Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

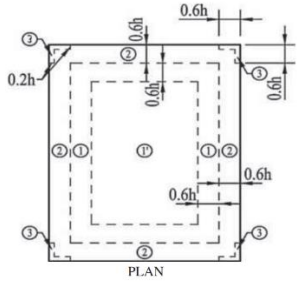
Seismic Design Assumptions

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

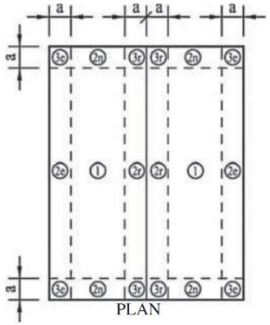
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

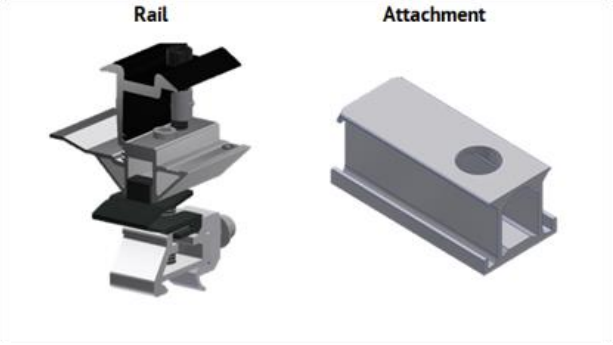
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Micro Rail - SFM Slider

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ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	102	106	106	96	106	102	86	106	92	78	104	84	71	95	78	65	88	72	60	81	67	50
			Exposed	106	106	106	106	106	100	106	106	93	106	104	87	106	97	82	106	92	77	106	87	73	96	78	66	87	71	58	79	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	105	107	107	98	107	98	87	107	88	78	101	79	71	90	72	63	83	67	51	78	57	42
			Exposed	107	107	107	107	107	103	107	107	95	107	100	88	107	93	82	107	87	77	107	82	73	91	73	64	82	66	49	76	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	106	107	98	94	107	88	84	102	81	76	93	74	70	86	69	60
			Exposed	107	107	107	107	107	107	107	107	107	107	107	107	107	104	99	107	97	93	107	91	87	102	81	77	92	73	69	84	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	105	108	108	94	108	99	86	108	90	79	100	83	72	92	77	67
			Exposed	108	108	108	108	108	108	108	108	108	108	108	107	108	108	100	108	108	94	108	102	88	108	91	79	99	82	72	89	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	106	106	106	106	106	105	106	106	98	106	106	91	106	102	86	106	96	81	106	91	76	100	82	69	91	74	62	83	68	52	76	63	43	71	58	37	66	49	31
			Exposed	106	101	85	106	94	79	106	88	74	102	83	70	96	78	65	90	74	62	85	70	56	77	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	107	107	107	107	107	107	107	107	100	107	105	93	107	98	87	107	92	81	107	86	76	96	77	68	85	69	55	79	59	44	73	48	38	66	40	33	57	36	27
			Exposed	107	98	86	107	90	80	107	83	74	98	78	69	91	73	63	85	68	54	81	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	106	107	102	97	107	96	92	107	85	81	97	77	73	88	70	63	80	64	50	74	53	41	69	44	35
			Exposed	107	107	105	107	100	96	107	93	89	107	87	82	102	81	77	96	76	72	90	72	68	81	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	105	108	108	98	108	107	92	108	95	83	105	86	75	94	78	68	85	72	63	78	66	52	71	61	44
			Exposed	108	108	104	108	108	97	108	104	90	108	97	84	108	91	79	104	85	74	97	81	70	86	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	106	106	101	106	106	93	106	103	87	106	97	81	106	91	77	106	86	72	100	81	68	90	73	62	81	67	50	74	61	41	68	54	35	63	45	29	59	38	24
			Exposed	106	91	76	104	84	71	97	79	66	91	74	62	85	70	56	81	66	49	76	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	107	107	104	107	107	95	107	100	88	107	92	82	107	86	77	107	81	72	96	76	68	84	68	54	77	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	107	86	76	102	80	71	92	74	66	85	69	56	81	64	47	77	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	103	98	107	96	92	107	90	86	107	85	81	95	76	72	86	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	107	96	92	107	89	84	104	82	78	97	77	73	91	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	108	108	108	108	108	108	108	108	106	108	108	99	108	107	93	108	101	87	108	95	82	103	85	74	92	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	108	107	93	108	99	86	108	92	80	105	86	75	97	81	70	91	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
10	B	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	86	89	89	78	89	84	71	89	78	65	88	72	60	81	67	50			
			Exposed	89	89	89	89	89	89	89	89	89	89	89	87	89	89	82	89	89	77	89	87	73	89	78	66	87	71	58	79	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	88	78	90	79	71	90	72	63	83	67	51	78	57	42
			Exposed	90	90	90	90	90	90	90	90	90	90	90	88	90	90	82	90	87	77	90	82	73	90	73	64	82	66	49	76	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	98	94	103	88	84	102	81	76	93	74	70	86	69	60
			Exposed	103	103	103	103	103	103	103	103	103	103	103	103	103	103	99	103	97	93	103	91	87	102	81	77	92	73	69	84	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	105	106	106	94	106	99	86	106	90	79	100	83	72	92	77	67
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	100	106	106	94	106	102	88	106	91	79	99	82	72	89	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	86	89	89	81	89	89	76	89	82	69	89	74	62	83	68	52	76	63	43	71	58	37	66	49	31
			Exposed	89	89	85	89	89	79	89	88	74	89	83	70	89	78	65	89	74	62	85	70	56	77	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	90	81	90	86	76	90	77	68	85	69	55	79	59	44	73	48	38	66	40	33	57	36	27
			Exposed	90	90	86	90	90	80	90	83	74	90	78	69	90	73	63	85	68	54	81	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	98	94	103	88	84	102	81	76	93	74	70	86	69	60
			Exposed	103	103	103	103	103	103	103	103	103	103	103	103	103	103	99	103	97	93	103	91	87	102	81	77	92	73	69	84	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	105	106	106	94	106	99	86	106	90	79	100	83	72	92	77	67
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	100	106	106	94	106	102	88	106	91	79	99	82	72	89	75	65	81	69	57	74	64	47	68	55	40
	D	0-7	Interior	89	89	89	89	89	89	89	89	87	89	89	81	89	89	77	89	86	72	89	81	68	89	73	62	81	67	50	74	61	41	68	54	35	63	45	29	59	38	24
			Exposed	89	89	76	89	84	71	89	79	66	89	74	62	85	70	56	81	66	49	76	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	90	90	90	90	90	90	90	90	88	90	90	82	90	86	77	90	81	72	90	76	68	84	68	54	77	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	90	86	76	90	80	71	90	74	66	85	69	56	81	64	47	77	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	104	104	104	104	104	104	104	104	104	104	103	98	104	96	92	104	90	86	104	85	81	95	76	72	86	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	104	96	92	104	89	84	104	82	78	97	77	73	91	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	108	108	108	108	108	108	108	108	106	108	108	99	108	107	93	108	101	87	108	95	82	103	85	74	92	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	108	107	93	108	99	86	108	92	80	105	86	75	97	81	70	91	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
20	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	65	74	72	60	74	67	50			
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	66	74	71	58	74	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	72	63	75	67	51	75	57	42
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	73	64	75	66	49	75	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	88	84	91	81	76	91	74	70	86	69	60
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	87	91	81	77	91	73	69	84	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	94	96	96	86	96	90	79	96	83	72	92	77	67
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	94	96	96	88	96	91	79	96	82	72	89	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	74	62	74	68	52	74	63	43	71	58	37	66	49	31
			Exposed	74	74	74	74	74	74	74	74	74	74	74	70	74	74	65	74	74	62	74	70	56	74	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	69	55	75	59	44	73	48	38	66	40	33	57	36	27
			Exposed	75	75	75	75	75	75	75	75	74	75	75	69	75	73	63	75	68	54	75	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	81	91	77	73	88	70	63	80	64	50	74	53	41	69	44	35
			Exposed	91	91	91	91	91	91	91	91	89	91	87	82	91	81	77	91	76	72	90	72	68	81	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
			Exposed	96	96	96	96	96	96	96	96	90	96	96	84	96	91	79	96	85	74	96	81	70	86	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	73	62	74	67	50	74	61	41	68	54	35	63	45	29	59	38	24
			Exposed	74	74	74	74	74	71	74	74	66	74	74	62	74	70	56	74	66	49	74	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	68	75	68	54	75	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	75	75	75	75	75	71	75	74	66	75	69	56	75	64	47	75	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	92	93	90	86	93	85	81	93	76	72	86	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	93	93	92	93	89	84	93	82	78	93	77	73	91	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	93	98	98	87	98	95	82	98	85	74	92	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	98	98	93	98	98	86	98	92	80	98	86	75	97	81	70	91	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	65	73	72	60	73	67	50
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	66	73	71	58	73	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	72	63	75	67	51	75	57	42
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	73	64	75	66	49	75	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	76	83	74	70	83	69	60
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	77	83	73	69	83	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	88	79	88	83	72	88	77	67
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	79	88	82	72	88	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	69	73	73	62	73	68	52	73	63	43	71	58	37	66	49	31
			Exposed	73	73	73	73	73	73	73	73	73	73	70	73	73	65	73	73	62	73	70	56	73	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	69	55	75	59	44	73	48	38	66	40	33	57	36	27
			Exposed	75	75	75	75	75	75	75	75	74	75	75	69	75	73	63	75	68	54	75	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	77	83	77	73	83	70	63	80	64	50	74	53	41	69	44	35
			Exposed	83	83	83	83	83	83	83	83	83	83	83	82	83	81	77	83	76	72	83	72	68	81	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	83	88	86	75	88	78	68	85	72	63	78	66	52	71	61	44
			Exposed	88	88	88	88	88	88	88	88	88	88	88	84	88	88	79	88	85	74	88	81	70	86	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	73	62	74	67	50	74	61	41	68	54	35	63	45	29	59	38	24
			Exposed	74	74	74	74	74	71	74	74	66	74	74	62	74	70	56	74	66	49	74	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	68	75	68	54	75	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	75	75	75	75	75	71	75	74	66	75	69	56	75	64	47	75	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	76	72	85	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	85	85	85	85	85	84	85	82	78	85	77	73	85	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	90	82	90	85	74	90	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	90	90	90	90	90	86	90	90	80	90	86	75	90	81	70	90	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
40	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	60	67	67	50
			Exposed	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	58	67	65	47	67	60	40	67	52	33	63	44	28
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	63	69	67	51	69	57	42
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	69	66	49	69	53	40	69	43	35	61	38	29	53	32	24
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	70	76	69	60
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	69	76	67	55	76	57	44	71	47	37	66	40	32
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	72	82	77	67
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	72	82	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	52	67	63	43	67	58	37	66	49	31
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	62	67	67	56	67	63	44	67	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	55	69	59	44	69	48	38	66	40	33	57	36	27
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	63	69	68	54	69	64	47	69	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	76	73	76	70	63	76	64	50	74	53	41	69	44	35
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	72	68	76	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	75	82	78	68	80	72	63	78	66	52	71	61	44
			Exposed	82	82	82	82	82	82	82	82	82	82	82	79	82	82	74	82	81	70	82	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25			
	D	0-7	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	62	69	67	50	69	61	41	68	54	35	63	45	29	59	38	24
			Exposed	69	69	69	69	69	69	69	69	66	69	69	62	69	69	56	69	66	49	69	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	68	54	71	56	42	71	45	36	62	38	30	54	33	24	42	27	20
			Exposed	71	71	71	71	71	71	71	71	66	71	69	56	71	64	47	71	55	41	71	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	72	78	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	78	78	78	78	78	78	78	78	78	77	73	78	72	68	78	68	58	78	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15			
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	84	84	74	84	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	84	84	84	84	84	84	84	84	80	84	84	75	84	81	70	84	76	66	84	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
50	B	0-7	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	50	60	60	50
			Exposed	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	58	60	60	47	60	60	40	60	52	33	60	44	28
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	51	63	57	42
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	49	63	53	40	63	43	35	61	38	29	53	32	24
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	69	60
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	67	55	71	57	44	71	47	37	66	40	32
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	72	76	76	67
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	72	77	75	65	77	69	57	74	64	47	68	55	40
	C	0-7	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	52	60	60	43	60	58	37	60	49	31
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	46	59	38	24	50	32	20	42	27	18
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	55	63	59	44	63	48	38	63	40	33	57	36	27
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	54	63	63	47	63	49	38	63	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	64	50	71	51	40	67	41	33	62	36	28	55	30	23	46	25	19
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	63	71	64	50	71	53	41	69	44	35
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	68	75	72	63	73	66	52	71	61	44
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	70	77	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	50	63	61	41	63	54	35	63	45	29	59	38	24
			Exposed	63	63	63	63	63	63	63	63	63	63	63	62	63	63	56	63	63	49	63	63	43	63	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	54	66	56	42	66	45	36	62	38	30	54	33	24	42	27	20
			Exposed	66	66	66	66	66	66	66	66	66	66	66	56	66	64	47	66	55	41	66	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	73	68	59	73	60	46	72	49	38	66	41	32	62	36	28
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	72	68	73	68	58	73	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	74	79	77	67	77	70	59	75	64	48	69	56	41	58	47	35
			Exposed	79	79	79	79	79	79	79	79	79	79	79	75	79	79	70	79	76	66	79	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50
			Exposed	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	47	55	55	40	55	52	33	55	44	28
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	51	58	57	42
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	53	40	58	43	35	58	38	29	53	32	24
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	60
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	55	67	57	44	67	47	37	66	40	32
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	72	72	67
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	73	73	65	73	69	57	73	64	47	68	55	40
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	43	55	55	37	55	49	31
			Exposed	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	36	55	46	29	55	38	24	50	32	20
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	44	58	48	38	58	40	33	57	36	27
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	47	58	49	38	58	40	32	54	34	25	42	27	20	36	22	18	31	19	16		
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	64	50	67	51	40	67	41	33	62	36	28	55	30	23
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	64	50	67	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	72	68	71	71	63	69	66	52	68	61	44
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	72	63	73	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	50	58	58	41	58	54	35	58	45	29	58	38	24
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	58	49	58	58	43	58	55	35	58	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	56	42	61	45	36	61	38	30	54	33	24	42	27	20
			Exposed	61	61	61	61	61	61	61	61	61	61	61	56	61	61	47	61	55	41	61	48	38	61	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	59	69	60	46	69	49	38	66	41	32	62	36	28
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	68	58	69	64	50	69	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	74	74	67	73	70	59	71	64	48	69	56	41	58	47	35
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	75	66	75	72	63	75	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
70	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	40	51	51	33	51	44	28
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	42
			Exposed	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	53	40	54	43	35	54	38	29	53	32	24
		20-27	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	55	62	57	44	62	47	37	62	40	32
		27-45	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	68	67
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	65	69	69	57	69	64	47	68	55	40
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	43	51	51	37	51	49	31
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	36	51	46	29	51	38	24	50	32	20	42	27	18
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	44	54	48	38	54	40	33	54	36	27
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	47	54	49	38	54	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	50	62	51	40	62	41	33	62	36	28
		27-45	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	63	69	66	51	68	57	41	57	47	35
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
	D	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	50	54	54	41	54	54	35	54	45	29	54	38	24
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	54	43	54	54	35	54	44	28	54	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	42	56	45	36	56	38	30	54	33	24	42	27	20
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	47	56	55	41	56	48	38	56	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	60	46	65	49	38	65	41	32	62	36	28
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	58	65	64	50	65	49	39	65	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	69	69	59	68	64	48	66	56	41	58	47	35
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	71	63	71	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
80	B	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
			Exposed	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	47	48	48	40	48	48	33	48	44	28
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	40	50	43	35	50	38	29	50	32	24
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	57	44	58	47	37	58	40	32
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	65	65
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	66	66	57	66	64	47	65	55	40
	C	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	31
			Exposed	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	37	48	48	31
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	27
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	48	48	38	48	48	38	48	40	33	50	36	27
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	50	58	51	40	58	41	33	58	36	28
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	65	65	64	64	63	63	63	52
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	63	66	66	51	65	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	41	51	51	35	51	45	29	51	38	24
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	43	51	51	35	51	44	28	51	36	23	47	30	19	39	25	17	33	22	15		
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	42	53	45	36	53	38	30	53	33	24	42	27	20
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	47	53	53	41	53	48	38	53	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	60	46	61	49	38	61	41	32	61	36	28
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	58	61	61	50	61	49	39	61	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	67	67	66	66	59	65	64	48	63	56	41	58	47	35
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	68	63	68	65	49	67	55	40	54	44	33	43	38	27	38	32	23	33	27	19			

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	33	46	44	28		
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42		
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	40	47	43	35	47	38	29	47	32	24
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	47	37	55	40	32
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	62	47	62	55	40
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	37	46	46	31
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	36	46	46	29	46	38	24
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	38	47	40	33
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	38	47	40	32	47	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	53	41	55	44	35
			Exposed	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	51	40	55	41	33	55	36	28	55	30	23	46	25	19
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	61	60	60	52	59	59	44
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	51	62	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	41	48	48	35	48	45	29	48	38	24						
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	35	48	44	28	48	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	50	45	36	50	38	30	50	33	24	42	27	20			
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	41	50	48	38	50	39	31	50	32	24	40	26	20	34	21	17	29	18	15	26	16	13	
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	46	58	49	38	58	41	32	58	36	28
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	50	58	49	39	58	40	32	58	34	26	51	28	21	42	23	18
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	63	59	62	62	48	61	56	41	58	47	35
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	49	65	55	40	54	44	33	43	38	27	38	32	23	33	27	19
100	B	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	33	43	43	28
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42		
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	43	35	45	38	29	45	32	24
		20-27	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	44	52	47	37	52	40	32
		27-45	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	57	59	59	47	59	55	40
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	31
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	29	43	38	24
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	38	45	40	33	45	36	27
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	38	45	40	32	45	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	50	52	52	41	52	44	35
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	50	52	51	40	52	41	33	52	36	28	52	30	23	46	25	19
		27-45	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	58	58	52	57	57	44
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	51	59	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	45	29	46	38	24						
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	35	46	44	28	46	36	23	46	30	19	39	25	17	33	22	15
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42	47	45	36	47	38	30	47	33	24	42	27	20			
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	41	47	47	38	47	39	31	47	32	24	40	26	20	34	21	17	29	18	15	26	16	13	
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	46	55	49	38	55	41	32	55	36	28
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	39	55	40	32	55	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	61	61	59	60	60	48	59	56	41	58	47	35
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	55	40	54	44	33	43	38	27	38	32	23	33	27	19

