75	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	99	94	68	99	90	60	99	86	54	99	82	49	99	71	44	97	63	40	94	58	37	88	49	31	83	42	27	71	36	35	62	32	31	54	28	27	48	37	24
		27-45	99	99	99	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	98	87	53	98	82	47	97	69	42	94	61	38	90	55	34	87	50	31	85	46	29	73	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	99	87	57	99	84	51	99	74	45	97	64	41	94	58	37	91	53	34	88	48	31	82	41	26	69	35	34	59	30	29	52	26	26	45	35	23	40	31	20
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
10	B	0-7	88	88	88	88	88	87	88	88	83	88	88	65	88	88	59	88	87	54	88	84	49	88	67	41	88	56	35	87	49	31	81	42	27	70	37	36	62	33	32
		7-27	88	88	88	88	88	86	88	88	82	88	88	71	88	88	63	88	88	58	88	85	53	88	72	44	88	60	38	88	51	33	86	45	29	79	40	38	69	35	34
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	88	88	63	88	88	56	88	85	50	88	78	45	88	66	41	88	60	37	88	55	34	85	46	29	75	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	88	88	68	88	88	60	88	86	54	88	82	49	88	71	44	88	63	40	88	58	37	88	49	31	83	42	27	71	36	35	62	32	31	54	28	27	48	37	24
		27-45	98	98	98	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	88	87	53	88	82	47	88	69	42	88	61	38	88	55	34	87	50	31	85	46	29	73	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	88	87	57	88	84	51	88	74	45	88	64	41	88	58	37	88	53	34	88	48	31	82	41	26	69	35	34	59	30	29	52	26	26	45	35	23	40	31	20
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
20	B	0-7	66	66	66	66	66	66	66	66	66	66	66	65	66	66	59	66	66	54	66	66	49	66	66	41	66	56	35	66	49	31	66	42	27	66	37	36	62	33	32
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	38	58	35	34
		27-45	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	91	91	89	89	89	87	87	87	84	84	84	76	75	75	70	64	64	63	56	56	57	50	50
	C	0-7	66	66	63	66	66	56	66	66	50	66	66	45	66	66	41	66	60	37	66	55	34	66	46	29	66	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	35	55	32	31	52	28	27	48	37	24
		27-45	92	92	92	91	91	91	90	90	90	88	88	88	87	87	87	85	85	85	82	82	82	74	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	34	54	30	29	51	26	26	45	35	23	40	31	20
		27-45	92	92	92	90	90	90	88	88	88	86	86	86	85	84	84	80	78	78	75	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
30	B	0-7	64	64	64	64	64	64	64	64	64	64	64	64	64	64	59	64	64	54	64	64	49	64	64	41	64	56	35	64	49	31	64	42	27	64	37	36	62	33	32
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	38	58	35	34
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	86	86	85	85	85	79	79	79	73	73	73	67	67	67	62	62	62	58	56	56	54	50	50
	C	0-7	64	64	63	64	64	56	64	64	50	64	64	45	64	64	41	64	60	37	64	55	34	64	46	29	64	39	37	64	34	32	55	30	28	49	26	25	43	35	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	35	55	32	31	52	28	27	48	37	24
		27-45	87	87	87	86	86	86	85	85	85	82	82	82	79	79	79	75	75	75	72	72	72	65	65	65	60	60	60	55	52	52	50	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	37	62	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	34	54	30	29	51	26	26	45	35	23	40	31	20
		27-45	87	87	87	86	86	86	83	83	83	79	79	79	75	75	75	71	71	71	67	67	67	61	58	58	55	50	50	50	43	43	44	38	38	39	33	33	35	30	30
40	B	0-7	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	53	35	53	49	31	53	42	27	53	37	36	53	33	32
		7-27	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	53	56	56	44	56	56	38	55	51	33	53	45	29	52	40	38	50	35	34
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	77	77	77	74	74	74	69	69	69	64	64	64	60	60	60	56	56	56	53	53	53	49	49	49
	C	0-7	53	53	53	53	53	53	53	53	50	53	53	45	53	53	41	53	53	37	53	53	34	53	46	29	53	39	37	53	34	32	53	30	28	49	26	25	43	35	22
		7-27	56	56	56	56	56	56	56	56	54	56	56	49	56	56	44	56	56	40	56	56	37	55	49	31	52	42	27	50	36	35	48	32	31	46	28	27	44	37	24
		27-45	80	80	80	78	78	78	75	75	75	72	72	72	69	69	69	66	66	66	64	64	64	59	59	59	54	54	54	50	50	50	46	45	45	43	40	40	40	35	35
	D	0-7	57	57	53	57	57	47	57	57	42	57	57	38	57	55	34	57	50	31	57	46	29	57	39	37	57	33	31	53	29	27	46	38	24	41	33	21	36	30	19
		7-27	60	60	57	60	60	51	60	60	45	60	60	41	60	58	37	60	53	34	58	48	31	55	41	26	53	35	34	50	30	29	47	26	26	45	35	23	40	31	20
		27-45	80	80	80	77	77	77	73	73	73	70	70	70	67	67	67	64	64	64	61	61	61	56	56	56	51	50	50	46	43	43	43	38	38	39	33	33	35	30	30
50	B	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	35	43	43	31	43	42	27	43	37	36	43	33	32
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	38	47	47	33	46	45	29	45	40	38	43	35	34
		27-45	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	68	68	66	66	66	62	62	62	58	58	58	55	55	55	51	51	51	48	48	48	45	45	45
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	37	43	43	34	43	43	29	43	39	37	43	34	32	43	30	28	43	26	25	43	35	22
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	40	47	47	37	47	47	31	45	42	27	44	36	35	42	32	31	40	28	27	39	37	24
		27-45	70	70	70	69	69	69	66	66	66	64	64	64	62	62	62	59	59	59	57	57	57	53	53	53	50	50	50	46	46	46	43	43	43	40	40	40	37	35	35
	D	0-7	48	48	48	48	48	47	48	48	42	48	48	38	48	48	34	48	48	31	48	46	29	48	39	37	48	33	31	48	29	27	46	38	24	41	33	21	36	30	19
		7-27	52	52	52	52	52	51	52	52	45	52	52	41	52	52	37	51	51	34	50	48	31	48	41	26	46	35	34	44	30	29	42	26	26	40	35	23	38	31	20
		27-45	71	71	71	69	69	69	66	66	66	63	63	63	60	60	60	58	58	58	56	56	56	51	51	51	47	47	47	43	43	43	40	38	38	37	33	33	34	30	30

* 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 7-10	II	30 ft	Ss = 3.00	18.66 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	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	31	37	37	27	37	37	36	37	33	32
		7-27	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	68	85	85	57	85	83	50	84	69	44	81	60	38	78	53	34
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	86	86	85	85	85	80	80	80	75	75	75	71	71	71	67	67	67	63	63	63
	C	0-7	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	29	37	37	37	37	34	32	37	30	28	37	26	25	37	35	22
		7-27	85	85	85	85	85	85	85	85	84	85	85	76	85	85	67	85	85	61	85	85	56	85	77	47	82	63	40	78	54	35	75	48	31	71	42	27	67	37	24
		27-45	87	87	87	87	87	87	86	86	86	85	85	85	84	84	84	82	82	82	79	79	79	74	74	74	69	69	69	64	64	64	60	60	60	56	56	56	52	52	52
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	29	40	39	37	40	33	31	40	29	27	40	38	24	40	33	21	36	30	19
		7-27	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	34	44	44	31	43	41	26	41	35	34	39	30	29	38	26	26	36	35	23	35	31	20
		27-45	64	64	64	62	62	62	60	60	60	58	58	58	55	55	55	53	53	53	51	51	51	47	47	47	44	44	44	41	41	41	38	38	38	35	33	33	32	30	30
70	B	0-7	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	31	32	32	27	32	32	36	32	32	32
		7-27	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	69	50	69	69	44	66	60	38	64	53	34
		27-45	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	77	77	73	73	73	69	69	69	66	66	66	62	62	62	59	59	59
	C	0-7	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	37	32	32	32	32	30	28	32	26	25	32	35	22
		7-27	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	61	69	69	56	69	69	47	67	63	40	65	54	35	62	48	31	60	42	27	58	37	24
		27-45	81	81	81	81	81	81	81	81	81	79	79	79	77	77	77	75	75	75	72	72	72	68	68	68	64	64	64	60	60	60	56	56	56	53	53	53	49	49	49
	D	0-7	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	35	29	35	35	37	35	33	31	35	29	27	35	38	24	35	33	21	35	30	19
		7-27	84	84	84	84	84	80	84	84	69	84	84	62	84	84	56	84	84	51	83	76	47	79	62	40	75	53	34	71	46	29	67	40	26	64	35	23	61	31	20
		27-45	85	85	85	85	85	85	83	83	83	80	80	80	77	77	77	74	74	74	72	72	72	66	66	66	62	62	62	58	58	58	54	54	54	50	50	50	46	45	45
80	B	0-7	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	36	28	28	32
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	44	55	55	38	54	53	34
		27-45	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	74	74	71	71	71	67	67	67	64	64	64	61	61	61	58	58	58	55	55	55
	C	0-7	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	37	28	28	32	28	28	28	28	26	25	28	35	22
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	40	55	54	35	53	48	31	51	42	27	49	37	24
		27-45	76	76	76	76	76	76	75	75	75	73	73	73	71	71	71	69	69	69	67	67	67	63	63	63	59	59	59	56	56	56	53	53	53	50	50	50	47	47	47
	D	0-7	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	37	31	31	31	31	29	27	31	38	24	31	33	21	31	30	19
		7-27	68	68	68	68	68	68	68	68	68	68	68	62	68	68	56	68	68	51	68	68	47	66	62	40	63	53	34	60	46	29	58	40	26	55	35	23	53	31	20
		27-45	80	80	80	79	79	79	76	76	76	74	74	74	71	71	71	69	69	69	67	67	67	62	62	62	58	58	58	54	54	54	51	51	51	47	47	47	44	44	44
90	B	0-7	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	25	25	25	25	25	25	25	25	25	36	25	25	32
		7-27	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	38	44	44	34
		27-45	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	68	68	65	65	65	63	63	63	60	60	60	57	57	57	55	55	55	52	52	52
	C	0-7	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	37	25	25	32	25	25	28	25	25	25	25	35	22
		7-27	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	40	44	44	35	44	44	31	44	42	27	43	37	24
		27-45	69	69	69	69	69	69	69	69	69	67	67	67	65	65	65	64	64	64	62	62	62	59	59	59	56	56	56	53	53	53	50	50	50	47	47	47	44	44	44
	D	0-7	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	37	27	27	31	27	27	27	27	38	24	27	33	21	27	30	19
		7-27	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	47	54	54	40	54	53	34	52	46	29	50	40	26	48	35	23	46	31	20
		27-45	75	75	75	73	73	73	70	70	70	68	68	68	66	66	66	64	64	64	62	62	62	59	59	59	55	55	55	51	51	51	48	48	48	45	45	45	42	42	42
100	B	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	34	22	22	32
		7-27	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	44	50	50	38	50	50	34
		27-45	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	61	61	61	58	58	58	56	56	56	54	54	54	51	51	51	49	49	49
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	34	22	22	32	22	22	28	22	22	25	22	34	22
		7-27	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	40	50	50	35	49	48	31	48	42	27	46	37	24
		27-45	63	63	63	63	63	63	63	63	63	62	62	62	61	61	61	59	59	59	58	58	58	55	55	55	52	52	52	50	50	50	47	47	47	45	45	45	42	42	42
	D	0-7	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	37	25	25	31	25	25	27	25	37	24	25	33	21	25	30	19
		7-27	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	44	34	44	44	29	43	40	26	42	35	23	41	31	20
		27-45	69	69	69	67	67	67	66	66	66	64	64	64	62	62	62	60	60	60	59	59	59	55	55	55	52	52	52	49	49	49	46	46	46	43	43	43	41	41	41