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	136	138	138	125	138	138	116	138	127	105	138	114	95	129	104	87	117	96	80	108	89	74	100	83	69
			Exposed	138	138	135	138	138	122	138	138	113	138	129	106	138	119	100	138	113	94	134	107	89	118	96	80	107	88	73	98	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	125	138	137	115	138	116	103	138	104	93	138	95	84	112	87	77	101	80	71	91	74	66
			Exposed	138	138	138	138	138	121	138	131	112	138	118	104	138	110	98	138	103	92	138	97	87	113	87	78	99	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	135	124	139	117	109	139	106	99	124	97	90	113	89	83	105	83	76
			Exposed	139	139	139	139	139	139	139	139	139	139	138	128	139	125	116	139	116	108	139	109	102	125	97	91	112	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	128	140	135	114	140	119	103	134	109	95	117	101	88	107	93	81
			Exposed	140	140	140	140	140	140	140	140	140	140	140	131	140	140	120	140	134	113	140	123	106	136	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	138	138	138	138	138	130	138	138	119	138	137	111	138	126	104	138	118	98	138	111	93	124	101	84	111	92	76	102	84	70	94	78	65	87	72	60	81	67	52
			Exposed	138	126	104	138	116	97	137	109	91	126	102	85	117	96	80	111	91	76	105	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	138	138	138	138	138	132	138	138	118	138	126	110	138	116	103	138	109	96	138	102	91	127	91	81	105	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	138	115	102	138	107	95	138	99	88	138	93	83	113	87	77	104	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	134	123	139	122	114	139	114	107	133	102	95	117	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	139	134	123	139	119	112	139	111	104	136	104	97	124	97	90	116	92	85	109	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	128	140	140	118	140	132	111	140	115	100	122	104	91	109	95	83	100	87	76	92	81	71	85	75	66
			Exposed	140	140	127	140	140	116	140	126	108	140	117	101	135	110	95	120	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	138	138	123	138	138	113	138	129	106	138	119	99	138	112	93	132	106	88	123	100	83	110	90	75	100	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	138	112	93	129	104	87	119	97	81	112	92	76	105	86	72	99	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	138	138	123	138	131	112	138	118	104	138	110	97	138	103	91	138	96	86	121	91	81	103	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	138	102	91	138	95	84	115	88	79	105	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	115	115	139	108	101	132	101	95	115	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	139	114	107	139	106	99	127	99	92	117	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	140	140	140	140	140	140	140	140	131	140	140	119	140	132	112	140	122	105	140	114	99	119	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	140	132	111	140	119	104	140	111	97	122	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
10	B	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	105	115	114	95	115	104	87	115	96	80	108	89	74	100	83	69
			Exposed	115	115	115	115	115	115	115	115	113	115	115	106	115	115	100	115	113	94	115	107	89	115	96	80	107	88	73	98	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	115	116	116	103	116	104	93	116	95	84	112	87	77	101	80	71	91	74	66
			Exposed	116	116	116	116	116	116	116	116	112	116	116	104	116	110	98	116	103	92	116	97	87	113	87	78	99	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	124	133	117	109	133	106	99	124	97	90	113	89	83	105	83	76
			Exposed	133	133	133	133	133	133	133	133	133	133	133	128	133	125	116	133	116	108	133	109	102	125	97	91	112	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	128	138	135	114	138	119	103	134	109	95	117	101	88	107	93	81
			Exposed	138	138	138	138	138	138	138	138	138	138	138	131	138	138	120	138	134	113	138	123	106	136	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	111	115	115	104	115	115	98	115	111	93	115	101	84	111	92	76	102	84	70	94	78	65	87	72	60	81	67	52
			Exposed	115	115	104	115	115	97	115	109	91	115	102	85	115	96	80	111	91	76	105	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	110	116	116	103	116	109	96	116	102	91	116	91	81	105	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	116	115	102	116	107	95	116	99	88	116	93	83	113	87	77	104	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	133	133	133	133	133	133	133	133	133	133	133	133	133	133	123	133	122	114	133	114	107	133	102	95	117	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	133	133	123	133	119	112	133	111	104	133	104	97	124	97	90	116	92	85	109	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	131	138	138	120	138	134	113	138	123	106	136	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
			Exposed	138	138	127	138	138	116	138	126	108	138	117	101	135	110	95	120	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	115	115	115	115	115	113	115	115	106	115	115	99	115	112	93	115	106	88	115	100	83	110	90	75	100	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	115	112	93	115	104	87	115	97	81	112	92	76	105	86	72	99	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	116	116	116	116	116	112	116	116	104	116	110	97	116	103	91	116	96	86	116	91	81	103	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	116	102	91	116	95	84	115	88	79	105	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	134	134	134	134	134	134	134	134	127	134	124	115	134	115	107	134	108	101	132	101	95	115	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	134	114	107	134	106	99	127	99	92	117	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	139	139	139	139	139	139	139	139	131	139	139	119	139	132	112	139	122	105	139	114	99	119	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	139	132	111	139	119	104	139	111	97	122	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
20	B	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	96	96	87	96	96	80	96	89	74	96	83	69	96	83	69
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	94	96	96	89	96	96	80	96	88	73	96	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	93	97	95	84	97	87	77	97	80	71	91	74	66	91	74	66
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	92	97	97	87	97	87	78	97	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	109	118	106	99	118	97	90	113	89	83	105	83	76	105	83	76
			Exposed	118	118	118	118	118	118	118	118	118	118	118	118	118	118	116	118	116	108	118	109	102	118	97	91	112	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	114	124	119	103	124	109	95	117	101	88	107	93	81	107	93	81
			Exposed	124	124	124	124	124	124	124	124	124	124	124	124	124	124	120	124	124	113	124	123	106	124	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	96	84	96	92	76	96	84	70	94	78	65	87	72	60	81	67	52
			Exposed	96	96	96	96	96	96	96	96	91	96	96	85	96	96	80	96	91	76	96	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	96	97	97	91	97	91	81	97	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	97	97	97	97	97	95	97	97	88	97	93	83	97	87	77	97	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	114	118	114	107	118	102	95	117	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	118	118	118	118	118	112	118	111	104	118	104	97	118	97	90	116	92	85	109	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	118	124	124	111	124	115	100	122	104	91	109	95	83	100	87	76	92	81	71	85	75	66
			Exposed	124	124	124	124	124	116	124	124	108	124	117	101	124	110	95	120	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	96	88	96	96	83	96	90	75	96	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	96	96	93	96	96	87	96	96	81	96	92	76	96	86	72	96	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	91	97	96	86	97	91	81	97	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	97	97	91	97	95	84	97	88	79	97	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	120	120	120	120	120	120	120	120	120	120	120	115	120	115	107	120	108	101	120	101	95	115	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	120	114	107	120	106	99	120	99	92	117	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	126	126	126	126	126	126	126	126	126	126	126	119	126	126	112	126	122	105	126	114	99	119	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	126	126	111	126	119	104	126	111	97	122	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	87	95	95	80	95	89	74	95	83	69
			Exposed	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	94	95	95	89	95	95	80	95	88	73	95	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	95	84	97	87	77	97	80	71	91	74	66
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	92	97	97	87	97	87	78	97	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	99	107	97	90	107	89	83	105	83	76
			Exposed	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	102	107	97	91	107	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	103	114	109	95	114	101	88	107	93	81
			Exposed	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	113	114	114	106	114	110	96	114	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	84	95	92	76	95	84	70	94	78	65	87	72	60	81	67	52
			Exposed	95	95	95	95	95	95	95	95	91	95	95	85	95	95	80	95	91	76	95	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	96	97	97	91	97	91	81	97	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	97	97	97	97	97	95	97	97	88	97	93	83	97	87	77	97	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	102	95	107	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	107	107	107	107	107	107	107	107	104	107	104	97	107	97	90	107	92	85	107	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	111	114	114	100	114	104	91	109	95	83	100	87	76	92	81	71	85	75	66
			Exposed	114	114	114	114	114	114	114	114	108	114	114	101	114	110	95	114	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	96	88	96	96	83	96	90	75	96	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	96	96	93	96	96	87	96	96	81	96	92	76	96	86	72	96	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	91	97	96	86	97	91	81	97	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	97	97	91	97	95	84	97	88	79	97	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	110	110	110	110	110	110	110	110	110	110	110	110	110	110	107	110	108	101	110	101	95	110	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	110	110	107	110	106	99	110	99	92	110	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	117	117	117	117	117	117	117	117	117	117	117	117	117	117	112	117	117	105	117	114	99	117	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	117	117	111	117	117	104	117	111	97	117	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
40	B	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	86	80	86	86	74	86	83	69
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	86	73	86	81	67	86	74	62	83	69	56	78	65	47
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	84	89	87	77	89	80	71	89	74	66
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	89	87	78	89	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	90	98	89	83	98	83	76			
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	91	98	88	82	98	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	103	106	106	95	106	101	88	104	93	81
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	96	106	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	86	86	76	86	84	70	86	78	65	86	72	60	81	67	52
			Exposed	86	86	86	86	86	86	86	86	86	86	85	86	86	80	86	86	86	76	86	86	72	86	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	81	89	83	74	89	75	67	84	69	62	76	64	55	70	59	45
			Exposed	89	89	89	89	89	89	89	89	88	89	89	83	89	87	77	89	82	73	89	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	95	98	92	86	98	84	78	98	77	71	90	71	66	84	66	58
			Exposed	98	98	98	98	98	98	98	98	98	98	98	97	98	97	90	98	92	85	98	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	100	106	104	91	104	95	83	100	87	76	92	81	71	85	75	66
			Exposed	106	106	106	106	106	106	106	106	106	106	106	101	106	106	95	106	103	90	106	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	88	89	89	83	89	89	75	89	82	69	89	76	63	85	70	58	78	65	48	73	61	41
			Exposed	89	89	89	89	89	87	89	89	81	89	89	76	89	86	72	89	82	68	89	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	92	86	92	91	81	92	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	92	92	91	92	92	84	92	88	79	92	83	74	92	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	101	102	101	95	102	91	84	102	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	102	102	102	102	102	99	102	99	92	102	92	86	102	87	80	102	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	105	109	109	99	109	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	109	109	109	109	109	104	109	109	97	109	104	91	109	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
50	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	69			
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	78	67	78	74	62	78	69	56	78	65	47
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	80	71	81	74	66
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	78	81	79	70	81	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	89	83	92	83	76
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	88	82	92	80	74	92	74	68	86	68	63	80	63	53
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	88	97	93	81
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	99	99	87	99	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	78	70	78	78	65	78	72	60	78	67	52
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	78	72	78	78	65	78	71	59	78	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	74	81	75	67	81	69	62	76	64	55	70	59	45
			Exposed	81	81	81	81	81	81	81	81	81	81	81	77	81	81	73	81	77	69	81	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27			
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	86	92	84	78	92	77	71	90	71	66	84	66	58			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	92	85	92	86	80	92	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	91	97	95	83	95	87	76	92	81	71	85	75	66			
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	90	99	98	85	99	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	69	82	76	63	82	70	58	78	65	48	73	61	41			
			Exposed	82	82	82	82	82	82	82	82	81	82	82	76	82	82	72	82	82	68	82	78	65	82	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	82	73	85	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	85	85	85	85	85	84	85	85	79	85	83	74	85	78	69	85	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	91	84	95	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	95	95	95	95	95	95	95	95	92	95	92	86	95	87	80	95	82	76	95	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	99	102	102	90	100	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	102	102	102	102	102	102	102	102	97	102	102	91	102	98	85	102	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	67	72	72	62	72	69	56	72	65	47
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	74	66	75	74	66
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	72	64	75	66	59	72	61	49	67	54	40
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	83	76	86	83	76
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	82	86	80	74	86	74	68	86	68	63	80	63	53
		27-45	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	93	93	88	91	91	81	
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	87	94	91	79	94	84	73	87	77	68	81	72	63
	C	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	70	72	72	65	72	72	60	72	67	52
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	65	72	71	59	72	66	49	72	61	41	68	54	34	63	46	31
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	67	75	69	62	75	64	55	70	59	45
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	75	69	75	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	78	86	77	71	86	71	66	84	66	58			
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	86	86	80	86	78	72	86	71	65	82	65	55	75	59	47	70	50	39	65	42	33			
		27-45	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	91	92	92	83	90	87	76	88	81	71	85	75	66						
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	90	94	94	85	94	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42			
	D	0-7	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	75	63	75	70	58	75	65	48	73	61	41			
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	68	75	75	65	75	70	59	75	64	47	71	59	38	66	51	33	61	43	29	56	36	26	
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	74	66	78	67	60	73	62	51	68	56	41	64	46	35
			Exposed	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	73	65	78	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23	
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	84	90	82	76	90	75	69	88	69	64	81	64	54	75	60	47
			Exposed	90	90	90	90	90	90	90	90	90	90	90	86	90	87	80	90	82	76	90	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	90	95	93	81	92	85	74	89	78	69	81	73	63	75	68	59
			Exposed	97	97	97	97	97	97	97	97	97	97	97	91	97	97	85	97	92	81	97	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
70	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	56	67	65	47
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	69	66	59	69	61	49	67	54	40
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	74	81	74	68	81	68	63	80	63	53
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	88	88	88	87	87	81	
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	89	89	79	89	84	73	87	77	68	81	72	63			
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	60	67	67	52			
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	59	67	66	49	67	61	41	67	54	34	63	46	31
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	62	69	64	55	69	59	45
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	62	69	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	78	81	77	71	81	71	66	81	66	58						
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	78	72	81	71	65	81	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	87	83	85	85	76	84	81	71	82	75	66
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	85	89	88	77	89	80	70	82	73	64	75	68	59	69	63	50	64	58	42			
	D	0-7	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	69	70	70	63	70	70	58	70	65	48	70	61	41			
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	70	65	70	70	59	70	64	47	70	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	66	73	67	60	73	62	51	68	56	41	64	46	35
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	69	73	73	65	73	69	62	73	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	82	76	85	75	69	85	69	64	81	64	54	75	60	47
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	85	82	76	85	77	71	85	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	90	90	81	88	85	74	86	78	69	81	73	63	75	68	59
			Exposed	92	92	92	92	92	92	92	92	92	92	92	91	92	92	85	92	92	81	92	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	47
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	59	65	61	49	65	54	40
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	76	74	68	76	68	63	76	63	53			
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	84	84	83	83	81			
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	84	73	84	77	68	81	72	63			
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	47
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	63	53	65	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	71	65	76	65	55	75	59	47	70	50	39	65	42	33
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	71	76	66	58			
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	83	83	82	82	76	80	80	71	79	75	66
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	77	85	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	63	66	66	58	66	65	48	66	61	41
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	66	66	59	66	64	47	66	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	67	60	68	62	51	68	56	41	64	46	35
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	68	62	68	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23		
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	75	69	79	69	64	79	64	54	75	60	47
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	77	71	79	70	64	79	63	53	73	57	44	68	46	36	64	38	30	60	33	26		
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	86	81	84	84	74	82	78	69	80	73	63	75	68	59
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	88	81	88	88	76	88	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	56	59	59	47		
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	61	49	61	54	40			
		20-27	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	68	72	68	63	72	63	53		
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	80	73	80	77	68	80	72	63
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	52
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	49	59	59	41	59	54	34	59	46	31
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	55	61	59	45
			Exposed	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	53	61	57	42	61	46	35	59	38	30	53	33	27
		20-27	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	72	71	66	72	66	58
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	65	72	65	55	72	59	47	70	50	39	65	42	33
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78	78	76	77	77	71	76	75	66
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	80	70	80	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	62	48	62	61	41
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	62	47	62	59	38	62	51	33	61	43	29	56	36	26
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	62	51	65	56	41	64	46	35
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	62	51	65	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	69	64	75	64	54	75	60	47
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	70	64	75	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	81	81	81	74	79	78	69	77	73	63	75	68	59
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	76	84	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
100	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	47
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	54	40
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	63	68	63	53
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	76	68	76	72	63
	C	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	52
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	49	56	56	41	56	54	34	56	46	31
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	45
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	57	42	58	46	35	58	38	30	53	33	27			
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	66	58
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	65	55	68	59	47	68	50	39	65	42	33			
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	70	76	73	64	75	68	59	69	63	50	64	58	42
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	70	76	73	64	75	68	59	69	63	50	64	58	42			
	D	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	58	59	59	48	59	59	41
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	47	59	59	38	59	51	33	59	43	29	56	36	26
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	51	61	56	41	61	46	35
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	43	33	57	35	29	49	31	26	43	27	23			
		20-27	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	69	64	72	64	54	72	60	47
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	72	72	71	72	70	64	72	63	53	72	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	78	78	74	76	76	69	75	73	63	73	68	59
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	80	79	69	79	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	96	97	97	90	97	95	80	97	86	73	97	79	66	89	72	60	82	67	50	76	62	42
			Exposed	97	97	97	97	97	94	97	97	87	97	97	82	97	91	77	97	85	72	97	81	68	89	73	61	81	66	49	74	61	39	68	52	33	63	44	28	58	37	23
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	93	97	93	82	97	83	74	97	75	66	87	68	52	78	58	42	72	48	35
			Exposed	97	97	97	97	97	97	97	97	90	97	95	84	97	88	78	97	82	73	97	77	69	87	69	53	77	56	41	70	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	88	98	83	80	95	76	73	87	70	62	81	64	50			
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	93	98	92	87	98	86	82	96	76	73	86	69	60	78	60	46	72	48	37	66	39	31	61	34	27
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	89	99	93	81	99	85	74	94	78	68	87	72	62
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	94	99	99	88	99	96	83	99	85	74	93	77	67	84	70	58	77	64	47	70	55	39	58	46	33
	C	0-7	Interior	97	97	97	97	97	97	97	97	92	97	97	86	97	95	80	97	89	75	97	84	71	94	76	64	85	69	54	77	63	44	71	57	36	66	48	31	61	41	26
			Exposed	97	95	80	97	88	74	97	82	69	95	77	65	89	72	61	84	68	53	79	65	46	71	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	97	97	97	97	97	97	97	97	95	97	97	88	97	93	82	97	87	77	97	81	72	93	72	60	82	63	46	73	50	37	64	40	32	55	34	27	48	30	22
			Exposed	97	92	82	97	85	75	97	79	70	95	73	63	87	69	53	81	62	45	76	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	98	92	98	98	90	86	98	80	77	91	72	68	82	66	52	75	54	41	69	44	34	64	37	29
			Exposed	98	98	98	98	95	90	98	88	84	98	82	78	96	76	73	90	72	67	85	67	57	76	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	92	99	99	87	99	89	78	98	81	70	88	73	64	81	67	53	74	61	43	66	51	36
			Exposed	99	99	98	99	99	91	99	97	84	99	91	79	99	85	74	97	80	70	91	76	66	81	68	54	73	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	97	97	95	97	97	88	97	96	81	97	90	76	97	85	72	97	80	67	93	76	64	83	68	52	76	62	42	69	54	34	64	45	29	59	38	24	50	32	20
			Exposed	97	84	71	97	79	66	90	74	62	85	69	54	80	65	47	75	62	41	71	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	97	97	97	97	97	90	97	94	83	97	87	78	97	82	72	97	76	68	92	72	59	80	61	45	71	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	97	81	72	97	75	66	89	70	55	82	63	46	76	54	40	71	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	97	93	98	91	87	98	85	81	98	80	77	89	71	66	81	64	50	73	50	39	67	41	32	62	34	27	55	30	23
			Exposed	98	90	86	98	83	80	97	78	74	91	72	68	85	68	57	80	62	48	75	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	93	99	99	87	99	94	82	99	89	77	96	80	69	87	72	62	78	66	50	71	57	40	59	47	34	48	39	29
			Exposed	99	99	87	99	93	81	99	86	75	98	81	70	91	76	66	86	71	61	81	67	53	72	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
10	B	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	73	82	79	66	82	72	60	82	67	50	76	62	42			
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	82	72	82	81	68	82	73	61	81	66	49	74	61	39	68	52	33	63	44	28	58	37	23
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	74	82	75	66	82	68	52	78	58	42	72	48	35			
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	78	82	82	73	82	77	69	82	69	53	77	56	41	70	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	92	88	94	83	80	94	76	73	87	70	62	81	64	50
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	93	94	92	87	94	86	82	94	76	73	86	69	60	78	60	46	72	48	37	66	39	31	61	34	27
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	89	97	93	81	97	85	74	94	78	68	87	72	62
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	94	97	97	88	97	96	83	97	85	74	93	77	67	84	70	58	77	64	47	70	55	39	58	46	33
	C	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	75	82	82	71	82	76	64	82	69	54	77	63	44	71	57	36	66	48	31	61	41	26
			Exposed	82	82	80	82	82	74	82	82	69	82	77	65	82	72	61	82	68	53	79	65	46	71	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	81	72	82	72	60	82	63	46	73	50	37	64	40	32	55	34	27	48	30	22
			Exposed	82	82	82	82	82	75	82	79	70	82	73	63	82	69	53	81	62	45	76	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	92	94	90	86	94	80	77	91	72	68	82	66	52	75	54	41	69	44	34	64	37	29
			Exposed	94	94	94	94	94	90	94	88	84	94	82	78	94	76	73	90	72	67	85	67	57	76	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	92	97	97	87	97	89	78	97	81	70	88	73	64	81	67	53	74	61	43	66	51	36
			Exposed	97	97	97	97	97	91	97	97	84	97	91	79	97	85	74	97	80	70	91	76	66	81	68	54	73	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	82	82	82	82	82	82	82	81	82	82	76	82	82	72	82	80	67	82	76	64	82	68	52	76	62	42	69	54	34	64	45	29	59	38	24	50	32	20	
			Exposed	82	82	71	82	79	66	82	74	62	82	69	54	80	65	47	75	62	41	71	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	78	82	82	72	82	76	68	82	72	59	80	61	45	71	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	82	81	72	82	75	66	82	70	55	82	63	46	76	54	40	71	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	93	95	91	87	95	85	81	95	80	77	89	71	66	81	64	50	73	50	39	67	41	32	62	34	27	55	30	23
			Exposed	95	90	86	95	83	80	95	78	74	91	72	68	85	68	57	80	62	48	75	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	93	98	98	87	98	94	82	98	89	77	96	80	69	87	72	62	78	66	50	71	57	40	59	47	34	48	39	29
			Exposed	98	98	87	98	93	81	98	86	75	98	81	70	91	76	66	86	71	61	81	67	53	72	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
20	B	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	68	60	68	67	50	68	62	42
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	66	49	68	61	39	68	52	33	63	44	28	58	37	23
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	68	52	68	58	42	68	48	35
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	53	68	56	41	68	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	76	73	83	70	62	81	64	50
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	83	76	73	83	69	60	78	60	46	72	48	37	66	39	31	61	34	27
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	81	88	85	74	88	78	68	87	72	62
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	83	88	85	74	88	77	67	84	70	58	77	64	47	70	55	39	58	46	33
	C	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	68	54	68	63	44	68	57	36	66	48	31	61	41	26
			Exposed	68	68	68	68	68	68	68	68	68	68	68	65	68	68	61	68	68	53	68	65	46	68	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	63	46	68	50	37	64	40	32	55	34	27	48	30	22
			Exposed	68	68	68	68	68	68	68	68	68	68	68	63	68	68	53	68	62	45	68	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	72	68	82	66	52	75	54	41	69	44	34	64	37	29
			Exposed	83	83	83	83	83	83	83	83	83	83	82	78	83	76	73	83	72	67	83	67	57	76	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	88	78	88	81	70	88	73	64	81	67	53	74	61	43	66	51	36
			Exposed	88	88	88	88	88	88	88	88	84	88	88	79	88	85	74	88	80	70	88	76	66	81	68	54	73	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	68	68	64	68	68	52	68	62	42	68	54	34	64	45	29	59	38	24	50	32	20
			Exposed	68	68	68	68	68	66	68	68	62	68	68	54	68	65	47	68	62	41	68	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	61	45	68	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	68	68	68	68	68	66	68	68	55	68	63	46	68	54	40	68	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	80	77	85	71	66	81	64	50	73	50	39	67	41	32	62	34	27	55	30	23
			Exposed	85	85	85	85	83	80	85	78	74	85	72	68	85	68	57	80	62	48	75	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	89	89	82	89	89	77	89	80	69	87	72	62	78	66	50	71	57	40	59	47	34	48	39	29
			Exposed	89	89	87	89	89	81	89	86	75	89	81	70	89	76	66	86	71	61	81	67	53	72	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	67	60	67	67	50	67	62	42
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	66	49	67	61	39	67	52	33	63	44	28	58	37	23
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	68	52	68	58	42	68	48	35
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	53	68	56	41	68	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	70	62	75	64	50
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	69	60	75	60	46	72	48	37	66	39	31	61	34	27
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	74	80	78	68	80	72	62
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	74	80	77	67	80	70	58	77	64	47	70	55	39	58	46	33
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	64	67	67	54	67	63	44	67	57	36	66	48	31	61	41	26
			Exposed	67	67	67	67	67	67	67	67	67	67	65	67	67	61	67	67	53	67	65	46	67	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	63	46	68	50	37	64	40	32	55	34	27	48	30	22
			Exposed	68	68	68	68	68	68	68	68	68	68	68	63	68	68	53	68	62	45	68	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	68	75	66	52	75	54	41	69	44	34	64	37	29
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	72	67	75	67	57	75	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78	80	80	70	80	73	64	80	67	53	74	61	43	66	51	36
			Exposed	80	80	80	80	80	80	80	80	80	79	80	80	74	80	80	70	80	76	66	80	68	54	73	60	42	61	48	34	48	39	29	39	34	25	33	29	21		
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	68	68	64	68	68	52	68	62	42	68	54	34	64	45	29	59	38	24	50	32	20
			Exposed	68	68	68	68	68	66	68	68	62	68	68	54	68	65	47	68	62	41	68	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	61	45	68	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	68	68	68	68	68	66	68	68	55	68	63	46	68	54	40	68	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	71	66	78	64	50	73	50	39	67	41	32	62	34	27	55	30	23
			Exposed	78	78	78	78	78	78	78	78	74	78	72	68	78	68	57	78	62	48	75	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	80	69	82	72	62	78	66	50	71	57	40	59	47	34	48	39	29
			Exposed	82	82	82	82	82	81	82	82	75	82	81	70	82	76	66	82	71	61	81	67	53	72	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
40	B	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	50	61	61	42
			Exposed	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	49	61	61	39	61	52	33	61	44	28	58	37	23
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	52	63	58	42	63	48	35
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	56	41	63	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	62	70	64	50
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	69	60	70	60	46	70	48	37	66	39	31	61	34	27
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	68	75	72	62
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	67	75	70	58	75	64	47	70	55	39	58	46	33
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	61	54	61	61	44	61	57	36	61	48	31	61	41	26
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	46	61	58	37	61	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	60	63	63	46	63	50	37	63	40	32	55	34	27	48	30	22
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	62	45	63	53	39	63	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	66	52	70	54	41	69	44	34	64	37	29			
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	67	70	67	57	70	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	75	70	75	73	64	74	67	53	72	61	43	66	51	36
			Exposed	75	75	75	75	75	75	75	75	75	75	75	74	75	75	70	75	75	66	75	68	54	73	60	42	61	48	34	48	39	29	39	34	25	33	29	21			
	D	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	52	63	62	42	63	54	34	63	45	29	59	38	24	50	32	20
			Exposed	63	63	63	63	63	63	63	63	62	63	63	54	63	63	47	63	62	41	63	58	36	63	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	61	45	65	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	65	65	65	65	65	65	65	65	55	65	63	46	65	54	40	65	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	66	72	64	50	72	50	39	67	41	32	62	34	27	55	30	23
			Exposed	72	72	72	72	72	72	72	72	72	72	72	68	72	68	57	72	62	48	72	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	72	62	75	66	50	71	57	40	59	47	34	48	39	29
			Exposed	77	77	77	77	77	77	77	77	75	77	77	70	77	76	66	77	71	61	77	67	53	72	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
50	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	52	33	55	44	28	55	37	23
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	52	57	57	42	57	48	35
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	56	41	57	44	34	57	36	30	51	31	24	44	27	20
		20-27	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	64	50
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	60	46	65	48	37	65	39	31	61	34	27
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	70	62
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	67	70	70	58	70	64	47	70	55	39	58	46	33			
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	44	55	55	36	55	48	31	55	41	26			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	46	55	55	37	55	47	30	55	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	46	57	57	46	57	50	37	57	40	32	55	34	27	48	30	22
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	45	57	53	39	57	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	52	65	65	52	65	65	41	65	44	34	64	37	29			
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	57	65	55	42	65	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	64	69	67	53	67	61	43	66	51	36
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	66	70	68	54	70	60	42	61	48	34	48	39	29	39	34	25	33	29	21			
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	42	58	54	34	58	45	29	58	38	24	50	32	20			
			Exposed	58	58	58	58	58	58	58	58	58	58	58	54	58	58	47	58	58	41	58	58	36	58	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	60	60	45	60	47	35	60	37	30	52	32	25	45	28	20	35	23	17
			Exposed	60	60	60	60	60	60	60	60	55	60	60	46	60	54	40	60	46	35	60	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	64	50	67	50	39	67	41	32	62	34	27	55	30	23
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	57	67	67	62	48	67	54	42	67	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	62	71	66	50	69	57	40	59	47	34	48	39	29
			Exposed	72	72	72	72	72	72	72	72	72	72	72	70	72	72	66	72	71	61	72	67	53	72	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	42
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	39	51	51	33	51	44	28	51	37	23
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	42	53	48	35
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	41	53	44	34	53	36	30	51	31	24	44	27	20
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	50	61	61	50
			Exposed	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	60	61	60	46	61	48	37	61	39	31	61	34	27
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	62	66	66	62
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	58	66	64	47	66	55	39	58	46	33
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	36	51	48	31	51	41	26
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	37	51	47	30	51	38	24	50	32	20
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	50	37	53	40	32	53	34	27	48	30	22
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	45	53	53	39	53	41	32	53	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	54	41	61	44	34	61	37	29
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	57	61	55	42	61	43	33	61	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	64	65	65	53	64	61	43	62	51	36
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	54	66	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	42	53	53	34	53	45	29	53	38	24	50	32	20
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	47	53	53	41	53	53	36	53	46	29	53	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	47	35	55	37	30	52	32	25	45	28	20	35	23	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	46	55	54	40	55	46	35	55	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	50	63	50	39	63	41	32	62	34	27	55	30	23
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	57	63	62	48	63	54	42	63	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	68	62	67	66	50	65	57	40	59	47	34	48	39	29
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	66	69	69	61	69	67	53	69	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
70	B	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	39	47	47	33	47	44	28	47	37	23
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	42	49	48	35
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	41	49	44	34	49	36	30	49	31	24	44	27	20
		20-27	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	50	57	57	50
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	46	57	48	37	57	39	31	57	34	27
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	63	63	62
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	47	63	55	39	58	46	33
	C	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	36	47	47	31	47	41	26
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	47	47	37	47	47	30	47	38	24	47	32	20
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	37	49	40	32	49	34	27	48	30	22
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	45	49	49	39	49	41	32	49	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	52	57	54	41	57	44	34	57	37	29
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	55	42	57	43	33	57	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	62	53	61	61	43	59	51	36
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	54	63	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	42	49	49	34	49	45	29	49	38	24	49	32	20
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	49	36	49	46	29	49	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	45	51	47	35	51	37	30	51	32	25	45	28	20	35	23	17
			Exposed	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	46	35	51	40	32	51	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	50	60	50	39	60	41	32	60	34	27	55	30	23
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	57	60	60	48	60	54	42	60	41	32	60	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	64	64	50	62	57	40	59	47	34	48	39	29
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	53	65	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
80	B	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	39	44	44	33	44	44	28	44	37	23
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	35
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	34	46	36	30	46	31	24	44	27	20
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	50
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	48	37	53	39	31	53	34	27
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	58	60	60	47	60	55	39	58	46	33
	C	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	39	44	44	33	44	44	28	44	37	23
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	35
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	41	32	46	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	41	53	44	34	53	37	29
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	42	53	43	33	53	35	28	53	30	23	46	25	19	38	21	16
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	59	53	58	58	43	57	51	36
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	54	60	60	42	60	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	34	46	45	29	46	38	24	46	32	20
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	36	46	46	29	46	37	23	46	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	45	48	47	35	48	37	30	48	32	25	45	28	20	35	23	17
			Exposed	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	46	35	48	40	32	48	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	56	50	39	56	41	32	56	34	27	55	30	23
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	42	56	56	34	56	41	32	56	34	26	53	29	22
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	50	60	57	40	58	47	34
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	53	62	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	33	42	42	28
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	35
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	34	43	36	30	43	31	24
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	48	37	50	39	31
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	39
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	36	42	42	31
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	30
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	40	32
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	41	32	43	33	26	43	28	21	35	23	17	30	19	15
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	41	50	44	34
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	50	43	33	50	35	28	50	30	23	46	25	19
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	43
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	42	55	48	34	48	39	29	39	34	25
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	34	44	44	29	44	38	24
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	36	44	44	29	44	37	23	44	30	19	39	25	16	33	21	14
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	35	46	37	30	46	32	25	45	28	20
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	40	32	46	32	26	44	27	20	33	21	16	29	17	14	25	15	13
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	50	39	53	41	32	53	34	27
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	53	42	53	41	32	53	34	26	53	29	22	42	23	18	35	19	15
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	59	59	58	58	50	57	57	40	56	47	34
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	53	60	58	41	58	46	33	45	37	28	36	32	23	31	27	19
100	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	39	28
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	34	41	36	30	41	31	24
		20-27	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
			Exposed	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	46	48	48	37	48	39	31
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	39
	C	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	31
			Exposed	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	30	39	38	24	39	32	20	39	27	17
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	37	41	40	32	41	34	27
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	41	41	32	41	33	26	41	28	21	35	23	17	30	19	15
		20-27	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	41	48	44	34
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	43	33	48	35	28	48	30	23	46	25	19
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	50	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	34	42	42	29	42	38	24
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	36	42	42	29	42	37	23	42	30	19	39	25	16	33	21	14
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	35	43	37	30	43	32	25	43	28	20
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	40	32	43	32	26	43	27	20	33	21	16	29	17	14	25	15	13
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	39	50	41	32	50	34	27
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	42	50	41	32	50	34	26	50	29	22	42	23	18	35	19	15
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	40	54	47	34
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	46	33	45	37	28	36	32	23	31	27	19

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	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	48	48	48	48	46	48	48	37	48	39	31	48	34	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	50	50	50	50	50	50	50	50	50
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39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	39	28	39	37	23
41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	35
41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	34	41	36	30	41	31	24	41	27	20
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50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	39	50	46	33
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39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	24	39	32	20	39	27	17	35	23	15
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41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	41	41	32	41	33	26	41	28	21	35	23	17	30	19	15	26	16	13
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48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	43	33	48	35	28	48	30	23	46	25	19	38	21	16
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42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	34	42	42	29	42	38	24	42	32	20
42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	30	42	38	24	42	32	20
43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	40	32	43	34	27	43	30	22
43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
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55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
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UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	133	136	136	123	136	136	116	136	125	104	136	113	94	127	103	86	116	95	79	107	88	73	99	82	68
			Exposed	136	136	133	136	136	121	136	136	112	136	127	105	136	118	99	136	112	93	132	106	88	117	95	80	106	87	73	97	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	122	136	134	115	136	115	102	136	104	92	136	94	84	112	86	77	100	79	71	91	73	65
			Exposed	136	136	136	136	136	120	136	128	111	136	117	104	136	109	97	136	103	91	136	97	86	113	87	77	99	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	132	122	137	116	109	137	105	98	122	96	89	112	88	82	104	82	76
			Exposed	137	137	137	137	137	137	137	137	137	137	135	124	137	122	115	137	115	108	137	108	101	123	97	90	111	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	126	138	133	113	138	118	103	130	108	94	116	100	87	107	93	81
			Exposed	138	138	138	138	138	138	138	138	138	138	128	138	138	138	119	138	131	112	138	121	106	132	109	95	114	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	136	136	136	136	136	128	136	136	118	136	134	110	136	124	103	136	117	98	136	110	92	122	100	83	111	91	76	101	83	69	93	77	64	86	71	59	80	67	51
			Exposed	136	124	103	136	115	96	135	108	90	124	101	84	116	95	79	110	90	75	104	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	136	136	136	136	136	129	136	136	117	136	123	109	136	115	102	136	108	96	136	101	90	121	91	81	105	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	136	115	102	136	106	94	136	99	88	136	92	82	113	86	77	104	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	131	121	137	120	113	137	113	106	131	101	95	116	92	85	106	83	77	97	77	71	90	71	65	83	66	57
			Exposed	137	131	121	137	118	111	137	110	103	133	103	96	122	96	90	115	91	84	109	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	125	138	138	117	138	129	110	138	114	99	120	103	90	109	94	82	99	87	76	91	80	70	84	75	65
			Exposed	138	138	125	138	137	115	138	124	107	138	116	101	131	109	95	119	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	136	136	121	136	136	113	136	127	105	136	118	98	136	111	93	130	105	87	121	99	83	109	90	75	99	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	136	111	92	127	103	86	118	97	81	111	91	76	104	86	71	98	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	136	136	121	136	128	111	136	117	103	136	109	97	136	102	90	136	96	85	120	90	80	103	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	136	102	90	136	94	84	115	88	78	105	82	73	97	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	137	137	137	137	137	137	137	135	124	137	122	114	137	114	107	137	107	100	130	101	94	114	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	137	113	106	137	105	98	125	98	91	116	92	85	109	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	138	138	138	138	138	138	138	138	128	138	138	118	138	130	111	138	120	104	138	113	99	119	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	138	129	111	138	118	103	136	110	96	121	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
10	B	0-7	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	104	114	113	94	114	103	86	114	95	79	107	88	73	99	82	68
			Exposed	114	114	114	114	114	114	114	114	112	114	114	105	114	114	99	114	112	93	114	106	88	114	95	80	106	87	73	97	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	102	115	104	92	115	94	84	112	86	77	100	79	71	91	73	65
			Exposed	115	115	115	115	115	115	115	115	111	115	115	104	115	109	97	115	103	91	115	97	86	113	87	77	99	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	122	131	116	109	131	105	98	122	96	89	112	88	82	104	82	76
			Exposed	131	131	131	131	131	131	131	131	131	131	131	124	131	122	115	131	115	108	131	108	101	123	97	90	111	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	126	136	133	113	136	118	103	130	108	94	116	100	87	107	93	81
			Exposed	136	136	136	136	136	136	136	136	136	136	136	128	136	136	119	136	131	112	136	121	106	132	109	95	114	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	114	114	114	114	114	114	114	114	114	114	114	110	114	114	103	114	114	98	114	110	92	114	100	83	111	91	76	101	83	69	93	77	64	86	71	59	80	67	51
			Exposed	114	114	103	114	114	96	114	108	90	114	101	84	114	95	79	110	90	75	104	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	115	115	115	115	115	115	115	115	115	115	115	109	115	115	102	115	108	96	115	101	90	115	91	81	105	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	115	115	102	115	106	94	115	99	88	115	92	82	113	86	77	104	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	121	131	120	113	131	113	106	131	101	95	116	92	85	106	83	77	97	77	71	90	71	65	83	66	57
			Exposed	131	131	121	131	118	111	131	110	103	131	103	96	122	96	90	115	91	84	109	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	125	136	136	117	136	129	110	136	114	99	120	103	90	109	94	82	99	87	76	91	80	70	84	75	65
			Exposed	136	136	125	136	136	115	136	124	107	136	116	101	131	109	95	119	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	114	114	114	114	114	113	114	114	105	114	114	98	114	111	93	114	105	87	114	99	83	109	90	75	99	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	114	111	92	114	103	86	114	97	81	111	91	76	104	86	71	98	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	115	115	115	115	115	111	115	115	103	115	109	97	115	102	90	115	96	85	115	90	80	103	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	115	102	90	115	94	84	115	88	78	105	82	73	97	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	133	133	133	133	133	133	133	133	124	133	122	114	133	114	107	133	107	100	130	101	94	114	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	133	113	106	133	105	98	125	98	91	116	92	85	109	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	137	137	137	137	137	137	137	137	128	137	137	118	137	130	111	137	120	104	137	113	99	119	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	137	129	111	137	118	103	136	110	96	121	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
20	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	94	95	95	86	95	95	79	95	88	73	95	82	68			
			Exposed	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	88	95	95	80	95	87	73	95	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	92	96	94	84	96	86	77	96	79	71	91	73	65			
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	91	96	96	86	96	87	77	96	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	109	116	105	98	116	96	89	112	88	82	104	82	76			
			Exposed	116	116	116	116	116	116	116	116	116	116	116	116	116	116	115	116	115	108	116	108	101	116	97	90	111	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	113	123	118	103	123	108	94	116	100	87	107	93	81			
			Exposed	123	123	123	123	123	123	123	123	123	123	123	123	123	123	119	123	123	112	123	121	106	123	109	95	114	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	92	95	95	83	95	91	76	95	83	69	93	77	64	86	71	59	80	67	51
			Exposed	95	95	95	95	95	95	95	95	90	95	95	84	95	95	79	95	90	75	95	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	91	81	96	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	96	96	96	96	96	94	96	96	88	96	92	82	96	86	77	96	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	113	116	113	106	116	101	95	116	92	85	106	83	77	97	77	71	90	71	65	83	66	57
			Exposed	116	116	116	116	116	111	116	110	103	116	103	96	116	96	90	115	91	84	109	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	117	123	123	110	123	114	99	120	103	90	109	94	82	99	87	76	91	80	70	84	75	65
			Exposed	123	123	123	123	123	115	123	123	107	123	116	101	123	109	95	119	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	87	95	95	83	95	90	75	95	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	95	95	92	95	95	86	95	95	81	95	91	76	95	86	71	95	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	96	85	96	90	80	96	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	96	96	90	96	94	84	96	88	78	96	82	73	96	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	119	119	119	119	119	119	119	119	119	119	119	114	119	114	107	119	107	100	119	101	94	114	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	119	113	106	119	105	98	119	98	91	116	92	85	109	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	125	125	125	125	125	125	125	125	125	125	125	118	125	125	111	125	120	104	125	113	99	119	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	125	125	111	125	118	103	125	110	96	121	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	86	94	94	79	94	88	73	94	82	68
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	93	94	94	88	94	94	80	94	87	73	94	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	92	96	94	84	96	86	77	96	79	71	91	73	65
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	91	96	96	86	96	87	77	96	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	98	106	96	89	106	88	82	104	82	76
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	101	106	97	90	106	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	103	113	108	94	113	100	87	107	93	81
			Exposed	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	112	113	113	106	113	109	95	113	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	92	94	94	83	94	91	76	94	83	69	93	77	64	86	71	59	80	67	51
			Exposed	94	94	94	94	94	94	94	94	90	94	94	84	94	94	79	94	90	75	94	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	91	81	96	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	96	96	96	96	96	94	96	96	88	96	92	82	96	86	77	96	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	101	95	106	92	85	106	83	77	97	77	71	90	71	65	83	66	57
			Exposed	106	106	106	106	106	106	106	106	103	106	103	96	106	96	90	106	91	84	106	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	110	113	113	99	113	103	90	109	94	82	99	87	76	91	80	70	84	75	65
			Exposed	113	113	113	113	113	113	113	113	107	113	113	101	113	109	95	113	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	87	95	95	83	95	90	75	95	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	95	95	92	95	95	86	95	95	81	95	91	76	95	86	71	95	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	96	85	96	90	80	96	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	96	96	90	96	94	84	96	88	78	96	82	73	96	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	107	108	107	100	108	101	94	108	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	108	108	106	108	105	98	108	98	91	108	92	85	108	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	111	115	115	104	115	113	99	115	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	115	115	111	115	115	103	115	110	96	115	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
40	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	85	73	85	82	68
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	85	73	85	80	67	85	74	61	83	69	55	77	64	46
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	86	77	88	79	71	88	73	65	88	73	65	88	73	65
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	87	77	88	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	96	89	97	88	82	97	82	76
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	90	97	87	81	97	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	103	105	105	94	105	100	87	102	93	81
			Exposed	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	95	105	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	76	85	83	69	85	77	64	85	71	59	80	67	51
			Exposed	85	85	85	85	85	85	85	85	85	85	85	84	85	85	79	85	85	75	85	85	71	85	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	81	88	82	73	88	75	67	83	69	61	76	63	54	69	59	44
			Exposed	88	88	88	88	88	88	88	88	88	88	88	82	88	86	77	88	81	72	88	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	95	97	92	85	97	83	77	97	77	71	90	71	65	83	66	57
			Exposed	97	97	97	97	97	97	97	97	97	97	97	96	97	96	90	97	91	84	97	86	79	97	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	99	105	103	90	103	94	82	99	87	76	91	80	70	84	75	65
			Exposed	105	105	105	105	105	105	105	105	101	105	105	101	105	105	95	105	102	89	105	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	88	83	88	88	75	88	82	68	88	75	62	84	69	57	78	64	47	72	60	40
			Exposed	88	88	88	88	88	86	88	88	81	88	88	76	88	86	71	88	81	68	88	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	91	91	85	91	90	80	91	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	91	91	90	91	91	84	91	88	78	91	82	73	91	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	94	100	90	84	100	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	100	100	100	100	100	98	100	98	91	100	92	85	100	86	80	100	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	104	108	108	99	108	102	89	105	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	108	108	108	108	108	103	108	108	96	108	103	90	108	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
50	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	67	77	74	61	77	69	55	77	64	46
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	79	71	80	73	65
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	78	70	80	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	89	91	88	82	91	82	76
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	91	87	81	91	80	74	91	73	68	86	68	61	80	63	52
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	94	98	98	87	96	93	81
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	95	98	98	86	98	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	69	77	77	64	77	71	59	77	67	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	71	77	77	64	77	71	59	77	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	73	80	75	67	80	69	61	76	63	54	69	59	44
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	80	72	80	77	68	80	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	85	91	83	77	91	77	71	90	71	65	83	66	57	83	66	57
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	84	91	86	79	91	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	90	96	94	82	94	87	76	91	80	70	84	75	65	84	75	65
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	95	98	98	89	98	97	84	98	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	75	81	81	68	81	75	62	81	69	57	78	64	47	72	60	40
			Exposed	81	81	81	81	81	81	81	81	81	81	81	76	81	81	71	81	81	68	81	77	64	81	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	80	84	81	72	84	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	84	84	84	84	84	84	84	84	78	84	82	73	84	77	69	84	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	90	84	94	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	94	94	94	94	94	94	94	94	91	94	92	85	94	86	80	94	81	75	94	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	99	101	101	89	99	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	101	101	101	101	101	101	101	101	96	101	101	90	101	97	85	101	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	61	71	69	55	71	64	46
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	73	65
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	70	74	71	64	74	66	58	72	61	48	67	53	39
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	82	76
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	80	74	85	73	68	85	68	61	80	63	52
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	92	92	87	91	91	81
			Exposed	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	86	93	90	79	93	83	72	87	77	67	80	71	62
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	64	71	71	59	71	67	51
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	64	71	71	59	71	65	48	71	60	40	67	53	34
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	67	74	69	61	74	63	54	69	59	44
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	69	62	74	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	77	85	77	71	85	71	65	83	66	57
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	85	79	85	77	71	85	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	90	91	91	82	89	87	76	87	80	70	84	75	65			
			Exposed	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	89	93	93	84	93	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41			
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	74	62	74	69	57	74	64	47	72	60	40			
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	68	74	74	64	74	70	58	74	64	46	71	59	38	65	49	32	61	42	28	54	36	25			
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	72	78	73	65	78	67	60	73	61	49	67	54	40	63	45	34
			Exposed	78	78	78	78	78	78	78	78	78	78	73	78	77	69	78	73	65	78	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22			
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	82	76	88	75	69	87	69	63	80	63	53	75	59	46
			Exposed	88	88	88	88	88	88	88	88	88	88	88	85	88	86	80	88	81	75	88	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	89	94	92	81	91	85	74	88	78	68	81	72	63	75	67	58
			Exposed	96	96	96	96	96	96	96	96	96	96	96	90	96	96	85	96	92	80	96	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
70	B	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	66	55	66	64	46
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	65
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	69	69	64	69	66	58	69	61	48	67	53	39
		20-27	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	74	80	73	68	80	68	61	80	63	52
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	87	87	86	86	81
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	88	79	88	83	72	87	77	67	80	71	62
	C	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	64	66	66	59	66	66	51			
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	59	66	65	48	66	60	40	66	53	34	63	45	30
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	61	69	63	54	69	59	44
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	62	69	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	77	71	80	71	65	80	66	57
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	77	71	80	70	64	80	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	87	76	88	79	69	82	73	63	75	67	58	69	62	49
			Exposed	88	88	88	88	88	88	88	88	88	88	88	85	88	88	80	88	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32			
	D	0-7	Interior	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	62	69	69	57	69	64	47	69	60	40			
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	64	69	69	58	69	64	46	69	59	38	65	49	32	61	42	28	54	36	25			
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	65	72	67	60	72	61	49	67	54	40	63	45	34
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	65	72	69	61	72	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22			
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	76	84	75	69	84	69	63	80	63	53	75	59	46
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	80	84	81	75	84	77	71	84	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	89	89	89	81	87	85	74	85	78	68	81	72	63	75	67	58
			Exposed	91	91	91	91	91	91	91	91	91	91	91	90	91	91	85	91	91	80	91	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	55	62	62	46
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	58	64	61	48	64	53	39
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	73	68	75	68	61	75	63	52			
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	81	
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	79	84	83	72	83	77	67	80	71	62			
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	62	51
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	70	64	75	64	54	75	59	46	69	49	38
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	76	84	79	69	82	73	63	75	67	58	69	62	49
	D	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	57	65	64	47	65	60	40
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	58	65	64	46	65	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	67	60	68	61	49	67	54	40	63	45	34
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	68	61	68	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22			
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	75	69	79	69	63	79	63	53	75	59	46
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	79	77	71	79	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25	
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	85	85	81	83	83	74	81	78	68	79	72	63	75	67	58
			Exposed	87	87	87	87	87	87	87	87	87	87	87	87	87	87	85	87	87	80	87	87	76	87	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	46
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	58	61	61	48	61	53	39		
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	68	61	71	63	52		
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	72	79	77	67	79	71	62		
	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	51
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	48	58	58	40	58	53	34	58	45	30
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	59	44
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	56	41	61	45	34	59	37	30	52	32	26
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	65	71	66	57
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	64	71	64	54	71	59	46	69	49	38	65	41	32
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	78	76	76	76	70	75	75	65
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	79	69	79	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	57	61	61	47	61	60	40
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	58	61	61	46	61	59	38	61	49	32	61	42	28	54	36	25
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	61	49	64	54	40	63	45	34
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	61	64	62	50	64	53	39	62	42	32	56	34	28	48	30	25
		20-27	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	69	63	74	63	53	74	59	46
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	69	64	74	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	80	74	78	78	68	77	72	63	75	67	58
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	83	76	83	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
100	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	46
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	48	58	53	39
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	63	52
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	76	67	76	71	62
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	40	55	53	34	55	45	30
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	44
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	56	41	58	45	34	58	37	30	52	32	26
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	66	57
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	64	67	64	54	67	59	46	67	49	38	65	41	32			
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	75	75	73	73	70	72	72	65
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	69	76	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	57	58	58	47	58	58	40
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	46	58	58	38	58	49	32	58	42	28	54	36	25
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	49	61	54	40	61	45	34
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	50	61	53	39	61	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	69	63	71	63	53	71	59	46
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	64	71	63	52	71	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	77	74	76	76	68	74	72	63	72	67	58
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	78	68	79	71	62	73	65	55	67	60	45	61	52	37	55	44	32