* 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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	67	67	50	67	67	42	67	66	36	67	57	32	67	50	29	67	45	27	67	40	24	64	33	20	54	28	17	46	24	15	40	21	20	35	18	18	31	16	16
		7-27	67	67	50	67	67	44	67	67	39	67	59	35	67	53	31	67	47	29	67	42	26	67	35	22	61	30	19	52	26	16	44	22	22	39	20	19	34	17	17
		27-45	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	64	64	60	60	60	52	51	51	45	43	43	40	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	67	55	31	67	47	28	67	41	25	67	36	22	64	33	20	58	30	19	52	27	17	43	23	22	37	19	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	67	57	34	67	50	30	67	44	27	67	39	24	67	34	22	65	31	20	59	29	18	49	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	18	12
		27-45	69	69	69	67	67	67	61	61	61	56	56	56	52	51	51	48	46	46	44	41	41	38	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
	D	0-7	67	44	26	67	38	23	66	33	21	59	30	19	53	27	17	47	25	15	43	23	21	36	19	18	31	16	16	26	21	13	23	19	12	20	16	10	18	15	9
		7-27	67	46	28	67	40	25	67	35	22	66	32	20	59	29	18	53	26	17	48	24	23	40	20	20	34	17	17	29	23	14	26	20	13	22	17	11	20	15	10
		27-45	63	63	63	58	58	58	53	52	52	48	47	47	44	42	42	41	38	38	38	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	22	22
10	B	0-7	47	47	47	47	47	42	47	47	36	47	47	32	47	47	29	47	45	27	47	40	24	47	33	20	47	28	17	46	24	15	40	21	20	35	18	18	31	16	16
		7-27	48	48	48	48	48	44	48	48	39	48	48	35	48	48	31	48	47	29	48	42	26	48	35	22	48	30	19	47	26	16	44	22	22	39	20	19	34	17	17
		27-45	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	63	63	60	60	60	52	51	51	45	43	43	40	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	47	47	31	47	47	28	47	41	25	47	36	22	47	33	20	47	30	19	47	27	17	43	23	22	37	19	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	48	48	34	48	48	30	48	44	27	48	39	24	48	34	22	48	31	20	48	29	18	46	24	15	41	21	20	35	18	17	31	16	15	27	21	13	24	18	12
		27-45	67	67	67	65	65	65	61	61	61	56	56	56	52	51	51	48	46	46	44	41	41	38	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
	D	0-7	47	44	26	47	38	23	47	33	21	47	30	19	47	27	17	47	25	15	43	23	21	36	19	18	31	16	16	26	21	13	23	19	12	20	16	10	18	15	9
		7-27	48	46	28	48	40	25	48	35	22	48	32	20	48	29	18	48	26	17	46	24	23	40	20	20	34	17	17	29	23	14	26	20	13	22	17	11	20	15	10
		27-45	63	63	63	58	58	58	53	52	52	48	47	47	44	42	42	41	38	38	38	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	22	22
20	B	0-7	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	27	33	33	24	33	33	20	33	28	17	33	24	15	33	21	20	33	18	18	31	16	16
		7-27	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	26	33	33	22	33	30	19	33	26	16	31	22	22	30	20	19	29	17	17
		27-45	55	55	55	55	55	55	55	55	55	55	55	55	54	54	54	52	52	52	50	50	50	45	45	45	41	41	41	38	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	33	33	31	33	33	28	33	33	25	33	33	22	33	33	20	33	30	19	33	27	17	33	23	22	33	19	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	33	33	33	33	33	30	33	33	27	33	33	24	33	33	22	33	31	20	33	29	18	32	24	15	31	21	20	29	18	17	28	16	15	26	21	13	24	18	12
		27-45	55	55	55	53	53	53	50	50	50	48	48	48	45	45	45	43	43	43	41	41	41	37	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
	D	0-7	33	33	26	33	33	23	33	33	21	33	30	19	33	27	17	33	25	15	33	23	21	33	19	18	31	16	16	26	21	13	23	19	12	20	16	10	18	15	9
		7-27	33	33	28	33	33	25	33	33	22	33	32	20	33	29	18	33	26	17	32	24	23	30	20	20	29	17	17	27	23	14	26	20	13	22	17	11	20	15	10
		27-45	53	53	53	50	50	50	47	47	47	45	45	45	42	42	42	40	38	38	37	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	22	22
30	B	0-7	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	27	32	32	24	32	32	20	32	28	17	32	24	15	32	21	20	32	18	18	31	16	16
		7-27	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	26	33	33	22	33	30	19	33	26	16	31	22	22	30	20	19	29	17	17
		27-45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	44	44	42	42	42	39	39	39	36	36	36	34	34	34	31	31	31	29	28	28	27	25	25
	C	0-7	32	32	31	32	32	28	32	32	25	32	32	22	32	32	20	32	30	19	32	27	17	32	23	22	32	19	19	32	17	16	27	22	14	24	20	12	21	17	11
		7-27	33	33	33	33	33	30	33	33	27	33	33	24	33	33	22	33	31	20	33	29	18	32	24	15	31	21	20	29	18	17	28	16	15	26	21	13	24	18	12
		27-45	46	46	46	45	45	45	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	33	33	33	30	30	30	27	26	26	25	22	22	23	20	20	21	17	17
	D	0-7	33	33	26	33	33	23	33	33	21	33	30	19	33	27	17	33	25	15	33	23	21	33	19	18	31	16	16	26	21	13	23	19	12	20	16	10	18	15	9
		7-27	33	33	28	33	33	25	33	33	22	33	32	20	33	29	18	33	26	17	32	24	23	30	20	20	29	17	17	27	23	14	26	20	13	22	17	11	20	15	10
		27-45	46	46	46	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	33	33	33	30	29	29	27	25	25	25	21	21	22	19	19	19	16	16	17	22	22
40	B	0-7	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	26	17	26	24	15	26	21	20	26	18	18	26	16	16
		7-27	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	28	19	28	26	16	27	22	22	26	20	19	25	17	17
		27-45	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	38	38	37	37	37	34	34	34	32	32	32	30	30	30	28	28	28	26	26	26	24	24	24
	C	0-7	26	26	26	26	26	26	26	26	25	26	26	22	26	26	20	26	26	19	26	26	17	26	23	22	26	19	19	26	17	16	26	22	14	24	20	12	21	17	11
		7-27	28	28	28	28	28	28	28	28	27	28	28	24	28	28	22	28	28	20	28	28	18	27	24	15	26	21	20	25	18	17	24	16	15	23	21	13	22	18	12
		27-45	40	40	40	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	29	29	29	27	27	27	25	25	25	23	22	22	21	20	20	20	17	17
	D	0-7	28	28	26	28	28	23	28	28	21	28	28	19	28	27	17	28	25	15	28	23	21	28	19	18	28	16	16	26	21	13	23	19	12	20	16	10	18	15	9
		7-27	30	30	28	30	30	25	30	30	22	30	30	20	30	29	18	30	26	17	29	24	23	28	20	20	26	17	17	25	23	14	24	20	13	22	17	11	20	15	10
		27-45	40	40	40	38	38	38	37	37	37	35	35	35	33	33	33	32	32	32	30	30	30	28	28	28	25	25	25	23	21	21	21	19	19	19	16	16	17	22	22
50	B	0-7	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	22	15	22	21	20	22	18	18	22	16	16
		7-27	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	43	49	49	39	49	49	33	49	45	28	48	39	25	46	34	22	44	30	19	42	26	17
		27-45	53	53	53	53	53	53	53	53	53	53	53	53	52	52	52	51	51	51	49	49	49	46	46	46	44	44	44	41	41	41	39	39	39	36	36	36	34	34	34
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	19	22	22	17	22	22	22	22	19	19	22	17	16	22	22	14	22	20	12	21	17	11
		7-27	49	49	49	49	49	45	49	49	41	49	49	37	49	49	33	49	47	30	49	43	28	47	36	23	45	31	20	43	27	17	41	24	15	39	21	13	36	18	12
		27-45	53	53	53	51	51	51	50	50	50	48	48	48	46	46	46	45	45	45	43	43	43	40	40	40	37	37	37	35	35	35	32	32	32	30	30	30	28	26	26
	D	0-7	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	24	15	24	23	21	24	19	18	24	16	16	24	21	13	23	19	12	20	16	10	18	15	9
		7-27	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	26	17	25	24	23	24	20	20	23	17	17	22	23	14	21	20	13	20	17	11	19	15	10
		27-45	36	36	36	34	34	34	33	33	33	31	31	31	30	30	30	29	29	29	28	28	28	25	25	25	23	23	23	22	21	21	20	19	19	18	16	16	17	22	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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	PORTRAIT	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	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	15	18	18	20	18	18	18	18	16	16
		7-27	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	36	28	36	36	25	35	34	22	34	30	19	33	26	17
		27-45	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	35	35	35	33	33	33	32	32	32
	C	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	22	18	18	19	18	17	16	18	22	14	18	20	12	18	17	11
		7-27	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	36	28	36	36	23	35	31	20	33	27	17	32	24	15	31	21	13	29	18	12
		27-45	47	47	47	46	46	46	45	45	45	43	43	43	42	42	42	41	41	41	39	39	39	37	37	37	34	34	34	32	32	32	30	30	30	28	28	28	26	26	26
	D	0-7	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	15	20	20	21	20	19	18	20	16	16	20	21	13	20	19	12	20	16	10	18	15	9
		7-27	43	43	42	43	43	38	43	43	34	43	43	31	43	43	28	42	40	25	41	36	23	40	31	20	38	26	17	36	23	14	34	20	13	32	17	11	30	15	10
		27-45	48	48	48	47	47	47	45	45	45	43	43	43	42	42	42	40	40	40	38	38	38	36	36	36	33	33	33	31	31	31	28	28	28	26	25	25	24	22	22
70	B	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	20	16	16	18	16	16	16
		7-27	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	31	31	22	31	30	19	30	26	17
		27-45	43	43	43	43	43	43	43	43	43	43	43	43	42	42	42	41	41	41	40	40	40	38	38	38	36	36	36	35	35	35	33	33	33	31	31	31	29	29	29
	C	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	22	16	16	19	16	16	16	16	22	14	16	20	12	16	17	11
		7-27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	28	31	31	23	31	31	20	30	27	17	29	24	15	28	21	13	27	18	12
		27-45	43	43	43	42	42	42	41	41	41	39	39	39	38	38	38	37	37	37	36	36	36	34	34	34	32	32	32	30	30	30	28	28	28	26	26	26	25	25	25
	D	0-7	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	21	17	17	18	17	16	16	17	21	13	17	19	12	17	16	10	17	15	9
		7-27	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	25	34	34	23	33	31	20	32	26	17	31	23	14	29	20	13	28	17	11	27	15	10
		27-45	44	44	44	43	43	43	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	33	33	33	31	31	31	29	29	29	27	27	27	25	25	25	23	22	22
80	B	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	20	14	14	18	14	14	16
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	28	34	34	25	34	34	22	33	30	19	32	26	17
		27-45	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	38	38	37	37	37	35	35	35	34	34	34	32	32	32	31	31	31	29	29	29	28	28	28
	C	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	21	14	14	19	14	14	16	14	21	14	14	20	12	14	17	11
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	30	34	34	28	34	34	23	33	31	20	32	27	17	31	24	15	30	21	13	29	18	12
		27-45	39	39	39	38	38	38	37	37	37	36	36	36	35	35	35	34	34	34	33	33	33	31	31	31	30	30	30	28	28	28	26	26	26	25	25	25	23	23	23
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	21	15	15	18	15	15	16	15	21	13	15	19	12	15	16	10	15	15	9
		7-27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	30	23	30	30	20	29	26	17	28	23	14	27	20	13	26	17	11	25	15	10
		27-45	44	44	44	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	33	33	33	31	31	31	29	29	29	27	27	27	25	25	25	23	22	22
90	B	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	19	12	12	18	12	12	16
		7-27	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	27	27	22	27	27	19	27	26	17
		27-45	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	51*	51*	51*	50*	50*	50*	52*	52*	52*	33	33	33	31	31	31	30	30	30	29	29	29	27	27	27	26	26	26
	C	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	19	12	12	19	12	12	16	12	19	14	12	19	12	12	17	11
		7-27	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	27	17	26	24	15	25	21	13	25	18	12
		27-45	52*	52*	52*	50*	50*	50*	53*	53*	53*	33	33	33	33	33	33	32	32	32	31	31	31	29	29	29	28	28	28	26	26	26	25	25	25	23	23	23	22	22	22
	D	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	21	14	14	18	14	14	16	14	21	13	14	19	12	14	16	10	14	15	9
		7-27	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	25	34	34	23	33	31	20	32	26	17	30	23	14	29	20	13	28	17	11	27	15	10
		27-45	37	37	37	36	36	36	35	35	35	34	34	34	33	33	33	32	32	32	31	31	31	29	29	29	27	27	27	26	26	26	24	24	24	23	23	23	21	21	21
100	B	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	17	11	11	17	11	11	16
		7-27	22	22	22	22	22	22	22	22	22	22	22	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
		27-45	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	47*	47*	47*	45*	45*	45*	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24
	C	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	17	11	11	17	11	11	16	11	17	14	11	17	12	11	17	11
		7-27	22	22	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	22	15	22	21	13	21	18	12
		27-45	44*	44*	44*	47*	47*	47*	46*	46*	46*	48*	48*	48*	30	30	30	30	30	30	29	29	29	27	27	27	26	26	26	25	25	25	23	23	23	22	22	22	21	21	21
	D	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	19	12	12	18	12	12	16	12	19	13	12	19	12	12	16	10	12	15	9
		7-27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	20	27	26	17	26	23	14	25	20	13	24	17	11	23	15	10
		27-45	54*	54*	54*	52*	52*	52*	33	33	33	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	26	26	26	24	24	24	23	23	23	22	22	22	20	20	20

* 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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	98	98	91	98	98	86	98	98	80	98	94	64	98	90	58	98	86	52	98	83	48	96	65	40	91	55	35	86	48	30	79	42	39	69	37	35	60	32	31
		7-27	98	98	89	98	98	85	98	98	79	98	94	69	98	90	62	98	87	56	98	84	52	98	69	43	94	58	37	89	50	32	85	44	42	77	39	37	67	34	33
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	98	92	62	98	88	55	98	84	49	98	75	44	96	64	40	92	59	37	89	53	34	84	45	28	73	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	98	93	67	98	89	59	98	85	53	98	79	48	98	69	43	96	62	39	93	56	36	87	48	31	82	41	39	70	35	34	60	31	30	53	41	26	47	36	23
		27-45	99	99	99	98	98	98	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	98	86	52	98	79	46	97	66	41	93	59	37	90	54	34	87	49	31	84	45	28	71	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	98	87	55	98	83	49	98	71	44	97	63	40	93	57	36	90	52	33	87	47	30	80	40	39	67	34	33	58	30	29	50	39	25	44	34	22	39	31	20
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	44	44
10	B	0-7	87	87	87	87	87	86	87	87	80	87	87	64	87	87	58	87	86	52	87	83	48	87	65	40	87	55	35	86	48	30	79	42	39	69	37	35	60	32	31
		7-27	87	87	87	87	87	85	87	87	79	87	87	69	87	87	62	87	87	56	87	84	52	87	69	43	87	58	37	87	50	32	85	44	42	77	39	37	67	34	33
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	87	87	62	87	87	55	87	84	49	87	75	44	87	64	40	87	59	37	87	53	34	84	45	28	73	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	87	87	67	87	87	59	87	85	53	87	79	48	87	69	43	87	62	39	87	56	36	87	48	31	82	41	39	70	35	34	60	31	30	53	41	26	47	36	23
		27-45	98	98	98	97	97	97	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	87	86	52	87	79	46	87	66	41	87	59	37	87	54	34	87	49	31	84	45	28	71	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	87	87	55	87	83	49	87	71	44	87	63	40	87	57	36	87	52	33	87	47	30	80	40	39	67	34	33	58	30	29	50	39	25	44	34	22	39	31	20
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	44	44
20	B	0-7	64	64	64	64	64	64	64	64	64	64	64	64	64	64	58	64	64	52	64	64	48	64	64	40	64	55	35	64	48	30	64	42	39	64	37	35	60	32	31
		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	42	59	39	37	56	34	33
		27-45	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	90	90	89	89	89	86	86	86	82	82	82	75	73	73	68	63	63	62	55	55	55	49	49
	C	0-7	64	64	62	64	64	55	64	64	49	64	64	44	64	64	40	64	59	37	64	53	34	64	45	28	64	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	39	57	35	34	54	31	30	51	41	26	47	36	23
		27-45	91	91	91	91	91	91	89	89	89	88	88	88	86	86	86	84	84	84	80	80	80	72	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	39	56	34	33	53	30	29	50	39	25	44	34	22	39	31	20
		27-45	91	91	91	89	89	89	87	87	87	86	86	86	83	83	83	78	76	76	73	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	44	44
30	B	0-7	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	52	63	63	48	63	63	40	63	55	35	63	48	30	63	42	39	63	37	35	60	32	31
		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	42	59	39	37	56	34	33
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	83	83	83	77	77	77	71	71	71	66	66	66	61	61	61	56	55	55	52	49	49
	C	0-7	63	63	62	63	63	55	63	63	49	63	63	44	63	63	40	63	59	37	63	53	34	63	45	28	63	39	37	62	33	32	54	29	28	48	39	24	42	34	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	39	57	35	34	54	31	30	51	41	26	47	36	23
		27-45	86	86	86	86	86	86	84	84	84	80	80	80	77	77	77	73	73	73	70	70	70	64	64	64	58	58	58	53	50	50	49	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	36	60	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	39	56	34	33	53	30	29	50	39	25	44	34	22	39	31	20
		27-45	86	86	86	85	85	85	81	81	81	77	77	77	73	73	73	69	69	69	65	65	65	59	57	57	54	49	49	49	42	42	43	37	37	38	33	33	34	44	44
40	B	0-7	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	40	52	52	35	52	48	30	52	42	39	52	37	35	52	32	31
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	43	55	55	37	54	50	32	52	44	42	50	39	37	49	34	33
		27-45	78	78	78	78	78	78	78	78	78	78	78	78	77	77	77	75	75	75	72	72	72	68	68	68	63	63	63	59	59	59	55	55	55	51	51	51	48	48	48
	C	0-7	52	52	52	52	52	52	52	52	49	52	52	44	52	52	40	52	52	37	52	52	34	52	45	28	52	39	37	52	33	32	52	29	28	48	39	24	42	34	22
		7-27	55	55	55	55	55	55	55	55	53	55	55	48	55	55	43	55	55	39	55	55	36	53	48	31	51	41	39	49	35	34	47	31	30	45	41	26	43	36	23
		27-45	78	78	78	76	76	76	73	73	73	70	70	70	67	67	67	65	65	65	62	62	62	57	57	57	53	53	53	49	49	49	45	44	44	42	39	39	39	34	34
	D	0-7	56	56	52	56	56	46	56	56	41	56	56	37	56	54	34	56	49	31	56	45	28	56	38	36	56	32	31	52	42	27	45	37	23	40	33	21	35	29	18
		7-27	59	59	55	59	59	49	59	59	44	59	59	40	59	57	36	58	52	33	57	47	30	54	40	39	52	34	33	49	30	29	46	39	25	44	34	22	39	31	20
		27-45	79	79	79	75	75	75	72	72	72	68	68	68	65	65	65	62	62	62	59	59	59	54	54	54	50	49	49	45	42	42	42	37	37	38	33	33	34	44	44
50	B	0-7	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	43	35	43	43	30	43	42	39	43	37	35	43	32	31
		7-27	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	88	82	88	88	66	88	87	56	88	80	49	87	67	43	86	58	37	85	52	33
		27-45	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	89	89	89	89	89	89	87	87	87	85	85	85	81	81	81	76	76	76	71	71	71	67	67	67
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	43	34	43	43	28	43	39	37	43	33	32	43	29	28	43	39	24	42	34	22
		7-27	88	88	88	88	88	87	88	88	83	88	88	74	88	88	65	88	88	60	88	86	54	88	75	46	87	62	40	85	53	34	82	47	30	77	41	26	71	36	23
		27-45	90	90	90	90	90	90	89	89	89	88	88	88	87	87	87	86	86	86	85	85	85	79	79	79	73	73	73	68	68	68	63	63	63	58	58	58	54	52	52
	D	0-7	47	47	47	47	47	46	47	47	41	47	47	37	47	47	34	47	47	31	47	45	28	47	38	36	47	32	31	47	42	27	45	37	23	40	33	21	35	29	18
		7-27	51	51	51	51	51	49	51	51	44	51	51	40	51	51	36	50	50	33	49	47	30	47	40	39	45	34	33	43	30	29	41	39	25	39	34	22	37	31	20
		27-45	93	93	93	92	92	92	91	91	91	89	89	89	88	88	88	87	87	87	86	86	86	80	80	80	73	73	73	67	64	64	61	56	56	56	49	49	52	44	44