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	84	71	85	78	65	85	72	60	81	67	50
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	77	85	85	73	85	78	66	85	71	58	79	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	79	71	85	72	63	83	67	51	78	57	42
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	77	85	82	73	85	73	64	82	66	49	76	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	81	76	85	74	70	85	69	60
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	77	85	73	69	84	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	83	72	85	77	67
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	82	72	85	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	85	76	85	82	69	85	74	62	83	68	52	76	63	43	71	58	37	66	49	31
			Exposed	85	85	85	85	85	79	85	85	74	85	83	70	85	78	65	85	74	62	85	70	56	77	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	85	76	85	77	68	85	69	55	79	59	44	73	48	38	66	40	33	57	36	27
			Exposed	85	85	85	85	85	80	85	83	74	85	78	69	85	73	63	85	68	54	81	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	77	73	85	70	63	80	64	50	74	53	41	69	44	35
			Exposed	85	85	85	85	85	85	85	85	85	85	85	82	85	81	77	85	76	72	85	72	68	81	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	75	85	78	68	85	72	63	78	66	52	71	61	44			
			Exposed	85	85	85	85	85	85	85	85	85	85	85	84	85	85	79	85	85	74	85	81	70	85	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	85	85	85	85	85	85	85	85	85	85	81	85	85	77	85	85	72	85	81	68	85	73	62	81	67	50	74	61	41	68	54	35	63	45	29	59	38	24	
			Exposed	85	85	76	85	84	71	85	79	66	85	74	62	85	70	56	81	66	49	76	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	82	85	85	77	85	81	72	85	76	68	84	68	54	77	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	85	85	76	85	80	71	85	74	66	85	69	56	81	64	47	77	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	76	72	85	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	85	85	85	85	85	84	85	82	78	85	77	73	85	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	74	85	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	85	85	85	85	85	85	85	85	80	85	85	75	85	81	70	85	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
10	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	84	71	85	78	65	85	72	60	81	67	50
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	77	85	85	73	85	78	66	85	71	58	79	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	79	71	85	72	63	83	67	51	78	57	42
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	77	85	82	73	85	73	64	82	66	49	76	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	81	76	85	74	70	85	69	60
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	77	85	73	69	84	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	83	72	85	77	67
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	82	72	85	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	85	76	85	82	69	85	74	62	83	68	52	76	63	43	71	58	37	66	49	31
			Exposed	85	85	85	85	85	79	85	85	74	85	83	70	85	78	65	85	74	62	85	70	56	77	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	85	76	85	77	68	85	69	55	79	59	44	73	48	38	66	40	33	57	36	27
			Exposed	85	85	85	85	85	80	85	83	74	85	78	69	85	73	63	85	68	54	81	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	77	73	85	70	63	80	64	50	74	53	41	69	44	35
			Exposed	85	85	85	85	85	85	85	85	85	85	85	82	85	81	77	85	76	72	85	72	68	81	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	75	85	78	68	85	72	63	78	66	52	71	61	44			
			Exposed	85	85	85	85	85	85	85	85	85	85	85	84	85	85	79	85	85	74	85	81	70	85	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	85	85	85	85	85	85	85	85	85	85	81	85	85	77	85	85	72	85	81	68	85	73	62	81	67	50	74	61	41	68	54	35	63	45	29	59	38	24	
			Exposed	85	85	76	85	84	71	85	79	66	85	74	62	85	70	56	81	66	49	76	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	82	85	85	77	85	81	72	85	76	68	84	68	54	77	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	85	85	76	85	80	71	85	74	66	85	69	56	81	64	47	77	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	76	72	85	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	85	85	85	85	85	84	85	82	78	85	77	73	85	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	74	85	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	85	85	85	85	85	85	85	85	80	85	85	75	85	81	70	85	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
20	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	65	74	72	60	74	67	50			
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	66	74	71	58	74	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	72	63	75	67	51	75	57	42
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	73	64	75	66	49	75	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	81	76	85	74	70	85	69	60
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	77	85	73	69	84	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	83	72	85	77	67
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	82	72	85	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	74	62	74	68	52	74	63	43	71	58	37	66	49	31
			Exposed	74	74	74	74	74	74	74	74	74	74	74	70	74	74	65	74	74	62	74	70	56	74	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	69	55	75	59	44	73	48	38	66	40	33	57	36	27
			Exposed	75	75	75	75	75	75	75	75	74	75	75	69	75	73	63	75	68	54	75	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	77	73	85	70	63	80	64	50	74	53	41	69	44	35
			Exposed	85	85	85	85	85	85	85	85	85	85	85	82	85	81	77	85	76	72	85	72	68	81	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	75	85	78	68	85	72	63	78	66	52	71	61	44			
			Exposed	85	85	85	85	85	85	85	85	85	85	85	84	85	85	79	85	85	74	85	81	70	85	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	73	62	74	67	50	74	61	41	68	54	35	63	45	29	59	38	24
			Exposed	74	74	74	74	74	71	74	74	66	74	74	62	74	70	56	74	66	49	74	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	68	75	68	54	75	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	75	75	75	75	75	71	75	74	66	75	69	56	75	64	47	75	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	76	72	85	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	85	85	85	85	85	84	85	82	78	85	77	73	85	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	74	85	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	85	85	85	85	85	85	85	85	80	85	85	75	85	81	70	85	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	65	73	72	60	73	67	50
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	66	73	71	58	73	65	47	73	60	40	68	52	33	63	44	28
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	72	63	75	67	51	75	57	42
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	73	64	75	66	49	75	53	40	70	43	35	61	38	29	53	32	24
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	76	83	74	70	83	69	60
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	77	83	73	69	83	67	55	77	57	44	71	47	37	66	40	32
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	83	72	85	77	67
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	82	72	85	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	69	73	73	62	73	68	52	73	63	43	71	58	37	66	49	31
			Exposed	73	73	73	73	73	73	73	73	73	73	70	73	73	65	73	73	62	73	70	56	73	63	44	70	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	69	55	75	59	44	73	48	38	66	40	33	57	36	27
			Exposed	75	75	75	75	75	75	75	75	74	75	75	69	75	73	63	75	68	54	75	64	47	74	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	81	83	77	73	83	70	63	80	64	50	74	53	41	69	44	35
			Exposed	83	83	83	83	83	83	83	83	83	83	83	82	83	81	77	83	76	72	83	72	68	81	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	75	85	78	68	85	72	63	78	66	52	71	61	44			
			Exposed	85	85	85	85	85	85	85	85	85	84	85	85	79	85	85	74	85	81	70	85	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25		
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	73	62	74	67	50	74	61	41	68	54	35	63	45	29	59	38	24		
			Exposed	74	74	74	74	74	71	74	74	66	74	74	62	74	70	56	74	66	49	74	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	68	75	68	54	75	56	42	72	45	36	62	38	30	54	33	24	42	27	20
			Exposed	75	75	75	75	75	71	75	74	66	75	69	56	75	64	47	75	55	41	73	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	76	72	85	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	85	85	85	85	85	84	85	82	78	85	77	73	85	72	68	85	68	58	80	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	85	74	85	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	85	85	85	85	85	85	85	85	80	85	85	75	85	81	70	85	76	66	85	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
40	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	60	67	67	50
			Exposed	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	58	67	65	47	67	60	40	67	52	33	63	44	28
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	63	69	67	51	69	57	42
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	69	66	49	69	53	40	69	43	35	61	38	29	53	32	24
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	70	76	69	60
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	69	76	67	55	76	57	44	71	47	37	66	40	32
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	72	82	77	67
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	72	82	75	65	81	69	57	74	64	47	68	55	40
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	52	67	63	43	67	58	37	66	49	31
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	62	67	67	56	67	63	44	67	56	36	64	46	29	59	38	24	50	32	20	42	27	18
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	55	69	59	44	69	48	38	66	40	33	57	36	27
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	63	69	68	54	69	64	47	69	49	38	65	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	70	63	76	64	50	74	53	41	69	44	35
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	72	68	76	64	50	73	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	75	82	78	68	80	72	63	78	66	52	71	61	44
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	74	82	81	70	82	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25		
	D	0-7	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	62	69	67	50	69	61	41	68	54	35	63	45	29	59	38	24		
			Exposed	69	69	69	69	69	69	69	69	66	69	69	62	69	69	56	69	66	49	69	63	43	69	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	68	54	71	56	42	71	45	36	62	38	30	54	33	24	42	27	20
			Exposed	71	71	71	71	71	71	71	71	66	71	69	56	71	64	47	71	55	41	71	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	72	78	68	59	78	60	46	72	49	38	66	41	32	62	36	28
			Exposed	78	78	78	78	78	78	78	78	78	77	73	78	72	68	78	68	58	78	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	84	84	74	84	77	67	82	70	59	75	64	48	69	56	41	58	47	35
			Exposed	84	84	84	84	84	84	84	84	80	84	84	75	84	81	70	84	76	66	84	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19
50	B	0-7	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	50	60	60	50
			Exposed	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	58	60	60	47	60	60	40	60	52	33	60	44	28
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	51	63	57	42
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	49	63	53	40	63	43	35	61	38	29	53	32	24
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	69	60
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	67	55	71	57	44	71	47	37	66	40	32
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	72	76	76	67
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	72	77	75	65	77	69	57	74	64	47	68	55	40
	C	0-7	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	52	60	60	43	60	58	37	60	49	31
			Exposed	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	46	59	38	24	50	32	20	42	27	18
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	55	63	59	44	63	48	38
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	54	63	63	47	63	49	38	63	40	32	54	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	63	71	64	50	71	53	41
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	64	50	71	51	40	67	41	33	62	36	28	55	30	23	46	25	19
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	68	75	72	63	73	66	52	71	61	44			
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	74	77	77	70	77	72	63	77	66	51	69	57	41	57	47	35	46	40	29	40	35	25		
	D	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	63	63	50	63	61	41	63	54	35	63	45	29	59	38	24
			Exposed	63	63	63	63	63	63	63	63	63	63	63	62	63	63	56	63	63	49	63	63	43	63	55	35	63	44	28	56	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	54	66	56	42	66	45	36	62	38	30	54	33	24	42	27	20
			Exposed	66	66	66	66	66	66	66	66	66	66	66	56	66	64	47	66	55	41	66	48	38	63	39	31	52	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	73	68	59	73	60	46	72	49	38	66	41	32	62	36	28
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	72	68	73	68	58	73	64	50	72	49	39	66	40	32	60	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	74	79	77	67	77	70	59	75	64	48	69	56	41	58	47	35
			Exposed	79	79	79	79	79	79	79	79	79	79	79	75	79	79	70	79	76	66	79	72	63	76	65	49	68	55	40	54	44	33	43	38	27	38	32	23	33	27	19