* 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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	PRO SERIES	SM BUTYL OSB
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)	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	36	36	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	30	36	36	39	36	36	35	36	32	31
		7-27	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	70	56	70	70	49	69	67	43	67	58	38	64	52	33
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	83	83	83	78	78	78	74	74	74	69	69	69	65	65	65	62	62	62
	C	0-7	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	28	36	36	37	36	33	32	36	29	28	36	39	24	36	34	22
		7-27	70	70	70	70	70	70	70	70	70	70	70	70	70	70	65	70	70	60	70	70	54	70	70	46	68	62	40	65	53	34	62	47	30	60	41	26	58	36	23
		27-45	86	86	86	86	86	86	86	86	86	85	85	85	82	82	82	80	80	80	77	77	77	72	72	72	67	67	67	63	63	63	59	59	59	55	55	55	51	51	51
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	40	28	40	38	36	40	32	31	40	42	27	40	37	23	39	33	21	35	29	18
		7-27	84	84	84	84	84	77	84	84	67	84	84	60	84	84	55	84	83	50	83	74	46	79	60	39	75	52	33	71	45	29	67	39	25	63	34	22	59	31	20
		27-45	88	88	88	87	87	87	86	86	86	85	85	85	82	82	82	79	79	79	76	76	76	70	70	70	64	64	64	60	60	60	55	55	55	51	49	49	48	44	44
70	B	0-7	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	30	31	31	39	31	31	35	31	31	31
		7-27	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	56	61	61	49	61	61	43	60	58	38	58	52	33
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	75	75	75	71	71	71	68	68	68	64	64	64	61	61	61	58	58	58
	C	0-7	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	37	31	31	32	31	29	28	31	39	24	31	34	22
		7-27	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	54	61	61	46	61	61	40	59	53	34	57	47	30	55	41	26	53	36	23
		27-45	80	80	80	80	80	80	80	80	80	77	77	77	75	75	75	73	73	73	71	71	71	66	66	66	62	62	62	58	58	58	55	55	55	52	52	52	48	48	48
	D	0-7	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	36	34	32	31	34	42	27	34	37	23	34	33	21	34	29	18
		7-27	67	67	67	67	67	67	67	67	67	67	67	60	67	67	55	67	67	50	67	67	46	65	60	39	62	52	33	60	45	29	57	39	25	55	34	22	52	31	20
		27-45	84	84	84	84	84	84	81	81	81	78	78	78	75	75	75	73	73	73	70	70	70	65	65	65	60	60	60	56	56	56	52	52	52	49	49	49	45	44	44
80	B	0-7	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	39	27	27	35	27	27	31
		7-27	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	56	67	67	49	66	66	43	64	58	38	62	52	33
		27-45	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	74	74	72	72	72	69	69	69	66	66	66	63	63	63	60	60	60	57	57	57	54	54	54
	C	0-7	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	37	27	27	32	27	27	28	27	39	24	27	34	22
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	60	67	67	54	67	67	46	65	62	40	63	53	34	60	47	30	58	41	26	56	36	23
		27-45	75	75	75	75	75	75	73	73	73	71	71	71	69	69	69	67	67	67	65	65	65	62	62	62	58	58	58	55	55	55	52	52	52	49	49	49	46	46	46
	D	0-7	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	36	30	30	31	30	42	27	30	37	23	30	33	21	30	29	18
		7-27	59	59	59	59	59	59	59	59	59	59	59	59	59	59	55	59	59	50	59	59	46	59	59	39	57	52	33	55	45	29	53	39	25	51	34	22	49	31	20
		27-45	79	79	79	77	77	77	74	74	74	72	72	72	70	70	70	67	67	67	65	65	65	61	61	61	57	57	57	53	53	53	50	50	50	46	46	46	43	43	43
90	B	0-7	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	37	24	24	35	24	24	31
		7-27	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	43	54	54	38	53	52	33
		27-45	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	67	67	64	64	64	61	61	61	58	58	58	56	56	56	53	53	53	51	51	51
	C	0-7	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	37	24	24	32	24	24	28	24	37	24	24	34	22
		7-27	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	54	40	53	53	34	52	47	30	50	41	26	48	36	23
		27-45	68	68	68	68	68	68	67	67	67	65	65	65	64	64	64	62	62	62	61	61	61	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	43	43	43
	D	0-7	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	36	27	27	31	27	41	27	27	37	23	27	33	21	27	29	18
		7-27	59	59	59	59	59	59	59	59	59	59	59	59	59	59	55	59	59	50	59	59	46	59	59	39	57	52	33	55	45	29	53	39	25	51	34	22	49	31	20
		27-45	73	73	73	71	71	71	69	69	69	67	67	67	65	65	65	63	63	63	61	61	61	57	57	57	54	54	54	50	50	50	47	47	47	44	44	44	42	42	42
100	B	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	33	22	22	33	22	22	31
		7-27	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	44	44	33
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	57	57	57	55	55	55	53	53	53	50	50	50	48	48	48
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	33	22	22	32	22	22	28	22	33	24	22	33	22
		7-27	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	40	44	44	34	44	44	30	43	41	26	42	36	23
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	58	58	58	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	44	44	44	41	41	41
	D	0-7	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	36	24	24	31	24	37	27	24	37	23	24	33	21	24	29	18
		7-27	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	50	54	54	46	54	54	39	53	52	33	51	45	29	49	39	25	47	34	22	46	31	20
		27-45	68	68	68	66	66	66	64	64	64	62	62	62	61	61	61	59	59	59	57	57	57	54	54	54	51	51	51	48	48	48	45	45	45	42	42	42	40	40	40

* 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 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	80	80	60	80	80	50	80	79	43	80	69	39	80	60	35	80	53	32	80	48	29	77	39	24	65	33	21	55	29	18	48	25	16	41	22	14	37	20	12
		7-27	80	80	60	80	80	53	80	80	47	80	71	42	80	63	38	80	56	34	80	50	31	80	41	26	73	35	23	62	31	19	53	27	17	46	23	15	41	21	13
		27-45	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	77	77	77	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	80	66	37	80	57	33	80	49	30	80	43	27	77	39	24	69	36	22	63	32	20	52	27	17	44	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	80	68	40	80	59	36	80	52	32	80	46	29	80	41	26	77	38	24	70	34	22	58	29	18	49	25	16	42	21	14	37	19	18	32	16	16	28	15	14
		27-45	83	83	83	80	80	80	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	80	52	31	80	45	28	79	40	25	70	36	23	63	33	20	57	30	19	51	27	17	43	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	80	55	34	80	48	30	80	42	27	79	38	24	71	34	22	64	31	20	58	29	18	48	24	15	41	21	13	35	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
10	B	0-7	57	57	57	57	57	50	57	57	43	57	57	39	57	57	35	57	53	32	57	48	29	57	39	24	57	33	21	55	29	18	48	25	16	41	22	14	37	20	12
		7-27	57	57	57	57	57	53	57	57	47	57	57	42	57	57	38	57	56	34	57	50	31	57	41	26	57	35	23	57	31	19	53	27	17	46	23	15	41	21	13
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	76	76	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	57	57	37	57	57	33	57	49	30	57	43	27	57	39	24	57	36	22	57	32	20	52	27	17	44	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	57	57	40	57	57	36	57	52	32	57	46	29	57	41	26	57	38	24	57	34	22	55	29	18	49	25	16	42	21	14	37	19	18	32	16	16	28	15	14
		27-45	80	80	80	78	78	78	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	57	52	31	57	45	28	57	40	25	57	36	23	57	33	20	57	30	19	51	27	17	43	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	57	55	34	57	48	30	57	42	27	57	38	24	57	34	22	57	31	20	55	29	18	48	24	15	41	21	13	35	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
20	B	0-7	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	39	29	39	39	24	39	33	21	39	29	18	39	25	16	39	22	14	37	20	12
		7-27	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	26	40	35	23	39	31	19	37	27	17	36	23	15	34	21	13
		27-45	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	62	62	59	59	59	54	54	54	50	50	50	45	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	39	39	37	39	39	33	39	39	30	39	39	27	39	39	24	39	36	22	39	32	20	39	27	17	39	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	14	33	19	18	31	16	16	28	15	14
		27-45	65	65	65	64	64	64	60	60	60	57	57	57	54	54	54	51	51	51	49	49	49	44	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	39	39	31	39	39	28	39	39	25	39	36	23	39	33	20	39	30	19	39	27	17	39	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	40	40	34	40	40	30	40	40	27	40	38	24	40	34	22	39	31	20	38	29	18	36	24	15	34	21	13	32	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	64	64	64	60	60	60	57	57	57	53	53	53	50	50	50	47	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
30	B	0-7	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	29	38	38	24	38	33	21	38	29	18	38	25	16	38	22	14	37	20	12
		7-27	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	26	40	35	23	39	31	19	37	27	17	36	23	15	34	21	13
		27-45	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	53	53	51	51	51	47	47	47	43	43	43	40	40	40	37	37	37	34	34	34	32	30	30
	C	0-7	38	38	37	38	38	33	38	38	30	38	38	27	38	38	24	38	36	22	38	32	20	38	27	17	38	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	14	33	19	18	31	16	16	28	15	14
		27-45	55	55	55	54	54	54	51	51	51	49	49	49	47	47	47	45	45	45	43	43	43	39	39	39	36	35	35	33	31	31	30	27	27	27	24	24	25	21	21
	D	0-7	39	39	31	39	39	28	39	39	25	39	36	23	39	33	20	39	30	19	39	27	17	39	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	40	40	34	40	40	30	40	40	27	40	38	24	40	34	22	39	31	20	38	29	18	36	24	15	34	21	13	32	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	55	55	55	52	52	52	49	49	49	47	47	47	44	44	44	42	42	42	40	40	40	36	35	35	33	30	30	30	26	26	26	22	22	23	20	20	21	17	17
40	B	0-7	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	24	32	32	21	32	29	18	32	25	16	32	22	14	32	20	12
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	26	34	34	23	33	31	19	32	27	17	31	23	15	30	21	13
		27-45	48	48	48	48	48	48	48	48	48	48	48	48	47	47	47	46	46	46	44	44	44	41	41	41	39	39	39	36	36	36	34	34	34	31	31	31	29	29	29
	C	0-7	32	32	32	32	32	32	32	32	30	32	32	27	32	32	24	32	32	22	32	32	20	32	27	17	32	23	15	32	20	13	32	18	17	29	15	15	26	14	13
		7-27	34	34	34	34	34	34	34	34	32	34	34	29	34	34	26	34	34	24	34	34	22	33	29	18	31	25	16	30	21	14	29	19	18	27	16	16	26	15	14
		27-45	48	48	48	46	46	46	45	45	45	43	43	43	41	41	41	40	40	40	38	38	38	35	35	35	32	32	32	30	30	30	28	27	27	25	24	24	24	21	21
	D	0-7	34	34	31	34	34	28	34	34	25	34	34	23	34	33	20	34	30	19	34	27	17	34	23	14	34	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	36	36	34	36	36	30	36	36	27	36	36	24	36	34	22	36	31	20	35	29	18	33	24	15	31	21	13	30	18	17	28	16	15	27	14	13	24	12	~~12~~
		27-45	48	48	48	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	36	36	36	33	33	33	30	30	30	28	26	26	25	22	22	23	20	20	21	17	17
50	B	0-7	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	26	21	26	26	18	26	25	16	26	22	14	26	20	12
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	23	28	28	19	28	27	17	27	23	15	26	21	13
		27-45	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	40	40	39	39	39	37	37	37	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27
	C	0-7	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	17	26	23	15	26	20	13	26	18	17	26	15	15	26	14	13
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	22	28	28	18	27	25	16	26	21	14	25	19	18	24	16	16	23	15	14
		27-45	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	34	34	34	32	32	32	30	30	30	27	27	27	25	25	25	24	24	24	22	21	21
	D	0-7	29	29	29	29	29	28	29	29	25	29	29	23	29	29	20	29	29	19	29	27	17	29	23	14	29	20	12	29	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	31	31	31	31	31	30	31	31	27	31	31	24	31	31	22	31	31	20	30	29	18	29	24	15	28	21	13	26	18	17	25	16	15	24	14	13	23	12	~~12~~
		27-45	43	43	43	41	41	41	39	39	39	38	38	38	36	36	36	35	35	35	33	33	33	31	31	31	28	28	28	26	26	26	24	22	22	22	20	20	20	17	17

* 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 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	22	22	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	16	22	22	14	22	20	12
		7-27	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	19	24	24	17	24	23	15	23	21	13
		27-45	38	38	38	38	38	38	38	38	38	38	38	38	37	37	37	36	36	36	35	35	35	33	33	33	32	32	32	30	30	30	28	28	28	27	27	27	25	25	25
	C	0-7	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	22	15	22	20	13	22	18	17	22	15	15	22	14	13
		7-27	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	18	24	24	16	23	21	14	22	19	18	21	16	16	21	15	14
		27-45	38	38	38	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	31	31	31	29	29	29	27	27	27	25	25	25	24	24	24	22	22	22	21	21	21
	D	0-7	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	23	14	24	20	12	24	17	16	24	15	14	24	13	12	21	17	~~11~~
		7-27	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	18	25	24	15	24	21	13	24	18	17	23	16	15	22	14	13	21	12	~~12~~
		27-45	38	38	38	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	31	31	31	28	28	28	26	26	26	24	24	24	22	22	22	21	20	20	19	17	17
70	B	0-7	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	19	19	14	19	19	12
		7-27	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	20	20	15	20	20	13
		27-45	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	34	34	34	33	33	33	32	32	32	30	30	30	29	29	29	27	27	27	26	26	26	25	25	25	23	23	23
	C	0-7	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	15	19	19	13	19	18	17	19	15	15	19	14	13
		7-27	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	16	20	20	14	20	19	18	19	16	16	19	15	14
		27-45	52*	52*	52*	33	33	33	32	32	32	31	31	31	30	30	30	30	30	30	29	29	29	27	27	27	25	25	25	24	24	24	22	22	22	21	21	21	20	20	20
	D	0-7	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	19	21	21	17	21	21	14	21	20	12	21	17	16	21	15	14	21	13	12	21	17	~~11~~
		7-27	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	23	15	22	21	13	21	18	17	20	16	15	20	14	13	19	12	~~12~~
		27-45	35	35	35	34	34	34	33	33	33	32	32	32	30	30	30	29	29	29	28	28	28	26	26	26	25	25	25	23	23	23	21	21	21	20	20	20	18	17	17
80	B	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12
		7-27	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	15	18	18	13
		27-45	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	46*	46*	46*	29	29	29	28	28	28	27	27	27	25	25	25	24	24	24	23	23	23	22	22	22
	C	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	16	17	16	15	15	16	14	13
		7-27	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	16	18	18	14	18	18	18	18	16	16	17	15	14
		27-45	44*	44*	44*	47*	47*	47*	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	24	24	24	22	22	22	21	21	21	20	20	20	18	18	18
	D	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	14	18	18	12	18	17	16	18	15	14	18	13	12	18	17	~~11~~
		7-27	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	20	13	19	18	17	19	16	15	18	14	13	17	12	~~12~~
		27-45	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	23	23	23	21	21	21	20	20	20	19	19	19	17	17	17
90	B	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12
		7-27	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13
		27-45	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	40*	40*	40*	42*	42*	42*	26	26	26	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21
	C	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	17	15	15	15	15	14	13
		7-27	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	18	16	16	16	16	15	14
		27-45	41*	41*	41*	40*	40*	40*	42*	42*	42*	27	27	27	26	26	26	25	25	25	25	25	25	23	23	23	22	22	22	21	21	21	20	20	20	19	19	19	18	18	18
	D	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12	16	16	16	16	15	14	16	13	12	16	17	~~11~~
		7-27	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15	18	18	13	18	18	17	17	16	15	17	14	13	16	12	~~12~~
		27-45	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	25	25	25	23	23	23	22	22	22	20	20	20	19	19	19	18	18	18	17	17	17
100	B	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12
		7-27	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13
		27-45	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	37*	37*	37*	36*	36*	36*	40	40	40	38	38	38	36	36	36	35	35	35	33	33	33	32	32	32
	C	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	17	13	13	15	13	13	13
		7-27	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	18	14	14	16	14	14	14
		27-45	35*	35*	35*	38*	38*	38*	36*	36*	36*	38*	38*	38*	40	40	40	39	39	39	38	38	38	36	36	36	34	34	34	32	32	32	30	30	30	28	28	28	27	27	27
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	16	15	15	14	15	13	12	15	17	~~11~~
		7-27	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	16	17	16	16	15	15	14	13	15	12	~~12~~
		27-45	43*	43*	43*	27	27	27	26	26	26	25	25	25	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21	19	19	19	18	18	18	17	17	17	16	16	16

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ASCE 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)

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			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	98	98	92	98	98	87	98	98	83	98	94	65	98	91	59	98	87	54	98	84	49	97	67	41	91	56	35	87	49	31	81	42	27	70	37	24	62	33	21
		7-27	99	99	90	99	99	86	99	99	82	99	95	71	99	91	63	99	88	58	99	85	53	99	72	44	95	60	38	90	51	33	86	45	29	79	40	25	69	35	23
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	98	93	63	98	89	56	98	85	50	98	78	45	96	66	41	93	60	37	90	55	34	85	46	29	75	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	99	94	68	99	90	60	99	86	54	99	82	49	99	71	44	97	63	40	94	58	37	88	49	31	83	42	27	71	36	23	62	32	20	54	28	27	48	25	24
		27-45	99	99	99	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	98	87	53	98	82	47	97	69	42	94	61	38	90	55	34	87	50	31	85	46	29	73	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	99	87	57	99	84	51	99	74	45	97	64	41	94	58	37	91	53	34	88	48	31	82	41	26	69	35	22	59	30	29	52	26	26	45	23	23	40	21	~~20~~
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
10	B	0-7	88	88	88	88	88	87	88	88	83	88	88	65	88	88	59	88	87	54	88	84	49	88	67	41	88	56	35	87	49	31	81	42	27	70	37	24	62	33	21
		7-27	88	88	88	88	88	86	88	88	82	88	88	71	88	88	63	88	88	58	88	85	53	88	72	44	88	60	38	88	51	33	86	45	29	79	40	25	69	35	23
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	88	88	63	88	88	56	88	85	50	88	78	45	88	66	41	88	60	37	88	55	34	85	46	29	75	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	88	88	68	88	88	60	88	86	54	88	82	49	88	71	44	88	63	40	88	58	37	88	49	31	83	42	27	71	36	23	62	32	20	54	28	27	48	25	24
		27-45	98	98	98	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	88	87	53	88	82	47	88	69	42	88	61	38	88	55	34	87	50	31	85	46	29	73	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	88	87	57	88	84	51	88	74	45	88	64	41	88	58	37	88	53	34	88	48	31	82	41	26	69	35	22	59	30	29	52	26	26	45	23	23	40	21	~~20~~
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
20	B	0-7	66	66	66	66	66	66	66	66	66	66	66	65	66	66	59	66	66	54	66	66	49	66	66	41	66	56	35	66	49	31	66	42	27	66	37	24	62	33	21
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	25	58	35	23
		27-45	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	91	91	89	89	89	87	87	87	84	84	84	76	75	75	70	64	64	63	56	56	57	50	50
	C	0-7	66	66	63	66	66	56	66	66	50	66	66	45	66	66	41	66	60	37	66	55	34	66	46	29	66	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	23	55	32	20	52	28	27	48	25	24
		27-45	92	92	92	91	91	91	90	90	90	88	88	88	87	87	87	85	85	85	82	82	82	74	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	22	54	30	29	51	26	26	45	23	23	40	21	~~20~~
		27-45	92	92	92	90	90	90	88	88	88	86	86	86	85	84	84	80	78	78	75	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
30	B	0-7	64	64	64	64	64	64	64	64	64	64	64	64	64	64	59	64	64	54	64	64	49	64	64	41	64	56	35	64	49	31	64	42	27	64	37	24	62	33	21
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	25	58	35	23
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	86	86	85	85	85	79	79	79	73	73	73	67	67	67	62	62	62	58	56	56	54	50	50
	C	0-7	64	64	63	64	64	56	64	64	50	64	64	45	64	64	41	64	60	37	64	55	34	64	46	29	64	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	23	55	32	20	52	28	27	48	25	24
		27-45	87	87	87	86	86	86	85	85	85	82	82	82	79	79	79	75	75	75	72	72	72	65	65	65	60	60	60	55	52	52	50	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	22	54	30	29	51	26	26	45	23	23	40	21	~~20~~
		27-45	87	87	87	86	86	86	83	83	83	79	79	79	75	75	75	71	71	71	67	67	67	61	58	58	55	50	50	50	43	43	44	38	38	39	33	33	35	30	30
40	B	0-7	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	53	35	53	49	31	53	42	27	53	37	24	53	33	21
		7-27	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	53	56	56	44	56	56	38	55	51	33	53	45	29	52	40	25	50	35	23
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	77	77	77	74	74	74	69	69	69	64	64	64	60	60	60	56	56	56	53	53	53	49	49	49
	C	0-7	53	53	53	53	53	53	53	53	50	53	53	45	53	53	41	53	53	37	53	53	34	53	46	29	53	39	25	53	34	21	53	30	28	49	26	25	43	23	22
		7-27	56	56	56	56	56	56	56	56	54	56	56	49	56	56	44	56	56	40	56	56	37	55	49	31	52	42	27	50	36	23	48	32	20	46	28	27	44	25	24
		27-45	80	80	80	78	78	78	75	75	75	72	72	72	69	69	69	66	66	66	64	64	64	59	59	59	54	54	54	50	50	50	46	45	45	43	40	40	40	35	35
	D	0-7	57	57	53	57	57	47	57	57	42	57	57	38	57	55	34	57	50	31	57	46	29	57	39	24	57	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	60	60	57	60	60	51	60	60	45	60	60	41	60	58	37	60	53	34	58	48	31	55	41	26	53	35	22	50	30	29	47	26	26	45	23	23	40	21	~~20~~
		27-45	80	80	80	77	77	77	73	73	73	70	70	70	67	67	67	64	64	64	61	61	61	56	56	56	51	50	50	46	43	43	43	38	38	39	33	33	35	30	30
50	B	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	35	43	43	31	43	42	27	43	37	24	43	33	21
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	38	47	47	33	46	45	29	45	40	25	43	35	23
		27-45	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	68	68	66	66	66	62	62	62	58	58	58	55	55	55	51	51	51	48	48	48	45	45	45
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	37	43	43	34	43	43	29	43	39	25	43	34	21	43	30	28	43	26	25	43	23	22
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	40	47	47	37	47	47	31	45	42	27	44	36	23	42	32	20	40	28	27	39	25	24
		27-45	70	70	70	69	69	69	66	66	66	64	64	64	62	62	62	59	59	59	57	57	57	53	53	53	50	50	50	46	46	46	43	43	43	40	40	40	37	35	35
	D	0-7	48	48	48	48	48	47	48	48	42	48	48	38	48	48	34	48	48	31	48	46	29	48	39	24	48	33	21	48	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	52	52	52	52	52	51	52	52	45	52	52	41	52	52	37	51	51	34	50	48	31	48	41	26	46	35	22	44	30	29	42	26	26	40	23	23	38	21	~~20~~
		27-45	71	71	71	69	69	69	66	66	66	63	63	63	60	60	60	58	58	58	56	56	56	51	51	51	47	47	47	43	43	43	40	38	38	37	33	33	34	30	30

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

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~~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 7-10	II	30 ft	Ss = 1.25	18.66 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	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	31	37	37	27	37	37	24	37	33	21
		7-27	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	40	29	39	39	25	38	35	23
		27-45	63	63	63	63	63	63	63	63	63	63	63	63	62	62	62	61	61	61	59	59	59	56	56	56	53	53	53	50	50	50	47	47	47	45	45	45	42	42	42
	C	0-7	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	29	37	37	25	37	34	21	37	30	28	37	26	25	37	23	22
		7-27	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	40	27	39	36	23	37	32	20	36	28	27	35	25	24
		27-45	63	63	63	61	61	61	60	60	60	58	58	58	56	56	56	54	54	54	52	52	52	49	49	49	46	46	46	43	43	43	40	40	40	37	37	37	35	35	35
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	29	40	39	24	40	33	21	40	29	27	40	25	24	40	22	21	36	30	~~19~~
		7-27	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	34	44	44	31	43	41	26	41	35	22	39	30	29	38	26	26	36	23	23	35	21	~~20~~
		27-45	64	64	64	62	62	62	60	60	60	58	58	58	55	55	55	53	53	53	51	51	51	47	47	47	44	44	44	41	41	41	38	38	38	35	33	33	32	30	30
70	B	0-7	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	31	32	32	27	32	32	24	32	32	21
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	29	34	34	25	34	34	23
		27-45	57	57	57	57	57	57	57	57	57	57	57	57	56	56	56	55	55	55	54	54	54	51	51	51	49	49	49	46	46	46	44	44	44	41	41	41	39	39	39
	C	0-7	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	32	21	32	30	28	32	26	25	32	23	22
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	27	34	34	23	34	32	20	33	28	27	31	25	24
		27-45	57	57	57	56	56	56	54	54	54	53	53	53	51	51	51	50	50	50	48	48	48	45	45	45	42	42	42	40	40	40	37	37	37	35	35	35	33	33	33
	D	0-7	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	35	29	35	35	24	35	33	21	35	29	27	35	25	24	35	22	21	35	30	~~19~~
		7-27	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	34	38	38	31	38	38	26	37	35	22	36	30	29	34	26	26	33	23	23	32	21	~~20~~
		27-45	59	59	59	57	57	57	55	55	55	53	53	53	51	51	51	49	49	49	48	48	48	44	44	44	41	41	41	38	38	38	36	36	36	33	33	33	31	30	30
80	B	0-7	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	24	28	28	21
		7-27	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	29	30	30	25	30	30	23
		27-45	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	50	50	49	49	49	47	47	47	45	45	45	43	43	43	41	41	41	39	39	39	37	37	37
	C	0-7	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	28	21	28	28	28	28	26	25	28	23	22
		7-27	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	30	20	30	28	27	29	25	24
		27-45	51	51	51	51	51	51	50	50	50	48	48	48	47	47	47	46	46	46	44	44	44	42	42	42	40	40	40	37	37	37	35	35	35	33	33	33	31	31	31
	D	0-7	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	24	31	31	21	31	29	27	31	25	24	31	22	21	31	30	~~19~~
		7-27	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	26	33	33	22	33	30	29	31	26	26	30	23	23	29	21	~~20~~
		27-45	54	54	54	52	52	52	51	51	51	49	49	49	47	47	47	46	46	46	44	44	44	41	41	41	39	39	39	36	36	36	34	34	34	32	32	32	29	29	29
90	B	0-7	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	25	25	25	25	25	25	25	25	25	24	25	25	21
		7-27	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	27	27	23
		27-45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	45	45	44	44	44	42	42	42	40	40	40	38	38	38	36	36	36	35	35	35
	C	0-7	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	25	25	25	21	25	25	28	25	25	25	25	23	22
		7-27	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	23	27	27	20	27	27	27	26	25	24
		27-45	46	46	46	46	46	46	46	46	46	45	45	45	43	43	43	42	42	42	41	41	41	39	39	39	37	37	37	35	35	35	33	33	33	31	31	31	30	30	30
	D	0-7	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	27	27	27	25	24	27	22	21	27	30	~~19~~
		7-27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	26	30	30	22	30	30	29	29	26	26	28	23	23	27	21	~~20~~
		27-45	50	50	50	48	48	48	47	47	47	46	46	46	44	44	44	43	43	43	42	42	42	39	39	39	37	37	37	34	34	34	32	32	32	30	30	30	28	28	28
100	B	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	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
		7-27	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
		27-45	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66	66	66	64	64	64	61	61	61	58	58	58	55	55	55	53	53	53
	C	0-7	22	22	22	22	22	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	22	22
		7-27	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	24	24	27	24	24	24
		27-45	69	69	69	69	69	69	69	69	69	68	68	68	66	66	66	65	65	65	63	63	63	60	60	60	56	56	56	53	53	53	50	50	50	48	48	48	45	45	45
	D	0-7	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	21	25	25	27	25	25	24	25	22	21	25	30	~~19~~
		7-27	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	29	27	26	26	26	23	23	25	21	~~20~~
		27-45	46	46	46	45	45	45	44	44	44	43	43	43	41	41	41	40	40	40	39	39	39	37	37	37	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27