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	33	46	44	28		
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42		
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	40	47	43	35	47	38	29	47	32	24
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	47	37	55	40	32		
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	62	47	62	55	40		
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	37	46	46	31		
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	36	46	46	29	46	38	24	46	32	20	42	27	18
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	38	47	40	33	47	36	27
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	38	47	40	32	47	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	41	55	44	35		
			Exposed	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	51	40	55	41	33	55	36	28	55	30	23	46	25	19
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	61	60	60	52	59	59	44
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	51	62	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	41	48	48	35	48	45	29	48	38	24
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	35	48	44	28	48	36	23	47	30	19	39	25	17	33	22	15
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	50	45	36	50	38	30	50	33	24	42	27	20
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	41	50	48	38	50	39	31	50	32	24	40	26	20	34	21	17	29	18	15	26	16	13
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	46	58	49	38	58	41	32	58	36	28
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	50	58	49	39	58	40	32	58	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	63	59	62	62	48	61	56	41	58	47	35
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	49	65	55	40	54	44	33	43	38	27	38	32	23	33	27	19
100	B	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	33	43	43	28
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42		
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	43	35	45	38	29	45	32	24
		20-27	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	44	52	47	37	52	40	32
		27-45	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	57	59	59	47	59	55	40
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	31
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	29	43	38	24	43	32	20	42	27	18
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	38	45	40	33	45	36	27
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	38	45	40	32	45	34	25	42	27	20	36	22	18	31	19	16
		20-27	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	41	52	44	35
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	50	52	51	40	52	41	33	52	36	28	52	30	23	46	25	19
		27-45	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	58	58	52	57	57	44
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	51	59	57	41	57	47	35	46	40	29	40	35	25
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	45	29	46	38	24
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	35	46	44	28	46	36	23	46	30	19	39	25	17	33	22	15
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42	47	45	36	47	38	30	47	33	24	42	27	20
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	41	47	47	38	47	39	31	47	32	24	40	26	20	34	21	17	29	18	15	26	16	13			
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	46	55	49	38	55	41	32	55	36	28
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	49	39	55	40	32	55	34	26	51	28	21	42	23	18	36	20	15
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	60	60	48	59	56	41	58	47	35
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	55	40	54	44	33	43	38	27	38	32	23	33	27	19

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	136	138	138	125	138	138	116	138	127	105	138	114	95	129	104	87	117	96	80	108	89	74	100	83	69
			Exposed	138	138	135	138	138	122	138	138	113	138	129	106	138	119	100	138	113	94	134	107	89	118	96	80	107	88	73	98	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	125	138	137	115	138	116	103	138	104	93	138	95	84	112	87	77	101	80	71	91	74	66
			Exposed	138	138	138	138	138	121	138	131	112	138	118	104	138	110	98	138	103	92	138	97	87	113	87	78	99	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	135	124	139	117	109	139	106	99	124	97	90	113	89	83	105	83	76
			Exposed	139	139	139	139	139	139	139	139	139	139	138	128	139	125	116	139	116	108	139	109	102	125	97	91	112	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	128	140	135	114	140	119	103	134	109	95	117	101	88	107	93	81
			Exposed	140	140	140	140	140	140	140	140	140	140	140	131	140	140	120	140	134	113	140	123	106	136	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	138	138	138	138	138	130	138	138	119	138	137	111	138	126	104	138	118	98	138	111	93	124	101	84	111	92	76	102	84	70	94	78	65	87	72	60	81	67	52
			Exposed	138	126	104	138	116	97	137	109	91	126	102	85	117	96	80	111	91	76	105	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	138	138	138	138	138	132	138	138	118	138	126	110	138	116	103	138	109	96	138	102	91	127	91	81	105	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	138	115	102	138	107	95	138	99	88	138	93	83	113	87	77	104	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	134	123	139	122	114	139	114	107	133	102	95	117	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	139	134	123	139	119	112	139	111	104	136	104	97	124	97	90	116	92	85	109	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	128	140	140	118	140	132	111	140	115	100	122	104	91	109	95	83	100	87	76	92	81	71	85	75	66
			Exposed	140	140	127	140	140	116	140	126	108	140	117	101	135	110	95	120	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	138	138	123	138	138	113	138	129	106	138	119	99	138	112	93	132	106	88	123	100	83	110	90	75	100	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	138	112	93	129	104	87	119	97	81	112	92	76	105	86	72	99	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	138	138	123	138	131	112	138	118	104	138	110	97	138	103	91	138	96	86	121	91	81	103	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	138	102	91	138	95	84	115	88	79	105	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	115	115	139	108	101	132	101	95	115	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	139	114	107	139	106	99	127	99	92	117	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	140	140	140	140	140	140	140	140	131	140	140	119	140	132	112	140	122	105	140	114	99	119	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	140	132	111	140	119	104	140	111	97	122	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
10	B	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	105	115	114	95	115	104	87	115	96	80	108	89	74	100	83	69
			Exposed	115	115	115	115	115	115	115	115	113	115	115	106	115	115	100	115	113	94	115	107	89	115	96	80	107	88	73	98	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	115	116	116	103	116	104	93	116	95	84	112	87	77	101	80	71	91	74	66
			Exposed	116	116	116	116	116	116	116	116	112	116	116	104	116	110	98	116	103	92	116	97	87	113	87	78	99	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	124	133	117	109	133	106	99	124	97	90	113	89	83	105	83	76
			Exposed	133	133	133	133	133	133	133	133	133	133	133	128	133	125	116	133	116	108	133	109	102	125	97	91	112	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	128	138	135	114	138	119	103	134	109	95	117	101	88	107	93	81
			Exposed	138	138	138	138	138	138	138	138	138	138	138	131	138	138	120	138	134	113	138	123	106	136	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	111	115	115	104	115	115	98	115	111	93	115	101	84	111	92	76	102	84	70	94	78	65	87	72	60	81	67	52
			Exposed	115	115	104	115	115	97	115	109	91	115	102	85	115	96	80	111	91	76	105	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	110	116	116	103	116	109	96	116	102	91	116	91	81	105	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	116	115	102	116	107	95	116	99	88	116	93	83	113	87	77	104	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	133	133	133	133	133	133	133	133	133	133	133	133	133	133	123	133	122	114	133	114	107	133	102	95	117	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	133	133	123	133	119	112	133	111	104	133	104	97	124	97	90	116	92	85	109	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	131	138	138	120	138	134	113	138	123	106	136	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
			Exposed	138	138	127	138	138	116	138	126	108	138	117	101	135	110	95	120	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	115	115	115	115	115	113	115	115	106	115	115	99	115	112	93	115	106	88	115	100	83	110	90	75	100	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	115	112	93	115	104	87	115	97	81	112	92	76	105	86	72	99	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	116	116	116	116	116	112	116	116	104	116	110	97	116	103	91	116	96	86	116	91	81	103	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	116	102	91	116	95	84	115	88	79	105	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	134	134	134	134	134	134	134	134	127	134	124	115	134	115	107	134	108	101	132	101	95	115	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	134	114	107	134	106	99	127	99	92	117	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	139	139	139	139	139	139	139	139	131	139	139	119	139	132	112	139	122	105	139	114	99	119	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	139	132	111	139	119	104	139	111	97	122	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
20	B	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	96	96	87	96	96	80	96	89	74	96	83	69	96	83	69
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	94	96	96	89	96	96	80	96	88	73	96	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	93	97	95	84	97	87	77	97	80	71	91	74	66	91	74	66
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	92	97	97	87	97	87	78	97	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	109	118	106	99	118	97	90	113	89	83	105	83	76	105	83	76
			Exposed	118	118	118	118	118	118	118	118	118	118	118	118	118	118	116	118	116	108	118	109	102	118	97	91	112	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	114	124	119	103	124	109	95	117	101	88	107	93	81	107	93	81
			Exposed	124	124	124	124	124	124	124	124	124	124	124	124	124	124	120	124	124	113	124	123	106	124	110	96	115	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	96	84	96	92	76	96	84	70	94	78	65	87	72	60	81	67	52
			Exposed	96	96	96	96	96	96	96	96	91	96	96	85	96	96	80	96	91	76	96	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	96	97	97	91	97	91	81	97	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	97	97	97	97	97	95	97	97	88	97	93	83	97	87	77	97	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	114	118	114	107	118	102	95	117	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	118	118	118	118	118	112	118	111	104	118	104	97	118	97	90	116	92	85	109	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	118	124	124	111	124	115	100	122	104	91	109	95	83	100	87	76	92	81	71	85	75	66
			Exposed	124	124	124	124	124	116	124	124	108	124	117	101	124	110	95	120	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	96	88	96	96	83	96	90	75	96	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	96	96	93	96	96	87	96	96	81	96	92	76	96	86	72	96	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	91	97	96	86	97	91	81	97	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	97	97	91	97	95	84	97	88	79	97	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	120	120	120	120	120	120	120	120	120	120	120	115	120	115	107	120	108	101	120	101	95	115	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	120	114	107	120	106	99	120	99	92	117	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	126	126	126	126	126	126	126	126	126	126	126	119	126	126	112	126	122	105	126	114	99	119	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	126	126	111	126	119	104	126	111	97	122	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	87	95	95	80	95	89	74	95	83	69
			Exposed	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	94	95	95	89	95	95	80	95	88	73	95	81	67	90	74	62	83	69	56	78	65	47
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	95	84	97	87	77	97	80	71	91	74	66
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	92	97	97	87	97	87	78	97	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	99	107	97	90	107	89	83	105	83	76
			Exposed	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	102	107	97	91	107	88	82	102	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	103	114	109	95	114	101	88	107	93	81
			Exposed	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	113	114	114	106	114	110	96	114	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	84	95	92	76	95	84	70	94	78	65	87	72	60	81	67	52
			Exposed	95	95	95	95	95	95	95	95	91	95	95	85	95	95	80	95	91	76	95	86	72	95	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	96	97	97	91	97	91	81	97	83	74	93	75	67	84	69	62	76	64	55	70	59	45
			Exposed	97	97	97	97	97	95	97	97	88	97	93	83	97	87	77	97	82	73	97	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	102	95	107	92	86	106	84	78	98	77	71	90	71	66	84	66	58
			Exposed	107	107	107	107	107	107	107	107	104	107	104	97	107	97	90	107	92	85	107	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	111	114	114	100	114	104	91	109	95	83	100	87	76	92	81	71	85	75	66
			Exposed	114	114	114	114	114	114	114	114	108	114	114	101	114	110	95	114	103	90	113	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	96	88	96	96	83	96	90	75	96	82	69	92	76	63	85	70	58	78	65	48	73	61	41
			Exposed	96	96	93	96	96	87	96	96	81	96	92	76	96	86	72	96	82	68	94	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	91	97	96	86	97	91	81	97	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	97	97	91	97	95	84	97	88	79	97	83	74	97	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	110	110	110	110	110	110	110	110	110	110	110	110	110	110	107	110	108	101	110	101	95	110	91	84	104	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	110	110	107	110	106	99	110	99	92	110	92	86	110	87	80	103	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	117	117	117	117	117	117	117	117	117	117	117	117	117	117	112	117	117	105	117	114	99	117	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	117	117	111	117	117	104	117	111	97	117	104	91	113	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
40	B	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	86	80	86	86	74	86	83	69
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	86	73	86	81	67	86	74	62	83	69	56	78	65	47
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	84	89	87	77	89	80	71	89	74	66
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	89	87	78	89	79	70	88	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	90	98	89	83	98	83	76			
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	91	98	88	82	98	80	74	93	74	68	86	68	63	80	63	53
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	103	106	106	95	106	101	88	104	93	81
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	96	106	100	87	104	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	86	86	76	86	84	70	86	78	65	86	72	60	81	67	52
			Exposed	86	86	86	86	86	86	86	86	86	86	86	85	86	86	80	86	86	76	86	86	72	86	78	65	86	71	59	79	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	81	89	83	74	89	75	67	84	69	62	76	64	55	70	59	45
			Exposed	89	89	89	89	89	89	89	89	88	89	89	83	89	87	77	89	82	73	89	77	69	85	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	95	98	92	86	98	84	78	98	77	71	90	71	66	84	66	58
			Exposed	98	98	98	98	98	98	98	98	98	98	98	97	98	97	90	98	92	85	98	86	80	98	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	100	106	104	91	104	95	83	100	87	76	92	81	71	85	75	66
			Exposed	106	106	106	106	106	106	106	106	106	106	106	101	106	106	95	106	103	90	106	98	85	100	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	88	89	89	83	89	89	75	89	82	69	89	76	63	85	70	58	78	65	48	73	61	41
			Exposed	89	89	89	89	89	87	89	89	81	89	89	76	89	86	72	89	82	68	89	78	65	85	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	92	86	92	91	81	92	82	73	91	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	92	92	91	92	92	84	92	88	79	92	83	74	92	78	69	90	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	101	102	101	95	102	91	84	102	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	102	102	102	102	102	99	102	99	92	102	92	86	102	87	80	102	82	76	98	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	105	109	109	99	109	103	90	107	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	109	109	109	109	109	104	109	109	97	109	104	91	109	98	85	106	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
50	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	69
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	78	67	78	74	62	78	69	56	78	65	47
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	80	71	81	74	66
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	78	81	79	70	81	72	64	79	66	59	72	61	49	67	54	40
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	89	83	92	83	76
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	88	82	92	80	74	92	74	68	86	68	63	80	63	53
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	88	97	93	81
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	99	99	87	99	91	79	95	84	73	87	77	68	81	72	63
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	78	70	78	78	65	78	72	60	78	67	52
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	78	72	78	78	65	78	71	59	78	66	49	73	61	41	68	54	34	63	46	31
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	74	81	75	67	81	69	62	76	64	55	70	59	45
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	81	73	81	77	69	81	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	86	92	84	78	92	77	71	90	71	66	84	66	58			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	92	85	92	86	80	92	78	72	89	71	65	82	65	55	75	59	47	70	50	39	65	42	33
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	91	97	95	83	95	87	76	92	81	71	85	75	66			
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	90	99	98	85	99	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	69	82	76	63	82	70	58	78	65	48	73	61	41			
			Exposed	82	82	82	82	82	82	82	82	81	82	82	76	82	82	72	82	82	68	82	78	65	82	70	59	78	64	47	71	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	82	73	85	74	66	81	67	60	73	62	51	68	56	41	64	46	35
			Exposed	85	85	85	85	85	84	85	85	79	85	83	74	85	78	69	85	73	65	84	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	91	84	95	82	76	95	75	69	88	69	64	81	64	54	75	60	47
			Exposed	95	95	95	95	95	95	95	95	92	95	92	86	95	87	80	95	82	76	95	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	99	102	102	90	100	93	81	97	85	74	89	78	69	81	73	63	75	68	59
			Exposed	102	102	102	102	102	102	102	102	97	102	102	91	102	98	85	102	92	81	100	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	67	72	72	62	72	69	56	72	65	47
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	74	66	75	74	66
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	72	64	75	66	59	72	61	49	67	54	40
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	83	86	83	76	86	83	76
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	82	86	80	74	86	74	68	86	68	63	80	63	53
		27-45	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	93	93	88	91	91	81	
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	87	94	91	79	94	84	73	87	77	68	81	72	63
	C	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	70	72	72	65	72	72	60	72	67	52
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	65	72	71	59	72	66	49	72	61	41	68	54	34	63	46	31
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	75	67	75	69	62	75	64	55	70	59	45
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	73	75	75	69	75	70	62	75	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	78	86	77	71	86	71	66	84	66	58			
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	86	86	80	86	78	72	86	71	65	82	65	55	75	59	47	70	50	39	65	42	33			
		27-45	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	91	92	92	83	90	87	76	88	81	71	85	75	66						
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	90	94	94	85	94	88	77	90	80	70	82	73	64	75	68	59	69	63	50	64	58	42			
	D	0-7	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	75	63	75	70	58	75	65	48	73	61	41			
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	68	75	75	65	75	70	59	75	64	47	71	59	38	66	51	33	61	43	29	56	36	26	
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	74	66	78	67	60	73	62	51	68	56	41	64	46	35
			Exposed	78	78	78	78	78	78	78	78	78	78	74	78	78	69	78	73	65	78	69	62	74	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23	
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	84	90	82	76	90	75	69	88	69	64	81	64	54	75	60	47
			Exposed	90	90	90	90	90	90	90	90	90	90	90	86	90	87	80	90	82	76	90	77	71	88	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	90	95	93	81	92	85	74	89	78	69	81	73	63	75	68	59
			Exposed	97	97	97	97	97	97	97	97	97	97	97	91	97	97	85	97	92	81	97	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
70	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	56	67	65	47
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	69	66	59	69	61	49	67	54	40
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	74	81	74	68	81	68	63	80	63	53
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	88	88	88	87	87	81	
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	89	89	79	89	84	73	87	77	68	81	72	63			
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	60	67	67	52
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	59	67	66	49	67	61	41	67	54	34	63	46	31
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	62	69	64	55	69	59	45
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	62	69	63	53	68	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	78	81	78	72	81	71	65	81	65	55	75	59	47	70	50	39
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	78	72	81	71	65	81	65	55	75	59	47	70	50	39	65	42	33			
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	84	81	71	
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	85	89	88	77	89	80	70	82	73	64	75	68	59	69	63	50	64	58	42			
	D	0-7	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	69	70	70	63	70	70	58	70	65	48	70	61	41			
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	70	65	70	70	59	70	64	47	70	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	66	73	67	60	73	62	51	68	56	41	64	46	35
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	69	73	73	65	73	69	62	73	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23	
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	82	76	85	75	69	85	69	64	81	64	54	75	60	47
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	85	82	76	85	77	71	85	70	64	80	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	90	90	81	88	85	74	86	78	69	81	73	63	75	68	59
			Exposed	92	92	92	92	92	92	92	92	92	92	92	91	92	92	85	92	92	81	92	88	76	89	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	47
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	59	65	61	49	65	54	40
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	76	74	68	76	68	63	76	63	53			
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	84	84	83	83	81	
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	84	73	84	77	68	81	72	63			
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	52
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	62	49	62	61	41	62	54	34	62	46	31			
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	64	55	65	59	45			
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	63	53	65	57	42	64	46	35	59	38	30	53	33	27
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	71	76	66	58			
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	71	65	76	65	55	75	59	47	70	50	39	65	42	33			
		27-45	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	83	83	82	82	76	80	80	71	79	75	66
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	77	85	80	70	82	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	63	66	66	58	66	65	48	66	61	41
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	66	66	59	66	64	47	66	59	38	66	51	33	61	43	29	56	36	26
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	67	60	68	62	51	68	56	41	64	46	35
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	68	62	68	62	51	67	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	75	69	79	69	64	79	64	54	75	60	47
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	77	71	79	70	64	79	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	86	81	84	84	74	82	78	69	80	73	63	75	68	59
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	88	81	88	88	76	88	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	56	59	59	47	59	59	47
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	61	49	61	54	40	61	54	40
		20-27	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	68	72	68	63	72	63	53
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	80	73	80	77	68	80	72	63
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	52
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	49	59	59	41	59	54	34	59	46	31
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	55	61	59	45	61	59	45
			Exposed	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	53	61	57	42	61	46	35	59	38	30	53	33	27
		20-27	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	72	71	66	72	66	58
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	65	72	65	55	72	59	47	70	50	39	65	42	33
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78	80	78	78	76	77	77	71	76	75	66
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	80	70	80	73	64	75	68	59	69	63	50	64	58	42
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	58	62	62	48	62	61	41
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	59	62	62	47	62	59	38	62	51	33	61	43	29	56	36	26
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	62	51	65	56	41	64	46	35
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	62	51	65	54	40	62	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	69	64	75	64	54	75	60	47
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	70	64	75	63	53	73	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	81	81	81	74	79	78	69	77	73	63	75	68	59
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	76	84	79	69	80	72	63	73	66	56	67	61	46	62	54	38	56	45	33
100	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	47	56	56	47
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	54	40
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	63	68	63	53
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	73	76	76	68	76	72	63
	C	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	52
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	49	56	56	41	56	54	34	56	46	31
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	45	58	58	45
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	57	42	58	46	35	58	38	30	53	33	27
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	66	58
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	65	55	68	59	47	68	50	39	65	42	33
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	74	71	73	73	66	73	73	66
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	70	76	73	64	75	68	59	69	63	50	64	58	42	59	51	42
	D	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	58	59	59	48	59	59	41
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	47	59	59	38	59	51	33	59	43	29	56	36	26
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	51	61	56	41	61	46	35
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	61	40	61	43	33	57	35	29	49	31	26	43	27	23
		20-27	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	69	64	72	64	54	72	60	47
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	72	70	64	72	63	53	72	57	44	68	46	36	64	38	30	60	33	26
		27-45	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	79	79	78	78	74	76	76	69	75	73	63	73	68	59
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76	80	79	69	79	72	63	73	66	56	67	61	46	62	54	38	56	45	33