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Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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0	B	0-7	67	67	50	67	67	42	67	66	36	67	57	32	67	50	29	67	45	27	67	40	24	64	33	20	54	28	17	46	24	15	40	21	13	35	18	18	31	16	16
		7-27	67	67	50	67	67	44	67	67	39	67	59	35	67	53	31	67	47	29	67	42	26	67	35	22	61	30	19	52	26	16	44	22	14	39	20	12	34	17	17
		27-45	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	64	64	60	60	60	52	51	51	45	43	43	40	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	67	55	31	67	47	28	67	41	25	67	36	22	64	33	20	58	30	19	52	27	17	43	23	14	37	19	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	67	57	34	67	50	30	67	44	27	67	39	24	67	34	22	65	31	20	59	29	18	49	24	15	41	21	13	35	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	69	69	69	67	67	67	61	61	61	56	56	56	52	51	51	48	46	46	44	41	41	38	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
	D	0-7	67	44	26	67	38	23	66	33	21	59	30	19	53	27	17	47	25	15	43	23	14	36	19	12	31	16	16	26	14	13	23	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	67	46	28	67	40	25	67	35	22	66	32	20	59	29	18	53	26	17	48	24	15	40	20	13	34	17	17	29	15	14	26	13	13	22	17	~~11~~	20	15	~~10~~
		27-45	63	63	63	58	58	58	53	52	52	48	47	47	44	42	42	41	38	38	38	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	15	15
10	B	0-7	47	47	47	47	47	42	47	47	36	47	47	32	47	47	29	47	45	27	47	40	24	47	33	20	47	28	17	46	24	15	40	21	13	35	18	18	31	16	16
		7-27	48	48	48	48	48	44	48	48	39	48	48	35	48	48	31	48	47	29	48	42	26	48	35	22	48	30	19	47	26	16	44	22	14	39	20	12	34	17	17
		27-45	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	63	63	60	60	60	52	51	51	45	43	43	40	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	47	47	31	47	47	28	47	41	25	47	36	22	47	33	20	47	30	19	47	27	17	43	23	14	37	19	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	48	48	34	48	48	30	48	44	27	48	39	24	48	34	22	48	31	20	48	29	18	46	24	15	41	21	13	35	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	67	67	67	65	65	65	61	61	61	56	56	56	52	51	51	48	46	46	44	41	41	38	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
	D	0-7	47	44	26	47	38	23	47	33	21	47	30	19	47	27	17	47	25	15	43	23	14	36	19	12	31	16	16	26	14	13	23	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	48	46	28	48	40	25	48	35	22	48	32	20	48	29	18	48	26	17	46	24	15	40	20	13	34	17	17	29	15	14	26	13	13	22	17	~~11~~	20	15	~~10~~
		27-45	63	63	63	58	58	58	53	52	52	48	47	47	44	42	42	41	38	38	38	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	15	15
20	B	0-7	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	27	33	33	24	33	33	20	33	28	17	33	24	15	33	21	13	33	18	18	31	16	16
		7-27	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	26	33	33	22	33	30	19	33	26	16	31	22	14	30	20	12	29	17	17
		27-45	55	55	55	55	55	55	55	55	55	55	55	55	54	54	54	52	52	52	50	50	50	45	45	45	41	41	41	38	37	37	35	32	32	31	28	28	28	25	25
	C	0-7	33	33	31	33	33	28	33	33	25	33	33	22	33	33	20	33	30	19	33	27	17	33	23	14	33	19	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	33	33	33	33	33	30	33	33	27	33	33	24	33	33	22	33	31	20	33	29	18	32	24	15	31	21	13	29	18	17	28	16	15	26	14	13	24	12	~~12~~
		27-45	55	55	55	53	53	53	50	50	50	48	48	48	45	45	45	43	43	43	41	41	41	37	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
	D	0-7	33	33	26	33	33	23	33	33	21	33	30	19	33	27	17	33	25	15	33	23	14	33	19	12	31	16	16	26	14	13	23	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	33	33	28	33	33	25	33	33	22	33	32	20	33	29	18	33	26	17	32	24	15	30	20	13	29	17	17	27	15	14	26	13	13	22	17	~~11~~	20	15	~~10~~
		27-45	53	53	53	50	50	50	47	47	47	45	45	45	42	42	42	40	38	38	37	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	15	15
30	B	0-7	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	27	32	32	24	32	32	20	32	28	17	32	24	15	32	21	13	32	18	18	31	16	16
		7-27	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	26	33	33	22	33	30	19	33	26	16	31	22	14	30	20	12	29	17	17
		27-45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	44	44	42	42	42	39	39	39	36	36	36	34	34	34	31	31	31	29	28	28	27	25	25
	C	0-7	32	32	31	32	32	28	32	32	25	32	32	22	32	32	20	32	30	19	32	27	17	32	23	14	32	19	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	33	33	33	33	33	30	33	33	27	33	33	24	33	33	22	33	31	20	33	29	18	32	24	15	31	21	13	29	18	17	28	16	15	26	14	13	24	12	~~12~~
		27-45	46	46	46	45	45	45	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	33	33	33	30	30	30	27	26	26	25	22	22	23	20	20	21	17	17
	D	0-7	33	33	26	33	33	23	33	33	21	33	30	19	33	27	17	33	25	15	33	23	14	33	19	12	31	16	16	26	14	13	23	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	33	33	28	33	33	25	33	33	22	33	32	20	33	29	18	33	26	17	32	24	15	30	20	13	29	17	17	27	15	14	26	13	13	22	17	~~11~~	20	15	~~10~~
		27-45	46	46	46	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	33	33	33	30	29	29	27	25	25	25	21	21	22	19	19	19	16	16	17	15	15
40	B	0-7	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	26	17	26	24	15	26	21	13	26	18	18	26	16	16
		7-27	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	28	19	28	26	16	27	22	14	26	20	12	25	17	17
		27-45	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	38	38	37	37	37	34	34	34	32	32	32	30	30	30	28	28	28	26	26	26	24	24	24
	C	0-7	26	26	26	26	26	26	26	26	25	26	26	22	26	26	20	26	26	19	26	26	17	26	23	14	26	19	12	26	17	16	26	15	14	24	13	12	21	17	~~11~~
		7-27	28	28	28	28	28	28	28	28	27	28	28	24	28	28	22	28	28	20	28	28	18	27	24	15	26	21	13	25	18	17	24	16	15	23	14	13	22	12	~~12~~
		27-45	40	40	40	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	29	29	29	27	27	27	25	25	25	23	22	22	21	20	20	20	17	17
	D	0-7	28	28	26	28	28	23	28	28	21	28	28	19	28	27	17	28	25	15	28	23	14	28	19	12	28	16	16	26	14	13	23	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	30	30	28	30	30	25	30	30	22	30	30	20	30	29	18	30	26	17	29	24	15	28	20	13	26	17	17	25	15	14	24	13	13	22	17	~~11~~	20	15	~~10~~
		27-45	40	40	40	38	38	38	37	37	37	35	35	35	33	33	33	32	32	32	30	30	30	28	28	28	25	25	25	23	21	21	21	19	19	19	16	16	17	15	15
50	B	0-7	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	22	15	22	21	13	22	18	18	22	16	16
		7-27	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	19	23	23	16	23	22	14	22	20	12	22	17	17
		27-45	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	34	34	33	33	33	31	31	31	29	29	29	27	27	27	26	26	26	24	24	24	23	23	23
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	19	22	22	17	22	22	14	22	19	12	22	17	16	22	15	14	22	13	12	21	17	~~11~~
		7-27	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	23	15	23	21	13	22	18	17	21	16	15	20	14	13	19	12	~~12~~
		27-45	35	35	35	34	34	34	33	33	33	32	32	32	31	31	31	30	30	30	29	29	29	27	27	27	25	25	25	23	23	23	21	21	21	20	20	20	18	17	17
	D	0-7	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	24	15	24	23	14	24	19	12	24	16	16	24	14	13	23	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	26	17	25	24	15	24	20	13	23	17	17	22	15	14	21	13	13	20	17	~~11~~	19	15	~~10~~
		27-45	36	36	36	34	34	34	33	33	33	31	31	31	30	30	30	29	29	29	28	28	28	25	25	25	23	23	23	22	21	21	20	19	19	18	16	16	17	15	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 7-10	II	30 ft	Ss = 1.25	22.78 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	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	15	18	18	13	18	18	18	18	16	16
		7-27	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	16	20	20	14	20	20	12	19	17	17
		27-45	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30	29	29	29	28	28	28	26	26	26	25	25	25	24	24	24	22	22	22	21	21	21
	C	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	14	18	18	12	18	17	16	18	15	14	18	13	12	18	17	~~11~~
		7-27	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	20	13	19	18	17	19	16	15	18	14	13	17	12	~~12~~
		27-45	31	31	31	31	31	31	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24	23	23	23	21	21	21	20	20	20	18	18	18	17	17	17
	D	0-7	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	15	20	20	14	20	19	12	20	16	16	20	14	13	20	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	22	17	22	22	15	21	20	13	20	17	17	20	15	14	19	13	13	18	17	~~11~~	17	15	~~10~~
		27-45	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24	22	22	22	20	20	20	19	19	19	17	16	16	16	15	15
70	B	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	16	18	16	16	16
		7-27	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	17	17	12	17	17	17
		27-45	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	27	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21	20	20	20
	C	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12	16	16	16	16	15	14	16	13	12	16	17	~~11~~
		7-27	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	17	17	16	15	16	14	13	16	12	~~12~~
		27-45	28	28	28	28	28	28	27	27	27	26	26	26	25	25	25	25	25	25	24	24	24	22	22	22	21	21	21	20	20	20	19	19	19	17	17	17	16	16	16
	D	0-7	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	14	17	17	12	17	16	16	17	14	13	17	12	~~12~~	17	16	~~10~~	17	15	~~9~~
		7-27	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	17	19	19	15	19	19	13	18	17	17	18	15	14	17	13	13	16	17	~~11~~	16	15	~~10~~
		27-45	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	25	25	25	24	24	24	22	22	22	20	20	20	19	19	19	18	18	18	16	16	16	15	15	15
80	B	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	18	14	14	16
		7-27	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	17
		27-45	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21	20	20	20	19	19	19	18	18	18
	C	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	16	14	14	14	14	13	12	14	17	~~11~~
		7-27	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	17	15	15	15	15	14	13	14	12	~~12~~
		27-45	37*	37*	37*	39*	39*	39*	25	25	25	24	24	24	23	23	23	23	23	23	22	22	22	21	21	21	20	20	20	18	18	18	17	17	17	16	16	16	15	15	15
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	16	15	14	13	15	12	~~12~~	15	16	~~10~~	15	15	~~9~~
		7-27	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	17	16	15	14	16	13	13	15	17	~~11~~	14	15	~~10~~
		27-45	27	27	27	26	26	26	25	25	25	24	24	24	24	24	24	23	23	23	22	22	22	21	21	21	19	19	19	18	18	18	17	17	17	16	16	16	15	15	15
90	B	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	16
		7-27	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	31	31	22	30	30	19	29	26	17
		27-45	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	51*	51*	51*	50*	50*	50*	52*	52*	52*	33	33	33	31	31	31	30	30	30	29	29	29	27	27	27	26	26	26
	C	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	16	12	12	14	12	12	12	12	17	~~11~~
		7-27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	28	31	31	23	31	31	20	30	27	17	29	24	15	28	21	13	27	18	~~12~~
		27-45	52*	52*	52*	50*	50*	50*	53*	53*	53*	33	33	33	33	33	33	32	32	32	31	31	31	29	29	29	28	28	28	26	26	26	25	25	25	23	23	23	22	22	22
	D	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	16	14	14	13	14	12	~~12~~	14	16	~~10~~	14	15	~~9~~
		7-27	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	17	15	15	14	14	13	13	14	17	~~11~~	13	15	~~10~~
		27-45	38*	38*	38*	39	39	39	38	38	38	37	37	37	36	36	36	35	35	35	34	34	34	31	31	31	29	29	29	27	27	27	25	25	25	24	24	24	22	22	22
100	B	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	17	11	11	16
		7-27	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	25	25	25	25	25	25	22	25	25	19	25	25	17
		27-45	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	47*	47*	47*	45*	45*	45*	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24
	C	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	16	11	11	14	11	11	12	11	17	~~11~~
		7-27	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	20	25	25	17	24	24	15	24	21	13	23	18	~~12~~
		27-45	44*	44*	44*	47*	47*	47*	46*	46*	46*	48*	48*	48*	30	30	30	30	30	30	29	29	29	27	27	27	26	26	26	25	25	25	23	23	23	22	22	22	21	21	21
	D	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	16	12	12	13	12	12	~~12~~	12	16	~~10~~	12	15	~~9~~
		7-27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	31	23	31	31	20	29	26	17	28	23	14	27	20	13	26	17	~~11~~	25	15	~~10~~
		27-45	54*	54*	54*	52*	52*	52*	33	33	33	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	26	26	26	24	24	24	23	23	23	22	22	22	20	20	20

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UNIRAC

ASCE 7-10	II	30 ft	Ss = 1.25	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	98	98	91	98	98	86	98	98	80	98	94	64	98	90	58	98	86	52	98	83	48	96	65	40	91	55	35	86	48	30	79	42	26	69	37	23	60	32	31
		7-27	98	98	89	98	98	85	98	98	79	98	94	69	98	90	62	98	87	56	98	84	52	98	69	43	94	58	37	89	50	32	85	44	28	77	39	25	67	34	33
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	98	92	62	98	88	55	98	84	49	98	75	44	96	64	40	92	59	37	89	53	34	84	45	28	73	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	98	93	67	98	89	59	98	85	53	98	79	48	98	69	43	96	62	39	93	56	36	87	48	31	82	41	26	70	35	34	60	31	30	53	27	26	47	24	23
		27-45	99	99	99	98	98	98	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	98	86	52	98	79	46	97	66	41	93	59	37	90	54	34	87	49	31	84	45	28	71	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	98	87	55	98	83	49	98	71	44	97	63	40	93	57	36	90	52	33	87	47	30	80	40	26	67	34	33	58	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	29	29
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		7-27	87	87	87	87	87	85	87	87	79	87	87	69	87	87	62	87	87	56	87	84	52	87	69	43	87	58	37	87	50	32	85	44	28	77	39	25	67	34	33
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	87	87	62	87	87	55	87	84	49	87	75	44	87	64	40	87	59	37	87	53	34	84	45	28	73	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	87	87	67	87	87	59	87	85	53	87	79	48	87	69	43	87	62	39	87	56	36	87	48	31	82	41	26	70	35	34	60	31	30	53	27	26	47	24	23
		27-45	98	98	98	97	97	97	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	87	86	52	87	79	46	87	66	41	87	59	37	87	54	34	87	49	31	84	45	28	71	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	87	87	55	87	83	49	87	71	44	87	63	40	87	57	36	87	52	33	87	47	30	80	40	26	67	34	33	58	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	29	29
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		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	28	59	39	25	56	34	33
		27-45	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	90	90	89	89	89	86	86	86	82	82	82	75	73	73	68	63	63	62	55	55	55	49	49
	C	0-7	64	64	62	64	64	55	64	64	49	64	64	44	64	64	40	64	59	37	64	53	34	64	45	28	64	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	26	57	35	34	54	31	30	51	27	26	47	24	23
		27-45	91	91	91	91	91	91	89	89	89	88	88	88	86	86	86	84	84	84	80	80	80	72	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	26	56	34	33	53	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	91	91	91	89	89	89	87	87	87	86	86	86	83	83	83	78	76	76	73	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	29	29
30	B	0-7	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	52	63	63	48	63	63	40	63	55	35	63	48	30	63	42	26	63	37	23	60	32	31
		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	28	59	39	25	56	34	33
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	83	83	83	77	77	77	71	71	71	66	66	66	61	61	61	56	55	55	52	49	49
	C	0-7	63	63	62	63	63	55	63	63	49	63	63	44	63	63	40	63	59	37	63	53	34	63	45	28	63	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	26	57	35	34	54	31	30	51	27	26	47	24	23
		27-45	86	86	86	86	86	86	84	84	84	80	80	80	77	77	77	73	73	73	70	70	70	64	64	64	58	58	58	53	50	50	49	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	26	56	34	33	53	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	86	86	86	85	85	85	81	81	81	77	77	77	73	73	73	69	69	69	65	65	65	59	57	57	54	49	49	49	42	42	43	37	37	38	33	33	34	29	29
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		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	43	55	55	37	54	50	32	52	44	28	50	39	25	49	34	33
		27-45	78	78	78	78	78	78	78	78	78	78	78	78	77	77	77	75	75	75	72	72	72	68	68	68	63	63	63	59	59	59	55	55	55	51	51	51	48	48	48
	C	0-7	52	52	52	52	52	52	52	52	49	52	52	44	52	52	40	52	52	37	52	52	34	52	45	28	52	39	24	52	33	32	52	29	28	48	26	24	42	23	22
		7-27	55	55	55	55	55	55	55	55	53	55	55	48	55	55	43	55	55	39	55	55	36	53	48	31	51	41	26	49	35	34	47	31	30	45	27	26	43	24	23
		27-45	78	78	78	76	76	76	73	73	73	70	70	70	67	67	67	65	65	65	62	62	62	57	57	57	53	53	53	49	49	49	45	44	44	42	39	39	39	34	34
	D	0-7	56	56	52	56	56	46	56	56	41	56	56	37	56	54	34	56	49	31	56	45	28	56	38	24	56	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	59	59	55	59	59	49	59	59	44	59	59	40	59	57	36	58	52	33	57	47	30	54	40	26	52	34	33	49	30	29	46	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	79	79	79	75	75	75	72	72	72	68	68	68	65	65	65	62	62	62	59	59	59	54	54	54	50	49	49	45	42	42	42	37	37	38	33	33	34	29	29
50	B	0-7	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	43	35	43	43	30	43	42	26	43	37	23	43	32	31
		7-27	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	37	46	46	32	45	44	28	44	39	25	42	34	33
		27-45	69	69	69	69	69	69	69	69	69	69	69	69	68	68	68	66	66	66	64	64	64	60	60	60	57	57	57	53	53	53	50	50	50	47	47	47	44	44	44
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	43	34	43	43	28	43	39	24	43	33	32	43	29	28	43	26	24	42	23	22
		7-27	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	39	46	46	36	46	46	31	44	41	26	43	35	34	41	31	30	39	27	26	38	24	23
		27-45	69	69	69	67	67	67	65	65	65	62	62	62	60	60	60	58	58	58	56	56	56	52	52	52	48	48	48	45	45	45	42	42	42	39	39	39	36	34	34
	D	0-7	47	47	47	47	47	46	47	47	41	47	47	37	47	47	34	47	47	31	47	45	28	47	38	24	47	32	31	47	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	51	51	51	51	51	49	51	51	44	51	51	40	51	51	36	50	50	33	49	47	30	47	40	26	45	34	33	43	30	29	41	26	25	39	34	~~22~~	37	31	~~20~~
		27-45	70	70	70	67	67	67	64	64	64	62	62	62	59	59	59	57	57	57	54	54	54	50	50	50	46	46	46	42	42	42	39	37	37	36	33	33	33	29	29

* 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 7-10	II	30 ft	Ss = 1.25	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	36	36	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	30	36	36	26	36	36	23	36	32	31
		7-27	39	39	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	39	28	39	39	25	38	34	33
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	58	58	58	55	55	55	52	52	52	49	49	49	46	46	46	44	44	44	41	41	41
	C	0-7	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	28	36	36	24	36	33	32	36	29	28	36	26	24	36	23	22
		7-27	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	31	39	39	26	38	35	34	36	31	30	35	27	26	34	24	23
		27-45	61	61	61	60	60	60	58	58	58	56	56	56	55	55	55	53	53	53	51	51	51	48	48	48	45	45	45	42	42	42	39	39	39	36	36	36	34	34	34
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	40	28	40	38	24	40	32	31	40	28	27	40	24	23	39	33	~~21~~	35	29	~~18~~
		7-27	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	43	33	43	43	30	42	40	26	40	34	33	39	30	29	37	26	25	35	34	~~22~~	34	31	~~20~~
		27-45	63	63	63	61	61	61	58	58	58	56	56	56	54	54	54	52	52	52	50	50	50	46	46	46	43	43	43	40	40	40	37	37	37	34	33	33	32	29	29
70	B	0-7	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	30	31	31	26	31	31	23	31	31	31
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	28	34	34	25	34	34	33
		27-45	56	56	56	56	56	56	56	56	56	56	56	56	55	55	55	54	54	54	52	52	52	50	50	50	47	47	47	45	45	45	43	43	43	41	41	41	38	38	38
	C	0-7	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	31	32	31	29	28	31	26	24	31	23	22
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	26	34	34	34	33	31	30	32	27	26	31	24	23
		27-45	56	56	56	54	54	54	53	53	53	51	51	51	50	50	50	48	48	48	47	47	47	44	44	44	41	41	41	39	39	39	37	37	37	34	34	34	32	32	32
	D	0-7	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	24	34	32	31	34	28	27	34	24	23	34	33	~~21~~	34	29	~~18~~
		7-27	37	37	37	37	37	37	37	37	37	37	37	37	37	37	36	37	37	33	37	37	30	37	37	26	36	34	33	35	30	29	34	26	25	32	34	~~22~~	31	31	~~20~~
		27-45	57	57	57	55	55	55	53	53	53	52	52	52	50	50	50	48	48	48	46	46	46	43	43	43	40	40	40	37	37	37	35	35	35	32	32	32	30	29	29
80	B	0-7	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	27	27	31
		7-27	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	28	30	30	25	30	30	33
		27-45	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	49	49	48	48	48	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	36	36	36
	C	0-7	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	32	27	27	28	27	26	24	27	23	22
		7-27	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	26	30	30	34	30	30	30	29	27	26	28	24	23
		27-45	50	50	50	50	50	50	48	48	48	47	47	47	46	46	46	45	45	45	43	43	43	41	41	41	39	39	39	36	36	36	34	34	34	32	32	32	30	30	30
	D	0-7	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	24	30	30	31	30	28	27	30	24	23	30	33	~~21~~	30	29	~~18~~
		7-27	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	26	33	33	33	32	30	29	31	26	25	30	34	~~22~~	29	31	~~20~~
		27-45	53	53	53	51	51	51	49	49	49	48	48	48	46	46	46	45	45	45	43	43	43	41	41	41	38	38	38	35	35	35	33	33	33	31	31	31	29	29	29
90	B	0-7	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	31
		7-27	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	56	60	60	49	60	60	43	59	58	38	58	52	33
		27-45	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	67	67	64	64	64	61	61	61	58	58	58	56	56	56	53	53	53	51	51	51
	C	0-7	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	32	24	24	28	24	24	24	24	23	22
		7-27	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	54	60	60	46	60	60	40	58	53	34	56	47	30	54	41	26	52	36	23
		27-45	68	68	68	68	68	68	67	67	67	65	65	65	64	64	64	62	62	62	61	61	61	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	43	43	43
	D	0-7	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	27	27	27	24	23	27	33	~~21~~	27	29	~~18~~
		7-27	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	29	33	29	29	29	28	26	25	27	34	~~22~~	27	31	~~20~~
		27-45	75	75	75	75	75	75	75	75	75	73	73	73	70	70	70	68	68	68	66	66	66	61	61	61	57	57	57	53	53	53	50	50	50	47	47	47	44	44	44
100	B	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	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
		7-27	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	48	38	48	48	33
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	57	57	57	55	55	55	53	53	53	50	50	50	48	48	48
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	32	22	22	28	22	22	24	22	22	22
		7-27	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	48	34	48	47	30	47	41	26	45	36	23
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	58	58	58	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	44	44	44	41	41	41
	D	0-7	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	27	24	24	23	24	33	~~21~~	24	29	~~18~~
		7-27	60	60	60	60	60	60	60	60	60	60	60	60	60	60	55	60	60	50	60	60	46	60	60	39	58	52	33	55	45	29	53	39	25	51	34	~~22~~	49	31	~~20~~
		27-45	68	68	68	66	66	66	64	64	64	62	62	62	61	61	61	59	59	59	57	57	57	54	54	54	51	51	51	48	48	48	45	45	45	42	42	42	40	40	40

* 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 7-10	II	30 ft	Ss = 3.00	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	80	80	60	80	80	50	80	79	43	80	69	39	80	60	35	80	53	32	80	48	29	77	39	24	65	33	21	55	29	18	48	25	16	41	22	14	37	20	12
		7-27	80	80	60	80	80	53	80	80	47	80	71	42	80	63	38	80	56	34	80	50	31	80	41	26	73	35	23	62	31	19	53	27	17	46	23	15	41	21	13
		27-45	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	77	77	77	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	80	66	37	80	57	33	80	49	30	80	43	27	77	39	24	69	36	22	63	32	20	52	27	17	44	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	80	68	40	80	59	36	80	52	32	80	46	29	80	41	26	77	38	24	70	34	22	58	29	18	49	25	16	42	21	14	37	19	18	32	16	16	28	15	14
		27-45	83	83	83	80	80	80	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	80	52	31	80	45	28	79	40	25	70	36	23	63	33	20	57	30	19	51	27	17	43	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	80	55	34	80	48	30	80	42	27	79	38	24	71	34	22	64	31	20	58	29	18	48	24	15	41	21	13	35	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
10	B	0-7	57	57	57	57	57	50	57	57	43	57	57	39	57	57	35	57	53	32	57	48	29	57	39	24	57	33	21	55	29	18	48	25	16	41	22	14	37	20	12
		7-27	57	57	57	57	57	53	57	57	47	57	57	42	57	57	38	57	56	34	57	50	31	57	41	26	57	35	23	57	31	19	53	27	17	46	23	15	41	21	13
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	76	76	71	71	71	62	61	61	54	51	51	48	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	57	57	37	57	57	33	57	49	30	57	43	27	57	39	24	57	36	22	57	32	20	52	27	17	44	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	57	57	40	57	57	36	57	52	32	57	46	29	57	41	26	57	38	24	57	34	22	55	29	18	49	25	16	42	21	14	37	19	18	32	16	16	28	15	14
		27-45	80	80	80	78	78	78	73	73	73	67	67	67	62	61	61	57	55	55	53	50	50	45	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	57	52	31	57	45	28	57	40	25	57	36	23	57	33	20	57	30	19	51	27	17	43	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	57	55	34	57	48	30	57	42	27	57	38	24	57	34	22	57	31	20	55	29	18	48	24	15	41	21	13	35	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	76	76	76	69	69	69	63	62	62	58	56	56	53	50	50	49	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
20	B	0-7	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	39	29	39	39	24	39	33	21	39	29	18	39	25	16	39	22	14	37	20	12
		7-27	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	26	40	35	23	39	31	19	37	27	17	36	23	15	34	21	13
		27-45	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	62	62	59	59	59	54	54	54	50	50	50	45	44	44	42	38	38	38	34	34	34	30	30
	C	0-7	39	39	37	39	39	33	39	39	30	39	39	27	39	39	24	39	36	22	39	32	20	39	27	17	39	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	14	33	19	18	31	16	16	28	15	14
		27-45	65	65	65	64	64	64	60	60	60	57	57	57	54	54	54	51	51	51	49	49	49	44	41	41	39	35	35	35	31	31	31	27	27	27	24	24	25	21	21
	D	0-7	39	39	31	39	39	28	39	39	25	39	36	23	39	33	20	39	30	19	39	27	17	39	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	40	40	34	40	40	30	40	40	27	40	38	24	40	34	22	39	31	20	38	29	18	36	24	15	34	21	13	32	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	64	64	64	60	60	60	57	57	57	53	53	53	50	50	50	47	45	45	45	41	41	39	35	35	34	30	30	30	26	26	26	22	22	23	20	20	21	17	17
30	B	0-7	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	29	38	38	24	38	33	21	38	29	18	38	25	16	38	22	14	37	20	12
		7-27	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	26	40	35	23	39	31	19	37	27	17	36	23	15	34	21	13
		27-45	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	53	53	51	51	51	47	47	47	43	43	43	40	40	40	37	37	37	34	34	34	32	30	30
	C	0-7	38	38	37	38	38	33	38	38	30	38	38	27	38	38	24	38	36	22	38	32	20	38	27	17	38	23	15	38	20	13	33	18	17	29	15	15	26	14	13
		7-27	40	40	40	40	40	36	40	40	32	40	40	29	40	40	26	40	38	24	40	34	22	38	29	18	37	25	16	35	21	14	33	19	18	31	16	16	28	15	14
		27-45	55	55	55	54	54	54	51	51	51	49	49	49	47	47	47	45	45	45	43	43	43	39	39	39	36	35	35	33	31	31	30	27	27	27	24	24	25	21	21
	D	0-7	39	39	31	39	39	28	39	39	25	39	36	23	39	33	20	39	30	19	39	27	17	39	23	14	37	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	40	40	34	40	40	30	40	40	27	40	38	24	40	34	22	39	31	20	38	29	18	36	24	15	34	21	13	32	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	55	55	55	52	52	52	49	49	49	47	47	47	44	44	44	42	42	42	40	40	40	36	35	35	33	30	30	30	26	26	26	22	22	23	20	20	21	17	17
40	B	0-7	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	24	32	32	21	32	29	18	32	25	16	32	22	14	32	20	12
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	26	34	34	23	33	31	19	32	27	17	31	23	15	30	21	13
		27-45	48	48	48	48	48	48	48	48	48	48	48	48	47	47	47	46	46	46	44	44	44	41	41	41	39	39	39	36	36	36	34	34	34	31	31	31	29	29	29
	C	0-7	32	32	32	32	32	32	32	32	30	32	32	27	32	32	24	32	32	22	32	32	20	32	27	17	32	23	15	32	20	13	32	18	17	29	15	15	26	14	13
		7-27	34	34	34	34	34	34	34	34	32	34	34	29	34	34	26	34	34	24	34	34	22	33	29	18	31	25	16	30	21	14	29	19	18	27	16	16	26	15	14
		27-45	48	48	48	46	46	46	45	45	45	43	43	43	41	41	41	40	40	40	38	38	38	35	35	35	32	32	32	30	30	30	28	27	27	25	24	24	24	21	21
	D	0-7	34	34	31	34	34	28	34	34	25	34	34	23	34	33	20	34	30	19	34	27	17	34	23	14	34	20	12	32	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	36	36	34	36	36	30	36	36	27	36	36	24	36	34	22	36	31	20	35	29	18	33	24	15	31	21	13	30	18	17	28	16	15	27	14	13	24	12	~~12~~
		27-45	48	48	48	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	36	36	36	33	33	33	30	30	30	28	26	26	25	22	22	23	20	20	21	17	17
50	B	0-7	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	26	21	26	26	18	26	25	16	26	22	14	26	20	12
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	23	28	28	19	28	27	17	27	23	15	26	21	13
		27-45	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	40	40	39	39	39	37	37	37	35	35	35	33	33	33	31	31	31	29	29	29	27	27	27
	C	0-7	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	17	26	23	15	26	20	13	26	18	17	26	15	15	26	14	13
		7-27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	22	28	28	18	27	25	16	26	21	14	25	19	18	24	16	16	23	15	14
		27-45	42	42	42	41	41	41	40	40	40	38	38	38	37	37	37	36	36	36	34	34	34	32	32	32	30	30	30	27	27	27	25	25	25	24	24	24	22	21	21
	D	0-7	29	29	29	29	29	28	29	29	25	29	29	23	29	29	20	29	29	19	29	27	17	29	23	14	29	20	12	29	17	16	27	15	14	24	13	12	21	17	~~11~~
		7-27	31	31	31	31	31	30	31	31	27	31	31	24	31	31	22	31	31	20	30	29	18	29	24	15	28	21	13	26	18	17	25	16	15	24	14	13	23	12	~~12~~
		27-45	43	43	43	41	41	41	39	39	39	38	38	38	36	36	36	35	35	35	33	33	33	31	31	31	28	28	28	26	26	26	24	22	22	22	20	20	20	17	17

* 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 7-10	II	30 ft	Ss = 3.00	18.66 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	22	22	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	16	22	22	14	22	20	12
		7-27	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	19	24	24	17	24	23	15	23	21	13
		27-45	38	38	38	38	38	38	38	38	38	38	38	38	37	37	37	36	36	36	35	35	35	33	33	33	32	32	32	30	30	30	28	28	28	27	27	27	25	25	25
	C	0-7	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	22	15	22	20	13	22	18	17	22	15	15	22	14	13
		7-27	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	18	24	24	16	23	21	14	22	19	18	21	16	16	21	15	14
		27-45	38	38	38	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	31	31	31	29	29	29	27	27	27	25	25	25	24	24	24	22	22	22	21	21	21
	D	0-7	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	23	14	24	20	12	24	17	16	24	15	14	24	13	12	21	17	~~11~~
		7-27	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	18	25	24	15	24	21	13	24	18	17	23	16	15	22	14	13	21	12	~~12~~
		27-45	38	38	38	37	37	37	36	36	36	34	34	34	33	33	33	32	32	32	31	31	31	28	28	28	26	26	26	24	24	24	22	22	22	21	20	20	19	17	17
70	B	0-7	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	19	19	14	19	19	12
		7-27	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	20	20	15	20	20	13
		27-45	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	34	34	34	33	33	33	32	32	32	30	30	30	29	29	29	27	27	27	26	26	26	25	25	25	23	23	23
	C	0-7	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	15	19	19	13	19	18	17	19	15	15	19	14	13
		7-27	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	16	20	20	14	20	19	18	19	16	16	19	15	14
		27-45	52*	52*	52*	33	33	33	32	32	32	31	31	31	30	30	30	30	30	30	29	29	29	27	27	27	25	25	25	24	24	24	22	22	22	21	21	21	20	20	20
	D	0-7	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	19	21	21	17	21	21	14	21	20	12	21	17	16	21	15	14	21	13	12	21	17	~~11~~
		7-27	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	23	15	22	21	13	21	18	17	20	16	15	20	14	13	19	12	~~12~~
		27-45	35	35	35	34	34	34	33	33	33	32	32	32	30	30	30	29	29	29	28	28	28	26	26	26	25	25	25	23	23	23	21	21	21	20	20	20	18	17	17
80	B	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12
		7-27	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	15	18	18	13
		27-45	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	46*	46*	46*	29	29	29	28	28	28	27	27	27	25	25	25	24	24	24	23	23	23	22	22	22
	C	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	16	17	16	15	15	16	14	13
		7-27	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	16	18	18	14	18	18	18	18	16	16	17	15	14
		27-45	44*	44*	44*	47*	47*	47*	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	24	24	24	22	22	22	21	21	21	20	20	20	18	18	18
	D	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	14	18	18	12	18	17	16	18	15	14	18	13	12	18	17	~~11~~
		7-27	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	20	13	19	18	17	19	16	15	18	14	13	17	12	~~12~~
		27-45	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	23	23	23	21	21	21	20	20	20	19	19	19	17	17	17
90	B	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12
		7-27	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13
		27-45	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	41*	40*	40*	40*	42*	42*	42*	26	26	26	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21
	C	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	17	15	15	15	15	14	13
		7-27	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	18	16	16	16	16	15	14
		27-45	41*	41*	41*	40*	40*	40*	42*	42*	42*	27	27	27	26	26	26	25	25	25	25	25	25	23	23	23	22	22	22	21	21	21	20	20	20	19	19	19	18	18	18
	D	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12	16	16	16	16	15	14	16	13	12	16	17	~~11~~
		7-27	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15	18	18	13	18	18	17	17	16	15	17	14	13	16	12	~~12~~
		27-45	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	25	25	25	23	23	23	22	22	22	20	20	20	19	19	19	18	18	18	17	17	17
100	B	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12
		7-27	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13
		27-45	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	35*	37*	37*	37*	36*	36*	36*	40	40	40	38	38	38	36	36	36	35	35	35	33	33	33	32	32	32
	C	0-7	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	17	13	13	15	13	13	13
		7-27	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	18	14	14	16	14	14	14
		27-45	35*	35*	35*	38*	38*	38*	36*	36*	36*	38*	38*	38*	40	40	40	39	39	39	38	38	38	36	36	36	34	34	34	32	32	32	30	30	30	28	28	28	27	27	27
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	16	15	15	14	15	13	12	15	17	~~11~~
		7-27	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	16	17	16	16	15	15	14	13	15	12	~~12~~
		27-45	43*	43*	43*	27	27	27	26	26	26	25	25	25	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21	19	19	19	18	18	18	17	17	17	16	16	16