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	60	71	67	50	71	62	42
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	61	71	66	49	71	61	39	68	52	33	63	44	28	58	37	23
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	68	52	71	58	42	71	48	35
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	69	53	71	56	41	70	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	62	71	64	50
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	60	71	60	46	71	48	37	66	39	31	61	34	27
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	62
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	58	71	64	47	70	55	39	58	46	33			
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	64	71	69	54	71	63	44	71	57	36	66	48	31	61	41	26
			Exposed	71	71	71	71	71	71	71	71	69	71	71	65	71	71	61	71	68	53	71	65	46	71	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	60	71	63	46	71	50	37	64	40	32	55	34	27	48	30	22
			Exposed	71	71	71	71	71	71	71	71	70	71	71	63	71	69	53	71	62	45	71	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	66	52	71	54	41	69	44	34	64	37	29			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	67	57	71	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	64	71	67	53	71	61	43	66	51	36			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	68	54	71	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	64	71	68	52	71	62	42	69	54	34	64	45	29	59	38	24	50	32	20
			Exposed	71	71	71	71	71	66	71	71	62	71	69	54	71	65	47	71	62	41	71	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	59	71	61	45	71	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	71	71	71	71	71	66	71	70	55	71	63	46	71	54	40	71	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	66	71	64	50	71	50	39	67	41	32	62	34	27	55	30	23			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	68	71	68	57	71	62	48	71	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	62	71	66	50	71	57	40	59	47	34	48	39	29
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	71	61	71	67	53	71	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
10	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	60	71	67	50	71	62	42
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	61	71	66	49	71	61	39	68	52	33	63	44	28	58	37	23
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	68	52	71	58	42	71	48	35
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	69	53	71	56	41	70	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	62	71	64	50
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	60	71	60	46	71	48	37	66	39	31	61	34	27
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	62
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	58	71	64	47	70	55	39	58	46	33			
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	64	71	69	54	71	63	44	71	57	36	66	48	31	61	41	26
			Exposed	71	71	71	71	71	71	71	71	69	71	71	65	71	71	61	71	68	53	71	65	46	71	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	60	71	63	46	71	50	37	64	40	32	55	34	27	48	30	22
			Exposed	71	71	71	71	71	71	71	71	70	71	71	63	71	69	53	71	62	45	71	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	66	52	71	54	41	69	44	34	64	37	29			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	67	57	71	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	64	71	67	53	71	61	43	66	51	36			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	68	54	71	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	64	71	68	52	71	62	42	69	54	34	64	45	29	59	38	24	50	32	20
			Exposed	71	71	71	71	71	66	71	71	62	71	69	54	71	65	47	71	62	41	71	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	59	71	61	45	71	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	71	71	71	71	71	66	71	70	55	71	63	46	71	54	40	71	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	66	71	64	50	71	50	39	67	41	32	62	34	27	55	30	23			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	68	71	68	57	71	62	48	71	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	62	71	66	50	71	57	40	59	47	34	48	39	29
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	71	61	71	67	53	71	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
20	B	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	68	60	68	67	50	68	62	42
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	66	49	68	61	39	68	52	33	63	44	28	58	37	23
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	68	52	68	58	42	68	48	35
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	53	68	56	41	68	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	62	71	64	50
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	60	71	60	46	71	48	37	66	39	31	61	34	27
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	62
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	58	71	64	47	70	55	39	58	46	33			
	C	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	64	68	68	54	68	63	44	68	57	36	66	48	31	61	41	26
			Exposed	68	68	68	68	68	68	68	68	68	68	68	65	68	68	61	68	68	53	68	65	46	68	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	63	46	68	50	37	64	40	32	55	34	27	48	30	22
			Exposed	68	68	68	68	68	68	68	68	68	68	68	63	68	68	53	68	62	45	68	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	66	52	71	54	41	69	44	34	64	37	29			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	67	57	71	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	64	71	67	53	71	61	43	66	51	36			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	68	54	71	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	68	68	64	68	68	52	68	62	42	68	54	34	64	45	29	59	38	24	50	32	20
			Exposed	68	68	68	68	68	66	68	68	62	68	68	54	68	65	47	68	62	41	68	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	61	45	68	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	68	68	68	68	68	66	68	68	55	68	63	46	68	54	40	68	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	71	66	71	64	50	71	50	39	67	41	32	62	34	27	55	30	23			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	68	71	68	57	71	62	48	71	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	62	71	66	50	71	57	40	59	47	34	48	39	29
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	71	61	71	67	53	71	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	67	60	67	67	50	67	62	42
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	66	49	67	61	39	67	52	33	63	44	28	58	37	23
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66	68	68	52	68	58	42	68	48	35
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	53	68	56	41	68	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	62	71	64	50
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	60	71	60	46	71	48	37	66	39	31	61	34	27
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	62
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	70	58	71	64	47	70	55	39	58	46	33
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	64	67	67	54	67	63	44	67	57	36	66	48	31	61	41	26
			Exposed	67	67	67	67	67	67	67	67	67	67	65	67	67	61	67	67	53	67	65	46	67	58	37	65	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	63	46	68	50	37	64	40	32	55	34	27	48	30	22
			Exposed	68	68	68	68	68	68	68	68	68	68	68	63	68	68	53	68	62	45	68	53	39	65	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	54	71	66	41	69	44	34	64	37	29			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	67	57	71	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	64	71	67	53	71	61	43	66	51	36			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	68	54	71	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	67	68	68	64	68	68	52	68	62	42	68	54	34	64	45	29	59	38	24	50	32	20
			Exposed	68	68	68	68	68	66	68	68	62	68	68	54	68	65	47	68	62	41	68	58	36	64	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	61	45	68	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	68	68	68	68	68	66	68	68	55	68	63	46	68	54	40	68	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	64	50	71	50	39	67	41	32	62	34	27	55	30	23
			Exposed	71	71	71	71	71	71	71	71	71	71	68	71	68	57	71	62	48	71	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	62	71	66	50	71	57	40	59	47	34	48	39	29
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	71	61	71	67	53	71	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
40	B	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	50	61	61	42
			Exposed	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	49	61	61	39	61	52	33	61	44	28	58	37	23
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	52	63	58	42	63	48	35
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	56	41	63	44	34	59	36	30	51	31	24	44	27	20
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	62	70	64	50
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	69	60	70	60	46	70	48	37	66	39	31	61	34	27
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	71	62
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	70	58	71	64	47	70	55	39	58	46	33
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	61	44	61	57	36	61	48	31	61	41	26
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	46	61	58	37	61	47	30	59	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	60	63	63	46	63	50	37	63	40	32	55	34	27	48	30	22
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	62	45	63	53	39	63	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	70	54	70	66	41	69	44	34	64	37	29			
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	67	70	67	57	70	55	42	69	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	64	71	67	53	71	61	43	66	51	36			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	68	54	71	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	42	63	54	34	63	45	29	59	38	24	50	32	20
			Exposed	63	63	63	63	63	63	63	63	62	63	63	54	63	63	47	63	62	41	63	58	36	63	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	61	45	65	47	35	61	37	30	52	32	25	45	28	20	35	23	17
			Exposed	65	65	65	65	65	65	65	65	55	65	63	46	65	54	40	65	46	35	64	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	66	71	64	50	71	50	39	67	41	32	62	34	27	55	30	23
			Exposed	71	71	71	71	71	71	71	71	71	71	68	71	68	57	71	62	48	71	54	42	68	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	62	71	66	50	71	57	40	59	47	34	48	39	29
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	71	61	71	67	53	71	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
50	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	52	33	55	44	28	55	37	23
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	52	57	57	42	57	48	35
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	56	41	57	44	34	57	36	30	51	31	24	44	27	20
		20-27	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	64	50
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	60	46	65	48	37	65	39	31	61	34	27
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	70	62
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	67	70	70	58	70	64	47	70	55	39	58	46	33			
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	44	55	55	36	55	48	31	55	41	26
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	46	55	55	37	55	47	30	55	38	24	50	32	20	42	27	17	35	23	15
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	46	57	50	37	57	40	32	55	34	27	48	30	22
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	45	57	53	39	57	41	32	54	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	52	65	54	41	65	44	34	64	37	29
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	57	65	55	42	65	43	33	63	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	64	69	67	53	67	61	43	66	51	36
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	66	70	68	54	70	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	42	58	54	34	58	45	29	58	38	24	50	32	20
			Exposed	58	58	58	58	58	58	58	58	58	58	58	54	58	58	47	58	58	41	58	58	36	58	46	29	57	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	60	60	45	60	47	35	60	37	30	52	32	25	45	28	20	35	23	17
			Exposed	60	60	60	60	60	60	60	60	55	60	60	46	60	54	40	60	46	35	60	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	64	50	67	50	39	67	41	32	62	34	27	55	30	23
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	54	67	67	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	62	71	66	50	69	57	40	59	47	34	48	39	29
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	66	71	71	61	71	67	53	71	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	42
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	39	51	51	33	51	44	28	51	37	23
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	42	53	48	35
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	41	53	44	34	53	36	30	51	31	24	44	27	20
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	50	61	61	50
			Exposed	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	60	61	60	46	61	48	37	61	39	31	61	34	27
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	62	66	66	62
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	58	66	64	47
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	36	51	48	31	51	41	26
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	37	51	47	30	51	38	24
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	50	37	53	40	32	53	34	27
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	45	53	53	39	53	41	32	53	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	54	41	61	44	34	61	37	29
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	57	61	55	42	61	43	33	61	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	64	65	65	53	64	61	43	62	51	36
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	54	66	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	42	53	53	34	53	45	29	53	38	24	50	32	20
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	47	53	53	41	53	53	36	53	46	29	53	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	47	35	55	37	30	52	32	25	45	28	20	35	23	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	46	55	54	40	55	46	35	55	40	32	53	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	50	63	50	39	63	41	32	62	34	27	55	30	23
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	57	63	62	48	63	54	42	63	41	32	61	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	68	62	67	66	50	65	57	40	59	47	34	48	39	29
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	66	69	69	61	69	67	53	69	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
70	B	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42	47	47	42
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	39	47	47	33	47	44	28	47	37	23
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	42	49	48	35
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	41	49	44	34	49	36	30	49	31	24	44	27	20
		20-27	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	50	57	57	50
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	46	57	48	37	57	39	31	57	34	27
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	63	63	62
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	47	63	55	39	58	46	33
	C	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	36	47	47	31	47	41	26
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	37	47	47	30	47	38	24
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	37	49	40	32	49	34	27	48	30	22
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	45	49	49	39	49	41	32	49	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	52	57	54	41	57	44	34	57	37	29
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	55	42	57	43	33	57	35	28	55	30	23	46	25	19	38	21	16
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	62	53	61	61	43	59	51	36
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	54	63	60	42	61	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	42	49	49	34	49	45	29	49	38	24	49	32	20
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	49	36	49	46	29	49	37	23	47	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	45	51	47	35	51	37	30	51	32	25	45	28	20	35	23	17
			Exposed	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	46	35	51	40	32	51	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	50	60	50	39	60	41	32	60	34	27	55	30	23
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	57	60	60	48	60	54	42	60	41	32	60	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	64	64	50	62	57	40	59	47	34	48	39	29
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	53	65	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
80	B	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	42
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	39	44	44	33	44	44	28	44	37	23
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	35
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	44	34	46	36	30	46	31	24	44	27	20
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	50
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	48	37	53	39	31	53	34	27
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	58	60	60	47	60	55	39	58	46	33
	C	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	42
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	37	44	44	28
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	35
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	41	32	46	33	26	46	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	41	53	44	34	53	37	29
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	42	53	43	33	53	35	28	53	30	23	46	25	19	38	21	16
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	59	53	58	58	43	57	51	36
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	54	60	60	42	60	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	34	46	45	29	46	38	24	46	32	20
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	36	46	46	29	46	37	23	46	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	45	48	47	35	48	37	30	48	32	25	45	28	20	35	23	17
			Exposed	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	46	35	48	40	32	48	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	56	50	39	56	41	32	56	34	27	55	30	23
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	41	56	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	50	60	57	40	58	47	34	48	39	29
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	53	62	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	33	42	42	28	42	37	23
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	43	43	35
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	34	43	36	30	43	31	24	43	27	20
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	48	37	50	39	31	50	34	27
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	39	55	46	33
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	36	42	42	31	42	41	26
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	30	42	38	24
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	32	43	34	27
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	41	32	43	33	26	43	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	41	50	44	34	50	37	29
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	50	43	33	50	35	28	50	30	23	46	25	19	38	21	16
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	43	55	51	36
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	42	55	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	34	44	44	29	44	38	24	44	32	20
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	36	44	44	29	44	37	23	44	30	19	39	25	16	33	21	14	28	18	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	35	46	37	30	46	32	25	45	28	20	35	23	17
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	40	32	46	32	26	44	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	50	39	53	41	32	53	34	27	53	30	23
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	53	42	53	41	32	53	34	26	53	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	59	59	58	58	50	57	57	40	56	47	34	48	39	29
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	53	60	58	41	58	46	33	45	37	28	36	32	23	31	27	19	28	22	16
100	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	39	28	39	37	23
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	35
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	34	41	36	30	41	31	24	41	27	20
		20-27	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
			Exposed	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	46	48	48	37	48	39	31	48	34	27
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	39	50	46	33
	C	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	31	39	39	26
			Exposed	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	30	39	38	24	39	32	20	39	27	17	35	23	15
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	37	41	40	32	41	34	27	41	30	22
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	41	41	32	41	33	26	41	28	21	35	23	17	30	19	15	26	16	13
		20-27	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	41	48	44	34	48	37	29
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	43	33	48	35	28	48	30	23	46	25	19	38	21	16
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43	50	50	36
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	42	50	50	50	50	48	34	48	39	29	39	34	25	33	29	21
	D	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	40	32	43	32	26	43	27	20	33	21	16	29	17	14	25	15	13	21	14	11
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	42	50	41	32	50	34	26	50	29	22	42	23	18	35	19	15	30	16	13
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	40	54	47	34	48	39	29
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	46	33	45	37	28	36	32	23	31	27	19	28	22	16