* 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 7-10	II	30 ft	Ss = 3.00	18.66 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	98	98	92	98	98	87	98	98	83	98	94	65	98	91	59	98	87	54	98	84	49	97	67	41	91	56	35	87	49	31	81	42	27	70	37	24	62	33	21
		7-27	99	99	90	99	99	86	99	99	82	99	95	71	99	91	63	99	88	58	99	85	53	99	72	44	95	60	38	90	51	33	86	45	29	79	40	25	69	35	23
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	98	93	63	98	89	56	98	85	50	98	78	45	96	66	41	93	60	37	90	55	34	85	46	29	75	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	99	94	68	99	90	60	99	86	54	99	82	49	99	71	44	97	63	40	94	58	37	88	49	31	83	42	27	71	36	23	62	32	20	54	28	27	48	25	24
		27-45	99	99	99	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	98	87	53	98	82	47	97	69	42	94	61	38	90	55	34	87	50	31	85	46	29	73	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	99	87	57	99	84	51	99	74	45	97	64	41	94	58	37	91	53	34	88	48	31	82	41	26	69	35	22	59	30	29	52	26	26	45	23	23	40	21	~~20~~
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
10	B	0-7	88	88	88	88	88	87	88	88	83	88	88	65	88	88	59	88	87	54	88	84	49	88	67	41	88	56	35	87	49	31	81	42	27	70	37	24	62	33	21
		7-27	88	88	88	88	88	86	88	88	82	88	88	71	88	88	63	88	88	58	88	85	53	88	72	44	88	60	38	88	51	33	86	45	29	79	40	25	69	35	23
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	97	97	95	95	95	91	90	90	87	85	85	80	75	75	71	64	64	63	56	56	57	50	50
	C	0-7	88	88	63	88	88	56	88	85	50	88	78	45	88	66	41	88	60	37	88	55	34	85	46	29	75	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	88	88	68	88	88	60	88	86	54	88	82	49	88	71	44	88	63	40	88	58	37	88	49	31	83	42	27	71	36	23	62	32	20	54	28	27	48	25	24
		27-45	98	98	98	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	76	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	88	87	53	88	82	47	88	69	42	88	61	38	88	55	34	87	50	31	85	46	29	73	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	88	87	57	88	84	51	88	74	45	88	64	41	88	58	37	88	53	34	88	48	31	82	41	26	69	35	22	59	30	29	52	26	26	45	23	23	40	21	~~20~~
		27-45	97	97	97	94	94	94	91	90	90	89	87	87	86	84	84	82	78	78	76	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
20	B	0-7	66	66	66	66	66	66	66	66	66	66	66	65	66	66	59	66	66	54	66	66	49	66	66	41	66	56	35	66	49	31	66	42	27	66	37	24	62	33	21
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	25	58	35	23
		27-45	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	91	91	89	89	89	87	87	87	84	84	84	76	75	75	70	64	64	63	56	56	57	50	50
	C	0-7	66	66	63	66	66	56	66	66	50	66	66	45	66	66	41	66	60	37	66	55	34	66	46	29	66	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	23	55	32	20	52	28	27	48	25	24
		27-45	92	92	92	91	91	91	90	90	90	88	88	88	87	87	87	85	85	85	82	82	82	74	70	70	66	60	60	58	52	52	52	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	22	54	30	29	51	26	26	45	23	23	40	21	~~20~~
		27-45	92	92	92	90	90	90	88	88	88	86	86	86	85	84	84	80	78	78	75	70	70	65	58	58	57	50	50	50	43	43	44	38	38	39	33	33	35	30	30
30	B	0-7	64	64	64	64	64	64	64	64	64	64	64	64	64	64	59	64	64	54	64	64	49	64	64	41	64	56	35	64	49	31	64	42	27	64	37	24	62	33	21
		7-27	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	58	67	67	53	67	67	44	67	60	38	65	51	33	63	45	29	60	40	25	58	35	23
		27-45	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	86	86	86	85	85	85	79	79	79	73	73	73	67	67	67	62	62	62	58	56	56	54	50	50
	C	0-7	64	64	63	64	64	56	64	64	50	64	64	45	64	64	41	64	60	37	64	55	34	64	46	29	64	39	25	64	34	21	55	30	28	49	26	25	43	23	22
		7-27	67	67	67	67	67	60	67	67	54	67	67	49	67	67	44	67	63	40	67	58	37	64	49	31	61	42	27	58	36	23	55	32	20	52	28	27	48	25	24
		27-45	87	87	87	86	86	86	85	85	85	82	82	82	79	79	79	75	75	75	72	72	72	65	65	65	60	60	60	55	52	52	50	45	45	46	40	40	41	35	35
	D	0-7	66	66	53	66	66	47	66	66	42	66	61	38	66	55	34	66	50	31	66	46	29	66	39	24	62	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	67	67	57	67	67	51	67	67	45	67	64	41	67	58	37	66	53	34	64	48	31	61	41	26	57	35	22	54	30	29	51	26	26	45	23	23	40	21	~~20~~
		27-45	87	87	87	86	86	86	83	83	83	79	79	79	75	75	75	71	71	71	67	67	67	61	58	58	55	50	50	50	43	43	44	38	38	39	33	33	35	30	30
40	B	0-7	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	53	35	53	49	31	53	42	27	53	37	24	53	33	21
		7-27	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	53	56	56	44	56	56	38	55	51	33	53	45	29	52	40	25	50	35	23
		27-45	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	77	77	77	74	74	74	69	69	69	64	64	64	60	60	60	56	56	56	53	53	53	49	49	49
	C	0-7	53	53	53	53	53	53	53	53	50	53	53	45	53	53	41	53	53	37	53	53	34	53	46	29	53	39	25	53	34	21	53	30	28	49	26	25	43	23	22
		7-27	56	56	56	56	56	56	56	56	54	56	56	49	56	56	44	56	56	40	56	56	37	55	49	31	52	42	27	50	36	23	48	32	20	46	28	27	44	25	24
		27-45	80	80	80	78	78	78	75	75	75	72	72	72	69	69	69	66	66	66	64	64	64	59	59	59	54	54	54	50	50	50	46	45	45	43	40	40	40	35	35
	D	0-7	57	57	53	57	57	47	57	57	42	57	57	38	57	55	34	57	50	31	57	46	29	57	39	24	57	33	21	53	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	60	60	57	60	60	51	60	60	45	60	60	41	60	58	37	60	53	34	58	48	31	55	41	26	53	35	22	50	30	29	47	26	26	45	23	23	40	21	~~20~~
		27-45	80	80	80	77	77	77	73	73	73	70	70	70	67	67	67	64	64	64	61	61	61	56	56	56	51	50	50	46	43	43	43	38	38	39	33	33	35	30	30
50	B	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	35	43	43	31	43	42	27	43	37	24	43	33	21
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	38	47	47	33	46	45	29	45	40	25	43	35	23
		27-45	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	68	68	66	66	66	62	62	62	58	58	58	55	55	55	51	51	51	48	48	48	45	45	45
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	37	43	43	34	43	43	29	43	39	25	43	34	21	43	30	28	43	26	25	43	23	22
		7-27	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	40	47	47	37	47	47	31	45	42	27	44	36	23	42	32	20	40	28	27	39	25	24
		27-45	70	70	70	69	69	69	66	66	66	64	64	64	62	62	62	59	59	59	57	57	57	53	53	53	50	50	50	46	46	46	43	43	43	40	40	40	37	35	35
	D	0-7	48	48	48	48	48	47	48	48	42	48	48	38	48	48	34	48	48	31	48	46	29	48	39	24	48	33	21	48	29	27	46	25	24	41	22	21	36	30	~~19~~
		7-27	52	52	52	52	52	51	52	52	45	52	52	41	52	52	37	51	51	34	50	48	31	48	41	26	46	35	22	44	30	29	42	26	26	40	23	23	38	21	~~20~~
		27-45	71	71	71	69	69	69	66	66	66	63	63	63	60	60	60	58	58	58	56	56	56	51	51	51	47	47	47	43	43	43	40	38	38	37	33	33	34	30	30

* 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 7-10	II	30 ft	Ss = 3.00	18.66 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	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	31	37	37	27	37	37	24	37	33	21
		7-27	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	40	29	39	39	25	38	35	23
		27-45	63	63	63	63	63	63	63	63	63	63	63	63	62	62	62	61	61	61	59	59	59	56	56	56	53	53	53	50	50	50	47	47	47	45	45	45	42	42	42
	C	0-7	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	29	37	37	25	37	34	21	37	30	28	37	26	25	37	23	22
		7-27	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	40	27	39	36	23	37	32	20	36	28	27	35	25	24
		27-45	63	63	63	61	61	61	60	60	60	58	58	58	56	56	56	54	54	54	52	52	52	49	49	49	46	46	46	43	43	43	40	40	40	37	37	37	35	35	35
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	29	40	39	24	40	33	21	40	29	27	40	25	24	40	22	21	36	30	~~19~~
		7-27	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	34	44	44	31	43	41	26	41	35	22	39	30	29	38	26	26	36	23	23	35	21	~~20~~
		27-45	64	64	64	62	62	62	60	60	60	58	58	58	55	55	55	53	53	53	51	51	51	47	47	47	44	44	44	41	41	41	38	38	38	35	33	33	32	30	30
70	B	0-7	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	31	32	32	27	32	32	24	32	32	21
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		27-45	69	69	69	69	69	69	69	69	69	68	68	68	66	66	66	65	65	65	63	63	63	60	60	60	56	56	56	53	53	53	50	50	50	48	48	48	45	45	45
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* 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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	67	67	50	67	67	42	67	66	36	67	57	32	67	50	29	67	45	27	67	40	24	64	33	20	54	28	17	46	24	15	40	21	13	35	18	18	31	16	16
		7-27	67	67	50	67	67	44	67	67	39	67	59	35	67	53	31	67	47	29	67	42	26	67	35	22	61	30	19	52	26	16	44	22	14	39	20	12	34	17	17
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		7-27	67	57	34	67	50	30	67	44	27	67	39	24	67	34	22	65	31	20	59	29	18	49	24	15	41	21	13	35	18	17	31	16	15	27	14	13	24	12	~~12~~
		27-45	69	69	69	67	67	67	61	61	61	56	56	56	52	51	51	48	46	46	44	41	41	38	35	35	33	30	30	29	26	26	26	22	22	23	20	20	21	17	17
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		7-27	67	46	28	67	40	25	67	35	22	66	32	20	59	29	18	53	26	17	48	24	15	40	20	13	34	17	17	29	15	14	26	13	13	22	17	~~11~~	20	15	~~10~~
		27-45	63	63	63	58	58	58	53	52	52	48	47	47	44	42	42	41	38	38	38	34	34	32	29	29	28	25	25	25	21	21	22	19	19	19	16	16	17	15	15
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		7-27	48	48	48	48	48	44	48	48	39	48	48	35	48	48	31	48	47	29	48	42	26	48	35	22	48	30	19	47	26	16	44	22	14	39	20	12	34	17	17
		27-45	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	63	63	60	60	60	52	51	51	45	43	43	40	37	37	35	32	32	31	28	28	28	25	25
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	D	0-7	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	24	15	24	23	14	24	19	12	24	16	16	24	14	13	23	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	26	17	25	24	15	24	20	13	23	17	17	22	15	14	21	13	13	20	17	~~11~~	19	15	~~10~~
		27-45	36	36	36	34	34	34	33	33	33	31	31	31	30	30	30	29	29	29	28	28	28	25	25	25	23	23	23	22	21	21	20	19	19	18	16	16	17	15	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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	PORTRAIT	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	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	15	18	18	13	18	18	18	18	16	16
		7-27	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	16	20	20	14	20	20	12	19	17	17
		27-45	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30	29	29	29	28	28	28	26	26	26	25	25	25	24	24	24	22	22	22	21	21	21
	C	0-7	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	14	18	18	12	18	17	16	18	15	14	18	13	12	18	17	~~11~~
		7-27	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	20	13	19	18	17	19	16	15	18	14	13	17	12	~~12~~
		27-45	31	31	31	31	31	31	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24	23	23	23	21	21	21	20	20	20	18	18	18	17	17	17
	D	0-7	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	15	20	20	14	20	19	12	20	16	16	20	14	13	20	12	~~12~~	20	16	~~10~~	18	15	~~9~~
		7-27	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	22	17	22	22	15	21	20	13	20	17	17	20	15	14	19	13	13	18	17	~~11~~	17	15	~~10~~
		27-45	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24	22	22	22	20	20	20	19	19	19	17	16	16	16	15	15
70	B	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	16	18	16	16	16
		7-27	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	17	17	12	17	17	17
		27-45	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	27	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21	20	20	20
	C	0-7	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12	16	16	16	16	15	14	16	13	12	16	17	~~11~~
		7-27	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	17	17	16	15	16	14	13	16	12	~~12~~
		27-45	28	28	28	28	28	28	27	27	27	26	26	26	25	25	25	25	25	25	24	24	24	22	22	22	21	21	21	20	20	20	19	19	19	17	17	17	16	16	16
	D	0-7	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	14	17	17	12	17	16	16	17	14	13	17	12	~~12~~	17	16	~~10~~	17	15	~~9~~
		7-27	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	17	19	19	15	19	19	13	18	17	17	18	15	14	17	13	13	16	17	~~11~~	16	15	~~10~~
		27-45	29	29	29	28	28	28	27	27	27	26	26	26	25	25	25	25	25	25	24	24	24	22	22	22	20	20	20	19	19	19	18	18	18	16	16	16	15	15	15
80	B	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	18	14	14	16
		7-27	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	17
		27-45	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	37*	25	25	25	24	24	24	23	23	23	22	22	22	21	21	21	20	20	20	19	19	19	18	18	18
	C	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	16	14	14	14	14	13	12	14	17	~~11~~
		7-27	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	17	15	15	15	15	14	13	14	12	~~12~~
		27-45	37*	37*	37*	39*	39*	39*	25	25	25	24	24	24	23	23	23	23	23	23	22	22	22	21	21	21	20	20	20	18	18	18	17	17	17	16	16	16	15	15	15
	D	0-7	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	16	15	14	13	15	12	~~12~~	15	16	~~10~~	15	15	~~9~~
		7-27	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	17	16	15	14	16	13	13	15	17	~~11~~	14	15	~~10~~
		27-45	27	27	27	26	26	26	25	25	25	24	24	24	24	24	24	23	23	23	22	22	22	21	21	21	19	19	19	18	18	18	17	17	17	16	16	16	15	15	15
90	B	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	16
		7-27	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	31	31	22	30	30	19	29	26	17
		27-45	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	52*	51*	51*	51*	50*	50*	50*	52*	52*	52*	33	33	33	31	31	31	30	30	30	29	29	29	27	27	27	26	26	26
	C	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	16	12	12	14	12	12	12	12	17	~~11~~
		7-27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	28	31	31	23	31	31	20	30	27	17	29	24	15	28	21	13	27	18	~~12~~
		27-45	52*	52*	52*	50*	50*	50*	53*	53*	53*	33	33	33	33	33	33	32	32	32	31	31	31	29	29	29	28	28	28	26	26	26	25	25	25	23	23	23	22	22	22
	D	0-7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	16	14	14	13	14	12	~~12~~	14	16	~~10~~	14	15	~~9~~
		7-27	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	17	15	15	14	14	13	13	14	17	~~11~~	13	15	~~10~~
		27-45	38*	38*	38*	39	39	39	38	38	38	37	37	37	36	36	36	35	35	35	34	34	34	31	31	31	29	29	29	27	27	27	25	25	25	24	24	24	22	22	22
100	B	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	17	11	11	16
		7-27	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	25	25	25	25	25	25	22	25	25	19	25	25	17
		27-45	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	44*	47*	47*	47*	45*	45*	45*	30	30	30	29	29	29	28	28	28	27	27	27	26	26	26	24	24	24
	C	0-7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	16	11	11	14	11	11	12	11	17	~~11~~
		7-27	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	20	25	25	17	24	24	15	24	21	13	23	18	~~12~~
		27-45	44*	44*	44*	47*	47*	47*	46*	46*	46*	48*	48*	48*	30	30	30	30	30	30	29	29	29	27	27	27	26	26	26	25	25	25	23	23	23	22	22	22	21	21	21
	D	0-7	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	16	12	12	13	12	12	~~12~~	12	16	~~10~~	12	15	~~9~~
		7-27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	31	23	31	31	20	29	26	17	28	23	14	27	20	13	26	17	~~11~~	25	15	~~10~~
		27-45	54*	54*	54*	52*	52*	52*	33	33	33	32	32	32	31	31	31	30	30	30	29	29	29	28	28	28	26	26	26	24	24	24	23	23	23	22	22	22	20	20	20

* 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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	98	98	91	98	98	86	98	98	80	98	94	64	98	90	58	98	86	52	98	83	48	96	65	40	91	55	35	86	48	30	79	42	26	69	37	23	60	32	31
		7-27	98	98	89	98	98	85	98	98	79	98	94	69	98	90	62	98	87	56	98	84	52	98	69	43	94	58	37	89	50	32	85	44	28	77	39	25	67	34	33
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	98	92	62	98	88	55	98	84	49	98	75	44	96	64	40	92	59	37	89	53	34	84	45	28	73	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	98	93	67	98	89	59	98	85	53	98	79	48	98	69	43	96	62	39	93	56	36	87	48	31	82	41	26	70	35	34	60	31	30	53	27	26	47	24	23
		27-45	99	99	99	98	98	98	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	98	86	52	98	79	46	97	66	41	93	59	37	90	54	34	87	49	31	84	45	28	71	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	98	87	55	98	83	49	98	71	44	97	63	40	93	57	36	90	52	33	87	47	30	80	40	26	67	34	33	58	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	29	29
10	B	0-7	87	87	87	87	87	86	87	87	80	87	87	64	87	87	58	87	86	52	87	83	48	87	65	40	87	55	35	86	48	30	79	42	26	69	37	23	60	32	31
		7-27	87	87	87	87	87	85	87	87	79	87	87	69	87	87	62	87	87	56	87	84	52	87	69	43	87	58	37	87	50	32	85	44	28	77	39	25	67	34	33
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	94	94	94	90	89	89	86	84	84	78	73	73	69	63	63	62	55	55	55	49	49
	C	0-7	87	87	62	87	87	55	87	84	49	87	75	44	87	64	40	87	59	37	87	53	34	84	45	28	73	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	87	87	67	87	87	59	87	85	53	87	79	48	87	69	43	87	62	39	87	56	36	87	48	31	82	41	26	70	35	34	60	31	30	53	27	26	47	24	23
		27-45	98	98	98	97	97	97	95	95	95	92	92	92	90	89	89	88	86	86	85	83	83	75	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	87	86	52	87	79	46	87	66	41	87	59	37	87	54	34	87	49	31	84	45	28	71	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	87	87	55	87	83	49	87	71	44	87	63	40	87	57	36	87	52	33	87	47	30	80	40	26	67	34	33	58	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	96	96	96	93	93	93	90	90	90	88	86	86	86	83	83	80	76	76	74	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	29	29
20	B	0-7	64	64	64	64	64	64	64	64	64	64	64	64	64	64	58	64	64	52	64	64	48	64	64	40	64	55	35	64	48	30	64	42	26	64	37	23	60	32	31
		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	28	59	39	25	56	34	33
		27-45	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	90	90	89	89	89	86	86	86	82	82	82	75	73	73	68	63	63	62	55	55	55	49	49
	C	0-7	64	64	62	64	64	55	64	64	49	64	64	44	64	64	40	64	59	37	64	53	34	64	45	28	64	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	26	57	35	34	54	31	30	51	27	26	47	24	23
		27-45	91	91	91	91	91	91	89	89	89	88	88	88	86	86	86	84	84	84	80	80	80	72	69	69	65	58	58	57	50	50	50	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	26	56	34	33	53	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	91	91	91	89	89	89	87	87	87	86	86	86	83	83	83	78	76	76	73	68	68	63	57	57	55	49	49	49	42	42	43	37	37	38	33	33	34	29	29
30	B	0-7	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	52	63	63	48	63	63	40	63	55	35	63	48	30	63	42	26	63	37	23	60	32	31
		7-27	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	56	65	65	52	65	65	43	65	58	37	64	50	32	61	44	28	59	39	25	56	34	33
		27-45	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	83	83	83	77	77	77	71	71	71	66	66	66	61	61	61	56	55	55	52	49	49
	C	0-7	63	63	62	63	63	55	63	63	49	63	63	44	63	63	40	63	59	37	63	53	34	63	45	28	63	39	24	62	33	32	54	29	28	48	26	24	42	23	22
		7-27	65	65	65	65	65	59	65	65	53	65	65	48	65	65	43	65	62	39	65	56	36	63	48	31	60	41	26	57	35	34	54	31	30	51	27	26	47	24	23
		27-45	86	86	86	86	86	86	84	84	84	80	80	80	77	77	77	73	73	73	70	70	70	64	64	64	58	58	58	53	50	50	49	44	44	45	39	39	40	34	34
	D	0-7	64	64	52	64	64	46	64	64	41	64	59	37	64	54	34	64	49	31	64	45	28	64	38	24	60	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	65	65	55	65	65	49	65	65	44	65	63	40	65	57	36	64	52	33	63	47	30	59	40	26	56	34	33	53	30	29	50	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	86	86	86	85	85	85	81	81	81	77	77	77	73	73	73	69	69	69	65	65	65	59	57	57	54	49	49	49	42	42	43	37	37	38	33	33	34	29	29
40	B	0-7	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	40	52	52	35	52	48	30	52	42	26	52	37	23	52	32	31
		7-27	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	43	55	55	37	54	50	32	52	44	28	50	39	25	49	34	33
		27-45	78	78	78	78	78	78	78	78	78	78	78	78	77	77	77	75	75	75	72	72	72	68	68	68	63	63	63	59	59	59	55	55	55	51	51	51	48	48	48
	C	0-7	52	52	52	52	52	52	52	52	49	52	52	44	52	52	40	52	52	37	52	52	34	52	45	28	52	39	24	52	33	32	52	29	28	48	26	24	42	23	22
		7-27	55	55	55	55	55	55	55	55	53	55	55	48	55	55	43	55	55	39	55	55	36	53	48	31	51	41	26	49	35	34	47	31	30	45	27	26	43	24	23
		27-45	78	78	78	76	76	76	73	73	73	70	70	70	67	67	67	65	65	65	62	62	62	57	57	57	53	53	53	49	49	49	45	44	44	42	39	39	39	34	34
	D	0-7	56	56	52	56	56	46	56	56	41	56	56	37	56	54	34	56	49	31	56	45	28	56	38	24	56	32	31	52	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	59	59	55	59	59	49	59	59	44	59	59	40	59	57	36	58	52	33	57	47	30	54	40	26	52	34	33	49	30	29	46	26	25	44	34	~~22~~	39	31	~~20~~
		27-45	79	79	79	75	75	75	72	72	72	68	68	68	65	65	65	62	62	62	59	59	59	54	54	54	50	49	49	45	42	42	42	37	37	38	33	33	34	29	29
50	B	0-7	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	43	35	43	43	30	43	42	26	43	37	23	43	32	31
		7-27	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	37	46	46	32	45	44	28	44	39	25	42	34	33
		27-45	69	69	69	69	69	69	69	69	69	69	69	69	68	68	68	66	66	66	64	64	64	60	60	60	57	57	57	53	53	53	50	50	50	47	47	47	44	44	44
	C	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	43	34	43	43	28	43	39	24	43	33	32	43	29	28	43	26	24	42	23	22
		7-27	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	39	46	46	36	46	46	31	44	41	26	43	35	34	41	31	30	39	27	26	38	24	23
		27-45	69	69	69	67	67	67	65	65	65	62	62	62	60	60	60	58	58	58	56	56	56	52	52	52	48	48	48	45	45	45	42	42	42	39	39	39	36	34	34
	D	0-7	47	47	47	47	47	46	47	47	41	47	47	37	47	47	34	47	47	31	47	45	28	47	38	24	47	32	31	47	28	27	45	24	23	40	33	~~21~~	35	29	~~18~~
		7-27	51	51	51	51	51	49	51	51	44	51	51	40	51	51	36	50	50	33	49	47	30	47	40	26	45	34	33	43	30	29	41	26	25	39	34	~~22~~	37	31	~~20~~
		27-45	70	70	70	67	67	67	64	64	64	62	62	62	59	59	59	57	57	57	54	54	54	50	50	50	46	46	46	42	42	42	39	37	37	36	33	33	33	29	29

* 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 7-10	II	30 ft	Ss = 3.00	22.78 sq.ft	LANDSCAPE	CROSS-SLOPE	SML	UAF	SM BUTYL OSB
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)	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	36	36	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	30	36	36	26	36	36	23	36	32	31
		7-27	39	39	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	39	28	39	39	25	38	34	33
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	58	58	58	55	55	55	52	52	52	49	49	49	46	46	46	44	44	44	41	41	41
	C	0-7	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	28	36	36	24	36	33	32	36	29	28	36	26	24	36	23	22
		7-27	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	31	39	39	26	38	35	34	36	31	30	35	27	26	34	24	23
		27-45	61	61	61	60	60	60	58	58	58	56	56	56	55	55	55	53	53	53	51	51	51	48	48	48	45	45	45	42	42	42	39	39	39	36	36	36	34	34	34
	D	0-7	40	40	40	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	40	28	40	38	24	40	32	31	40	28	27	40	24	23	39	33	~~21~~	35	29	~~18~~
		7-27	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	43	33	43	43	30	42	40	26	40	34	33	39	30	29	37	26	25	35	34	~~22~~	34	31	~~20~~
		27-45	63	63	63	61	61	61	58	58	58	56	56	56	54	54	54	52	52	52	50	50	50	46	46	46	43	43	43	40	40	40	37	37	37	34	33	33	32	29	29
70	B	0-7	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	30	31	31	26	31	31	23	31	31	31
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	28	34	34	25	34	34	33
		27-45	56	56	56	56	56	56	56	56	56	56	56	56	55	55	55	54	54	54	52	52	52	50	50	50	47	47	47	45	45	45	43	43	43	41	41	41	38	38	38
	C	0-7	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	31	32	31	29	28	31	26	24	31	23	22
		7-27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	26	34	34	34	33	31	30	32	27	26	31	24	23
		27-45	56	56	56	54	54	54	53	53	53	51	51	51	50	50	50	48	48	48	47	47	47	44	44	44	41	41	41	39	39	39	37	37	37	34	34	34	32	32	32
	D	0-7	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	34	24	34	32	31	34	28	27	34	24	23	34	33	~~21~~	34	29	~~18~~
		7-27	37	37	37	37	37	37	37	37	37	37	37	37	37	37	36	37	37	33	37	37	30	37	37	26	36	34	33	35	30	29	34	26	25	32	34	~~22~~	31	31	~~20~~
		27-45	57	57	57	55	55	55	53	53	53	52	52	52	50	50	50	48	48	48	46	46	46	43	43	43	40	40	40	37	37	37	35	35	35	32	32	32	30	29	29
80	B	0-7	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	27	27	31
		7-27	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	28	30	30	25	30	30	33
		27-45	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	49	49	48	48	48	46	46	46	44	44	44	42	42	42	40	40	40	38	38	38	36	36	36
	C	0-7	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	32	27	27	28	27	26	24	27	23	22
		7-27	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	26	30	30	34	30	30	30	29	27	26	28	24	23
		27-45	50	50	50	50	50	50	48	48	48	47	47	47	46	46	46	45	45	45	43	43	43	41	41	41	39	39	39	36	36	36	34	34	34	32	32	32	30	30	30
	D	0-7	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	24	30	30	31	30	28	27	30	24	23	30	33	~~21~~	30	29	~~18~~
		7-27	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	26	33	33	33	32	30	29	31	26	25	30	34	~~22~~	29	31	~~20~~
		27-45	53	53	53	51	51	51	49	49	49	48	48	48	46	46	46	45	45	45	43	43	43	41	41	41	38	38	38	35	35	35	33	33	33	31	31	31	29	29	29
90	B	0-7	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	31
		7-27	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	56	60	60	49	60	60	43	59	58	38	58	52	33
		27-45	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	67	67	64	64	64	61	61	61	58	58	58	56	56	56	53	53	53	51	51	51
	C	0-7	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	32	24	24	28	24	24	24	24	23	22
		7-27	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	54	60	60	46	60	60	40	58	53	34	56	47	30	54	41	26	52	36	23
		27-45	68	68	68	68	68	68	67	67	67	65	65	65	64	64	64	62	62	62	61	61	61	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	43	43	43
	D	0-7	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	27	27	27	24	23	27	33	~~21~~	27	29	~~18~~
		7-27	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	29	33	29	29	29	28	26	25	27	34	~~22~~	27	31	~~20~~
		27-45	75	75	75	75	75	75	75	75	75	73	73	73	70	70	70	68	68	68	66	66	66	61	61	61	57	57	57	53	53	53	50	50	50	47	47	47	44	44	44
100	B	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	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
		7-27	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	48	38	48	48	33
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	57	57	57	55	55	55	53	53	53	50	50	50	48	48	48
	C	0-7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	32	22	22	28	22	22	24	22	22	22
		7-27	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	48	34	48	47	30	47	41	26	45	36	23
		27-45	61	61	61	61	61	61	61	61	61	61	61	61	59	59	59	58	58	58	57	57	57	54	54	54	51	51	51	49	49	49	46	46	46	44	44	44	41	41	41
	D	0-7	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	27	24	24	23	24	33	~~21~~	24	29	~~18~~
		7-27	60	60	60	60	60	60	60	60	60	60	60	60	60	60	55	60	60	50	60	60	46	60	60	39	58	52	33	55	45	29	53	39	25	51	34	~~22~~	49	31	~~20~~
		27-45	68	68	68	66	66	66	64	64	64	62	62	62	61	61	61	59	59	59	57	57	57	54	54	54	51	51	51	48	48	48	45	45	45	42	42	42	40	40	40

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