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	133	136	136	123	136	136	116	136	125	104	136	113	94	127	103	86	116	95	79	107	88	73	99	82	68
			Exposed	136	136	133	136	136	121	136	136	112	136	127	105	136	118	99	136	112	93	132	106	88	117	95	80	106	87	73	97	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	122	136	134	115	136	115	102	136	104	92	136	94	84	112	86	77	100	79	71	91	73	65
			Exposed	136	136	136	136	136	120	136	128	111	136	117	104	136	109	97	136	103	91	136	97	86	113	87	77	99	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	132	122	137	116	109	137	105	98	122	96	89	112	88	82	104	82	76
			Exposed	137	137	137	137	137	137	137	137	137	137	135	124	137	122	115	137	115	108	137	108	101	123	97	90	111	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	126	138	133	113	138	118	103	130	108	94	116	100	87	107	93	81
			Exposed	138	138	138	138	138	138	138	138	138	138	128	138	138	128	138	138	119	138	131	112	138	121	106	132	109	95	114	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	136	136	136	136	136	128	136	136	118	136	134	110	136	124	103	136	117	98	136	110	92	122	100	83	111	91	76	101	83	69	93	77	64	86	71	59	80	67	51
			Exposed	136	124	103	136	115	96	135	108	90	124	101	84	116	95	79	110	90	75	104	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	136	136	136	136	136	129	136	136	117	136	123	109	136	115	102	136	108	96	136	101	90	121	91	81	105	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	136	115	102	136	106	94	136	99	88	136	92	82	113	86	77	104	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	131	121	137	120	113	137	113	106	131	101	95	116	92	85	106	83	77	97	77	71	90	71	65	83	66	57
			Exposed	137	131	121	137	118	111	137	110	103	133	103	96	122	96	90	115	91	84	109	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	125	138	138	117	138	129	110	138	114	99	120	103	90	109	94	82	99	87	76	91	80	70	84	75	65
			Exposed	138	138	125	138	137	115	138	124	107	138	116	101	131	109	95	119	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	136	136	121	136	136	113	136	127	105	136	118	98	136	111	93	130	105	87	121	99	83	109	90	75	99	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	136	111	92	127	103	86	118	97	81	111	91	76	104	86	71	98	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	136	136	121	136	128	111	136	117	103	136	109	97	136	102	90	136	96	85	120	90	80	103	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	136	102	90	136	94	84	115	88	78	105	82	73	97	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	137	137	137	137	137	137	137	135	124	137	122	114	137	114	107	137	107	100	130	101	94	114	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	137	113	106	137	105	98	125	98	91	116	92	85	109	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	138	138	138	138	138	138	138	138	128	138	138	118	138	130	111	138	120	104	138	113	99	119	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	138	129	111	138	118	103	136	110	96	121	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
10	B	0-7	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	104	114	113	94	114	103	86	114	95	79	107	88	73	99	82	68
			Exposed	114	114	114	114	114	114	114	114	112	114	114	105	114	114	99	114	112	93	114	106	88	114	95	80	106	87	73	97	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	102	115	104	92	115	94	84	112	86	77	100	79	71	91	73	65
			Exposed	115	115	115	115	115	115	115	115	111	115	115	104	115	109	97	115	103	91	115	97	86	113	87	77	99	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	122	131	116	109	131	105	98	122	96	89	112	88	82	104	82	76
			Exposed	131	131	131	131	131	131	131	131	131	131	131	124	131	122	115	131	115	108	131	108	101	123	97	90	111	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	126	136	133	113	136	118	103	130	108	94	116	100	87	107	93	81
			Exposed	136	136	136	136	136	136	136	136	136	136	136	128	136	136	119	136	131	112	136	121	106	132	109	95	114	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	114	114	114	114	114	114	114	114	114	114	114	110	114	114	103	114	114	98	114	110	92	114	100	83	111	91	76	101	83	69	93	77	64	86	71	59	80	67	51
			Exposed	114	114	103	114	114	96	114	108	90	114	101	84	114	95	79	110	90	75	104	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	115	115	115	115	115	115	115	115	115	115	115	109	115	115	102	115	108	96	115	101	90	115	91	81	105	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	115	115	102	115	106	94	115	99	88	115	92	82	113	86	77	104	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	122	131	116	109	131	105	98	122	96	89	112	88	82	104	82	76
			Exposed	131	131	121	131	118	111	131	110	103	131	103	96	122	96	90	115	91	84	109	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	136	136	136	136	136	136	136	136	136	136	136	128	136	136	119	136	131	112	136	121	106	132	109	95	114	99	86	103	90	79	94	83	72	87	77	67	80	71	62
			Exposed	136	136	125	136	136	115	136	124	107	136	116	101	131	109	95	119	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	114	114	114	114	114	113	114	114	105	114	114	98	114	111	93	114	105	87	114	99	83	109	90	75	99	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	114	111	92	114	103	86	114	97	81	111	91	76	104	86	71	98	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	115	115	115	115	115	111	115	115	103	115	109	97	115	102	90	115	96	85	115	90	80	103	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	115	102	90	115	94	84	115	88	78	105	82	73	97	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	133	133	133	133	133	133	133	133	124	133	122	114	133	114	107	133	107	100	130	101	94	114	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	133	113	106	133	105	98	125	98	91	116	92	85	109	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	137	137	137	137	137	137	137	137	128	137	137	118	137	130	111	137	120	104	137	113	99	119	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	137	129	111	137	118	103	136	110	96	121	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
20	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	94	95	95	86	95	95	79	95	88	73	95	82	68			
			Exposed	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	88	95	95	80	95	87	73	95	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	92	96	94	84	96	86	77	96	79	71	91	73	65			
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	91	96	96	86	96	87	77	96	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	109	116	105	98	116	96	89	112	88	82	104	82	76			
			Exposed	116	116	116	116	116	116	116	116	116	116	116	116	116	116	115	116	115	108	116	108	101	116	97	90	111	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	113	123	118	103	123	108	94	116	100	87	107	93	81			
			Exposed	123	123	123	123	123	123	123	123	123	123	123	123	123	123	119	123	123	112	123	121	106	123	109	95	114	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	92	95	95	83	95	91	76	95	83	69	93	77	64	86	71	59	80	67	51			
			Exposed	95	95	95	95	95	95	95	95	90	95	95	84	95	95	79	95	90	75	95	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	91	81	96	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	96	96	96	96	96	94	96	96	88	96	92	82	96	86	77	96	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	113	116	113	106	116	101	95	116	92	85	106	83	77	97	77	71	90	71	65	83	66	57
			Exposed	116	116	116	116	116	111	116	110	103	116	103	96	116	96	90	115	91	84	109	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	117	123	123	110	123	114	99	120	103	90	109	94	82	99	87	76	91	80	70	84	75	65
			Exposed	123	123	123	123	123	115	123	123	107	123	116	101	123	109	95	119	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	87	95	95	83	95	90	75	95	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	95	95	92	95	95	86	95	95	81	95	91	76	95	86	71	95	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	96	85	96	90	80	96	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	96	96	90	96	94	84	96	88	78	96	82	73	96	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	119	119	119	119	119	119	119	119	119	119	119	114	119	114	107	119	107	100	119	101	94	114	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	119	113	106	119	105	98	119	98	91	116	92	85	109	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	125	125	125	125	125	125	125	125	125	125	125	118	125	125	111	125	120	104	125	113	99	119	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	125	125	111	125	118	103	125	110	96	121	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	86	94	94	79	94	88	73	94	82	68
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	93	94	94	88	94	94	80	94	87	73	94	80	67	89	74	61	83	69	55	77	64	46
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	92	96	94	84	96	86	77	96	79	71	91	73	65
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	91	96	96	86	96	87	77	96	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	98	106	96	89	106	88	82	104	82	76
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	101	106	97	90	106	87	81	101	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	103	113	108	94	113	100	87	107	93	81
			Exposed	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	112	113	113	106	113	109	95	113	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	92	94	94	83	94	91	76	94	83	69	93	77	64	86	71	59	80	67	51
			Exposed	94	94	94	94	94	94	94	94	90	94	94	84	94	94	79	94	90	75	94	85	71	94	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	91	81	96	82	73	93	75	67	83	69	61	76	63	54	69	59	44
			Exposed	96	96	96	96	96	94	96	96	88	96	92	82	96	86	77	96	81	72	96	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	101	95	106	92	85	106	83	77	97	77	71	90	71	65	83	66	57
			Exposed	106	106	106	106	106	106	106	106	103	106	103	96	106	96	90	106	91	84	106	86	79	98	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	110	113	113	99	113	103	90	109	94	82	99	87	76	91	80	70	84	75	65
			Exposed	113	113	113	113	113	113	113	113	107	113	113	101	113	109	95	113	102	89	112	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	93	95	95	87	95	95	83	95	90	75	95	82	68	91	75	62	84	69	57	78	64	47	72	60	40
			Exposed	95	95	92	95	95	86	95	95	81	95	91	76	95	86	71	95	81	68	93	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	96	85	96	90	80	96	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	96	96	90	96	94	84	96	88	78	96	82	73	96	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	107	108	107	100	108	101	94	108	90	84	103	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	108	108	106	108	105	98	108	98	91	108	92	85	108	86	80	103	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	111	115	115	104	115	113	99	115	102	89	106	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	115	115	111	115	115	103	115	110	96	115	103	90	112	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
40	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	85	73	85	82	68
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	85	73	85	80	67	85	74	61	83	69	55	77	64	46
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	86	77	88	79	71	88	73	65	88	73	65	88	73	65
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	87	77	88	78	70	88	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	96	89	97	88	82	97	82	76
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	90	97	87	81	97	80	74	93	73	68	86	68	61	80	63	52
		27-45	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	103	105	105	94	105	100	87	102	93	81
			Exposed	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	95	105	99	86	103	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	76	85	83	69	85	77	64	85	71	59	80	67	51
			Exposed	85	85	85	85	85	85	85	85	85	85	85	84	85	85	79	85	85	75	85	85	71	85	77	64	85	71	59	78	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	81	88	82	73	88	75	67	83	69	61	76	63	54	69	59	44
			Exposed	88	88	88	88	88	88	88	88	88	88	88	82	88	86	77	88	81	72	88	77	68	84	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	95	97	92	85	97	83	77	97	77	71	90	71	65	83	66	57
			Exposed	97	97	97	97	97	97	97	97	97	97	97	96	97	96	90	97	91	84	97	86	79	97	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	99	105	103	90	103	94	82	99	87	76	91	80	70	84	75	65
			Exposed	105	105	105	105	105	105	105	105	101	105	105	101	105	105	95	105	102	89	105	97	84	100	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	88	88	83	88	88	75	88	82	68	88	75	62	84	69	57	78	64	47	72	60	40
			Exposed	88	88	88	88	88	86	88	88	81	88	88	76	88	86	71	88	81	68	88	77	64	84	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	91	91	85	91	90	80	91	81	72	91	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	91	91	90	91	91	84	91	88	78	91	82	73	91	77	69	90	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	94	100	90	84	100	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	100	100	100	100	100	98	100	98	91	100	92	85	100	86	80	100	81	75	97	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	104	108	108	99	108	102	89	105	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	108	108	108	108	108	103	108	108	96	108	103	90	108	97	85	105	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
50	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	68
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	67	77	74	61	77	69	55	77	64	46
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	79	71	80	73	65
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	78	70	80	71	64	79	66	58	72	61	48	67	53	39
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	89	91	88	82	91	82	76
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	90	91	87	81	91	80	74	91	73	68	86	68	61	80	63	52
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	94	98	98	87	96	93	81
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	95	98	98	86	98	90	79	94	83	72	87	77	67	80	71	62
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	69	77	77	64	77	71	59	77	67	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	71	77	77	64	77	71	59	77	65	48	72	60	40	67	53	34	63	45	30
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	73	80	75	67	80	69	61	76	63	54	69	59	44
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	80	72	80	77	68	80	69	62	75	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	85	91	83	77	91	77	71	90	71	65	83	66	57	77	64	50
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	84	91	86	79	91	77	71	89	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	90	96	94	82	94	87	76	91	80	70	84	75	65	77	67	50
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	95	98	98	89	98	97	84	98	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	75	81	81	68	81	75	62	81	69	57	78	64	47	72	60	40
			Exposed	81	81	81	81	81	81	81	81	81	81	81	76	81	81	71	81	81	68	81	77	64	81	70	58	77	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	80	84	81	72	84	73	65	81	67	60	73	61	49	67	54	40	63	45	34
			Exposed	84	84	84	84	84	84	84	84	78	84	82	73	84	77	69	84	73	65	84	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	90	84	94	82	76	94	75	69	87	69	63	80	63	53	75	59	46
			Exposed	94	94	94	94	94	94	94	94	91	94	92	85	94	86	80	94	81	75	94	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	99	101	101	89	99	92	81	96	85	74	88	78	68	81	72	63	75	67	58
			Exposed	101	101	101	101	101	101	101	101	96	101	101	90	101	97	85	101	92	80	99	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	61	71	69	55	71	64	46
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	73	65
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	70	74	71	64	74	66	58	72	61	48	67	53	39
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	82	85	82	76
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	81	85	80	74	85	73	68	85	68	61	80	63	52
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	92	92	87	91	91	81
			Exposed	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	86	93	90	79	93	83	72	87	77	67	80	71	62
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	71	64	71	71	59	71	67	51
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	64	71	71	59	71	65	48	71	60	40	67	53	34
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	67	74	69	61	74	63	54	69	59	44
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	74	74	68	74	69	62	74	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	77	85	77	71	85	71	65	83	66	57
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	85	85	79	85	77	71	85	70	64	81	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	90	91	91	82	89	87	76	87	80	70	84	75	65
			Exposed	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	89	93	93	84	93	87	76	90	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	68	74	74	62	74	69	57	74	64	47	72	60	40
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	68	74	74	64	74	70	58	74	64	46	71	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	72	78	73	65	78	67	60	73	61	49	67	54	40	63	45	34
			Exposed	78	78	78	78	78	78	78	78	78	73	78	77	69	78	73	65	78	69	61	74	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	82	76	88	75	69	87	69	63	80	63	53	75	59	46
			Exposed	88	88	88	88	88	88	88	88	88	88	88	85	88	86	80	88	81	75	88	77	71	87	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	89	94	92	81	91	85	74	88	78	68	81	72	63	75	67	58
			Exposed	96	96	96	96	96	96	96	96	96	96	96	90	96	96	85	96	92	80	96	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
70	B	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	66	55	66	64	46
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	65
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	64	69	66	58	69	61	48	67	53	39
		20-27	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	76
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	74	80	73	68	80	68	61	80	63	52
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	87	87	86	86	81
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	88	79	88	83	72	87	77	67	80	71	62
	C	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	64	66	66	59	66	66	51	66	66	51
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	64	66	66	59	66	65	48	66	60	40	66	53	34	63	45	30
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	61	69	63	54	69	59	44
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	62	69	63	52	68	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	77	80	77	71	80	71	65	80	66	57
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	80	77	71	80	70	64	80	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	86	82	85	85	76	83	80	70	81	75	65
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	87	76	88	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	62	69	69	57	69	64	47	69	60	40
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	64	69	69	58	69	64	46	69	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	65	72	67	60	72	61	49	67	54	40	63	45	34
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	72	65	72	69	61	72	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	76	84	75	69	84	69	63	80	63	53	75	59	46
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	80	84	81	75	84	77	71	84	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	89	89	89	81	87	85	74	85	78	68	81	72	63	75	67	58
			Exposed	91	91	91	91	91	91	91	91	91	91	91	90	91	91	85	91	91	80	91	87	76	89	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	55	62	62	46
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	58	64	61	48	64	53	39
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	73	68	75	68	61	75	63	52	75	63	52
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	81
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	79	84	83	72	83	77	67	80	71	62
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	55	62	62	46
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	62	64	63	52	64	56	41	63	45	34	59	37	30	52	32	26
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	65	75	66	57
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	70	64	75	64	54	75	59	46	69	49	38	65	41	32
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	82	82	81	81	76	79	79	70	78	75	65
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	76	84	79	69	82	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	57	65	64	47	65	60	40
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	65	65	58	65	64	46	65	59	38	65	49	32	61	42	28	54	36	25
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	67	60	68	61	49	67	54	40	63	45	34
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	65	68	68	61	68	62	50	67	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	75	69	79	69	63	79	63	53	75	59	46
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	75	79	79	71	79	69	64	79	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	85	85	81	83	83	74	81	78	68	79	72	63	75	67	58
			Exposed	87	87	87	87	87	87	87	87	87	87	87	87	87	87	85	87	87	80	87	87	76	87	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	46
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	58	61	61	48	61	53	39		
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	71	68	61	71	63	52		
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	77	67	79	71	62
	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	51
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	48	58	58	40
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	56	41	61	45	34	59	37	30	52	32	26
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	65	71	66	57
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	64	71	64	54	71	59	46	69	49	38	65	41	32
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	78	76	76	76	70	75	75	65
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	79	69	79	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	57	61	61	47	61	60	40
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	58	61	61	46	61	59	38	61	49	32	61	42	28	54	36	25
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	61	49	64	54	40	63	45	34
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	62	50	64	53	39	62	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	69	74	69	63	74	63	53	74	59	46
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	69	64	74	63	52	73	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	80	74	78	78	68	77	72	63	75	67	58
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	83	83	76	83	78	68	80	71	62	73	65	55	67	60	45	61	52	37	55	44	32
100	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	46
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	48	58	53	39
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	63	52
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	72	76	76	67	76	71	62
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	34
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	44
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	56	41	58	45	34	58	37	30	52	32	26
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	66	57
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	64	67	64	54	67	59	46	67	49	38	65	41	32
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	75	75	73	73	70	72	72	65
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	69	76	73	63	75	67	58	69	62	49	64	57	41
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	57	58	58	47	58	58	40
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	46	58	58	38	58	49	32	58	42	28	54	36	25
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	49	61	54	40	61	45	34
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	50	61	53	39	61	42	32	56	34	28	48	30	25	42	27	22
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	71	69	63	71	63	53	71	59	46
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	69	64	71	63	52	71	56	43	67	45	35	63	37	30	59	32	25
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	74	76	76	68	74	72	63	72	67	58
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	78	68	79	71	62	73	65	55	67	60	45	61	52	37	55	44	32

Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

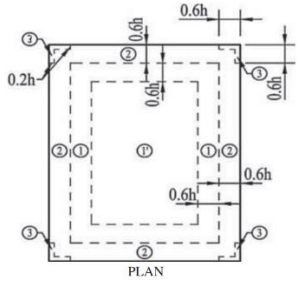
Seismic Design Assumptions

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

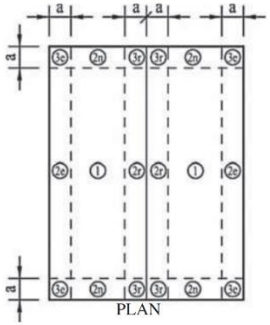
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

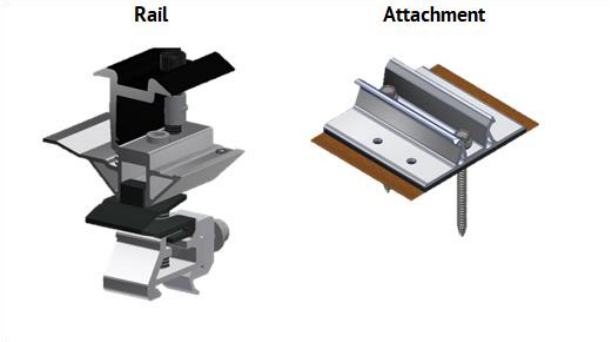
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Micro Rail - DtD Rafter

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	102	106	106	96	106	102	72	106	87	56	104	70	44	94	57	36	77	47	30	64	40	25
			Exposed	106	106	106	106	106	101	106	106	89	106	104	75	106	98	63	106	85	55	106	74	47	95	58	37	75	46	29	60	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	105	107	107	99	107	99	71	107	73	52	103	55	40	91	43	32	83	35	26	46	29	21
			Exposed	107	107	107	107	107	104	107	107	93	107	100	74	107	87	61	107	72	51	107	60	43	92	44	32	71	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	106	107	98	89	107	76	63	102	59	48	89	47	37	72	38	30
			Exposed	107	107	107	107	107	107	107	107	107	107	107	107	107	104	99	107	97	86	107	82	69	103	60	49	86	46	36	67	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	105	108	108	92	108	99	70	108	81	56	101	65	45	82	53	37
			Exposed	108	108	108	108	108	108	108	108	108	108	108	107	108	108	100	108	108	89	108	102	76	108	83	57	99	63	44	75	50	35	56	40	28	44	33	24	35	28	20
	C	0-7	Interior	106	106	106	106	106	106	106	106	98	106	106	84	106	102	71	106	96	61	106	83	53	101	64	41	83	51	32	67	42	26	54	35	22	45	29	19	38	25	17
			Exposed	106	102	71	106	92	59	106	78	50	102	67	42	95	58	37	82	50	32	71	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	107	107	107	107	107	107	107	107	101	107	106	87	107	98	70	107	83	58	107	69	49	97	50	36	86	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	107	98	69	107	79	55	107	63	45	99	52	38	91	44	32	85	37	27	60	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	106	107	102	98	107	95	82	107	68	56	97	52	41	75	40	32	60	32	25	49	26	20	41	22	17
			Exposed	107	107	106	107	101	96	107	87	74	107	71	59	102	60	48	95	50	40	81	43	34	61	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	105	108	108	99	108	107	86	108	94	64	105	71	49	88	56	39	65	45	32	50	37	26	40	31	22
			Exposed	108	108	105	108	108	97	108	104	80	108	97	67	108	82	56	104	70	48	97	60	42	66	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	106	106	101	106	106	89	106	104	74	106	97	63	106	84	54	106	73	46	100	63	40	81	50	31	64	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	106	83	53	104	70	45	97	60	38	84	51	33	72	45	28	62	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	107	107	104	107	107	94	107	100	74	107	85	60	107	70	50	107	58	42	96	49	36	85	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	107	69	49	104	56	40	93	46	33	86	38	28	62	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	103	99	107	96	83	107	80	67	107	67	55	94	50	40	71	38	30	56	30	23	45	24	19	38	20	16	33	18	14
			Exposed	107	95	82	107	76	63	104	62	50	97	52	41	82	44	34	70	37	29	60	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	108	108	108	108	108	108	108	108	107	108	108	100	108	107	87	108	101	74	108	92	63	103	69	48	82	53	37	59	42	30	45	34	24	36	28	20	29	24	18
			Exposed	108	107	87	108	99	71	108	86	59	105	72	50	98	61	42	79	52	37	65	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
10	B	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	72	89	87	56	89	70	44	89	57	36	77	47	30	64	40	25			
			Exposed	89	89	89	89	89	89	89	89	89	89	89	75	89	89	63	89	85	55	89	74	47	89	58	37	75	46	29	60	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	71	90	73	52	90	55	40	90	43	32	83	35	26	46	29	21
			Exposed	90	90	90	90	90	90	90	90	90	90	90	74	90	87	61	90	72	51	90	60	43	90	44	32	71	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	98	89	103	76	63	102	59	48	89	47	37	72	38	30
			Exposed	103	103	103	103	103	103	103	103	103	103	103	103	103	103	99	103	97	86	103	82	69	103	60	49	86	46	36	67	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	105	106	106	92	106	99	70	106	81	56	101	65	45	82	53	37
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	100	106	106	89	106	102	76	106	83	57	99	63	44	75	50	35	56	40	28	44	33	24	35	28	20
	C	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	84	89	89	71	89	89	61	89	83	53	89	64	41	83	51	32	67	42	26	54	35	22	45	29	19	38	25	17
			Exposed	89	89	71	89	89	59	89	78	50	89	67	42	89	58	37	82	50	32	71	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	87	90	90	70	90	83	58	90	69	49	90	50	36	86	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	90	90	69	90	79	55	90	63	45	90	52	38	90	44	32	85	37	27	60	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	102	98	103	95	82	103	68	56	97	52	41	75	40	32	60	32	25	49	26	20	41	22	17
			Exposed	103	103	103	103	101	96	103	87	74	103	71	59	102	60	48	95	50	40	81	43	34	61	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	105	106	106	99	106	106	86	106	94	64	105	71	49	88	56	39	65	45	32	50	37	26	40	31	22
			Exposed	106	106	105	106	106	97	106	104	80	106	97	67	106	82	56	104	70	48	97	60	42	66	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	89	89	89	89	89	89	89	89	74	89	89	63	89	84	54	89	73	46	89	63	40	81	50	31	64	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	89	83	53	89	70	45	89	60	38	84	51	33	72	45	28	62	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	90	90	90	90	90	90	90	90	74	90	85	60	90	70	50	90	58	42	90	49	36	85	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	90	69	49	90	56	40	90	46	33	86	38	28	62	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	104	104	104	104	104	104	104	104	104	104	103	99	104	96	83	104	80	67	104	67	55	94	50	40	71	38	30	56	30	23	45	24	19	38	20	16	33	18	14
			Exposed	104	95	82	104	76	63	104	62	50	97	52	41	82	44	34	70	37	29	60	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	108	108	108	108	108	108	108	108	107	108	108	100	108	107	87	108	101	74	108	92	63	103	69	48	82	53	37	59	42	30	45	34	24	36	28	20	29	24	18
			Exposed	108	107	87	108	99	71	108	86	59	105	72	50	98	61	42	79	52	37	65	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
20	B	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	56	74	70	44	74	57	36	74	47	30	64	40	25			
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	63	74	74	55	74	74	47	74	58	37	74	46	29	60	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	73	52	75	55	40	75	43	32	75	35	26	46	29	21
			Exposed	75	75	75	75	75	75	75	75	75	75	75	74	75	75	61	75	72	51	75	60	43	75	44	32	71	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	89	91	76	63	91	59	48	89	47	37	72	38	30			
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	86	91	82	69	91	60	49	86	46	36	67	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	92	96	96	70	96	81	56	96	65	45	82	53	37
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	89	96	96	76	96	83	57	96	63	44	75	50	35	56	40	28	44	33	24	35	28	20
	C	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	74	61	74	74	53	74	64	41	74	51	32	67	42	26	54	35	22	45	29	19	38	25	17
			Exposed	74	74	71	74	74	59	74	74	50	74	67	42	74	58	37	74	50	32	71	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	75	58	75	69	49	75	50	36	75	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	75	75	69	75	75	55	75	63	45	75	52	38	75	44	32	75	37	27	60	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	82	91	68	56	91	52	41	75	40	32	60	32	25	49	26	20	41	22	17
			Exposed	91	91	91	91	91	91	91	87	74	91	71	59	91	60	48	91	50	40	81	43	34	61	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	92	96	96	70	96	81	56	96	65	45	82	53	37
			Exposed	96	96	96	96	96	96	96	96	80	96	96	67	96	82	56	96	70	48	96	60	42	66	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	63	74	74	54	74	73	46	74	63	40	74	50	31	64	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	74	74	53	74	70	45	74	60	38	74	51	33	72	45	28	62	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	75	75	75	75	75	75	75	75	74	75	75	60	75	70	50	75	58	42	75	49	36	75	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	75	69	49	75	56	40	75	46	33	75	38	28	62	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	83	93	80	67	93	67	55	93	50	40	71	38	30	56	30	23	45	24	19	38	20	16	33	18	14
			Exposed	93	93	82	93	76	63	93	62	50	93	52	41	82	44	34	70	37	29	60	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	87	98	98	74	98	92	63	98	69	48	82	53	37	59	42	30	45	34	24	36	28	20	29	24	18
			Exposed	98	98	87	98	98	71	98	86	59	98	72	50	98	61	42	79	52	37	65	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	72	73	73	56	73	70	44	73	57	36	73	47	30	64	40	25
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	63	73	73	55	73	73	47	73	58	37	73	46	29	60	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	75	73	52	75	55	40	75	43	32	75	35	26	46	29	21
			Exposed	75	75	75	75	75	75	75	75	75	75	75	74	75	75	61	75	72	51	75	60	43	75	44	32	71	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	76	63	83	59	48	83	47	37	72	38	30
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	69	83	60	49	83	46	36	67	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	70	88	81	56	88	65	45	82	53	37
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	75	50	35	56	40	28	44	33	24	35	28	20
	C	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	71	73	73	61	73	73	53	73	64	41	73	51	32	67	42	26	54	35	22	45	29	19	38	25	17
			Exposed	73	73	71	73	73	59	73	73	50	73	67	42	73	58	37	73	50	32	71	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	70	75	75	58	75	69	49	75	50	36	75	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	75	75	69	75	75	55	75	63	45	75	52	38	75	44	32	75	37	27	60	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	83	82	83	68	56	83	52	41	75	40	32	60	32	25	49	26	20	41	22	17
			Exposed	83	83	83	83	83	83	83	83	74	83	71	59	83	60	48	83	50	40	81	43	34	61	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	64	88	71	49	88	56	39	65	45	32	50	37	26	40	31	22
			Exposed	88	88	88	88	88	88	88	88	80	88	88	67	88	82	56	88	70	48	88	60	42	66	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	63	74	74	54	74	73	46	74	63	40	74	50	31	64	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	74	74	53	74	70	45	74	60	38	74	51	33	72	45	28	62	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	75	75	75	75	75	75	75	75	74	75	75	60	75	70	50	75	58	42	75	49	36	75	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	75	69	49	75	56	40	75	46	33	75	38	28	62	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	80	67	85	67	55	85	50	40	71	38	30	56	30	23	45	24	19	38	20	16	33	18	14
			Exposed	85	85	82	85	76	63	85	62	50	85	52	41	82	44	34	70	37	29	60	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	90	74	90	90	63	90	69	48	82	53	37	59	42	30	45	34	24	36	28	20	29	24	18
			Exposed	90	90	87	90	90	71	90	86	59	90	72	50	90	61	42	79	52	37	65	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
40	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	56	67	67	44	67	57	36	67	47	30	64	40	25
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	63	67	67	55	67	67	47	67	58	37	67	46	29	60	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	52	69	69	52	69	55	40	69	43	32	69	35	26	46	29	21
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	61	69	69	51	69	60	43	69	44	32	69	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	63	76	59	48	76	47	37	72	38	30
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	69	76	60	49	76	46	36	67	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	70	72	72	56	72	65	45	72	53	37
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	57	72	63	44	72	50	35	56	40	28	44	33	24	35	28	20
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	53	67	64	41	67	51	32	67	42	26	54	35	22	45	29	19	38	25	17
			Exposed	67	67	67	67	67	59	67	67	50	67	67	42	67	58	37	67	50	32	67	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	58	69	69	49	69	50	36	69	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	69	69	69	69	69	55	69	63	45	69	52	38	69	44	32	69	37	27	60	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	68	56	76	52	41	75	40	32	60	32	25	49	26	20	41	22	17
			Exposed	76	76	76	76	76	76	76	76	74	76	71	59	76	60	48	76	50	40	76	43	34	61	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	64	72	71	49	72	56	39	65	45	32	50	37	26	40	31	22
			Exposed	72	72	72	72	72	72	72	72	72	72	72	67	72	72	56	72	70	48	72	60	42	66	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	69	69	69	69	69	69	69	69	69	69	69	63	69	69	54	69	69	46	69	63	40	69	50	31	64	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	69	69	53	69	69	45	69	60	38	69	51	33	69	45	28	62	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	71	71	71	71	71	71	71	71	71	71	71	60	71	70	50	71	58	42	71	49	36	71	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	71	69	49	71	56	40	71	46	33	71	38	28	62	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	67	78	67	55	78	50	40	71	38	30	56	30	23	45	24	19	38	20	16	33	18	14
			Exposed	78	78	78	78	76	63	78	62	50	78	52	41	78	44	34	70	37	29	60	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	74	79	79	63	79	69	48	79	53	37	59	42	30	45	34	24	36	28	20	29	24	18
			Exposed	79	79	79	79	79	71	79	79	59	79	72	50	79	61	42	79	52	37	65	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
50	B	0-7	Interior	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	44	60	57	36	60	47	30	60	40	25
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	55	60	60	47	60	58	37	60	46	29	60	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	52	63	63	52	63	55	40	63	43	32	63	35	26	46	29	21
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	61	63	63	51	63	60	43	63	44	32	63	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	59	48	63	47	37	63	38	30
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	60	49	63	46	36	63	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	56	59	59	45	59	53	37
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	57	59	59	44	59	50	35	56	40	28	44	33	24	35	28	20			
	C	0-7	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	53	60	60	41	60	51	32	60	42	26	54	35	22	45	29	19	38	25	17
			Exposed	60	60	60	60	60	59	60	60	50	60	60	42	60	58	37	60	50	32	60	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	49	63	50	36	63	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	63	63	63	63	63	55	63	63	45	63	52	38	63	44	32	63	37	27	60	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	41	63	40	32	60	32	25	49	26	20	41	22	17			
			Exposed	63	63	63	63	63	63	63	63	63	63	63	59	63	60	48	63	50	40	63	43	34	61	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	49	59	56	39	59	45	32	50	37	26	40	31	22			
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	56	59	59	48	59	59	42	59	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	54	63	63	46	63	63	40	63	50	31	63	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	63	63	53	63	63	45	63	60	38	63	51	33	63	45	28	62	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	66	66	66	66	66	66	66	66	66	66	66	60	66	66	50	66	58	42	66	49	36	66	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	66	66	49	66	56	40	66	46	33	66	38	28	62	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	67	55	69	50	40	69	38	30	56	30	23	45	24	19	38	20	16	33	18	14
			Exposed	69	69	69	69	69	63	69	62	50	69	52	41	69	44	34	69	37	29	60	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	48	65	53	37	59	42	30	45	34	24	36	28	20	29	24	18
			Exposed	65	65	65	65	65	65	65	65	59	65	65	50	65	61	42	65	52	37	65	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	55	40	58	43	32	58	35	26	46	29	21
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	51	58	58	43	58	44	32	58	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	47	37	53	38	30
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	46	36	53	36	28	53	29	22	44	24	19	38	20	16
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	37
			Exposed	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	35	50	40	28	44	33	24	35	28	20			
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	50	36	58	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	58	58	58	58	58	55	58	58	45	58	52	38	58	44	32	58	37	27	58	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	41	53	40	32	53	32	25	49	26	20	41	22	17			
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	50	40	53	43	34	53	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	39	50	45	32	50	37	26	40	31	22			
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	42	50	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	46	58	58	40	58	50	31	58	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	58	58	53	58	58	45	58	58	38	58	51	33	58	45	28	58	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	60	61	61	50	61	58	42	61	49	36	61	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	61	61	49	61	56	40	61	46	33	61	38	28	61	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	50	40	58	38	30	56	30	23	45	24	19	38	20	16	33	18	14
			Exposed	58	58	58	58	58	58	58	58	50	58	52	41	58	44	34	58	37	29	58	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
70	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	36	51	47	30	51	40	25
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	37	51	46	29	51	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	52	54	54	40	54	43	32	54	35	26	46	29	21			
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	43	54	44	32	54	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	38	30
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	36	46	36	28	46	29	22	44	24	19	38	20	16
		27-45	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	37
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	41	51	51	32	51	42	26	51	35	22	45	29	19	38	25	17
			Exposed	51	51	51	51	51	51	51	51	50	51	51	42	51	51	37	51	50	32	51	44	28	51	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	50	36	54	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	54	54	54	54	54	54	54	54	45	54	52	38	54	44	32	54	37	27	54	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	40	32	46	32	25	46	26	20	41	22	17			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	43	34	46	33	25	46	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	39	44	44	32	44	37	26	40	31	22
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	32	44	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	50	31	54	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	54	54	53	54	54	45	54	54	38	54	51	33	54	45	28	54	39	25	54	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	56	56	42	56	49	36	56	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	56	56	49	56	56	40	56	46	33	56	38	28	56	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	40	51	38	30	51	30	23	45	24	19	38	20	16	33	18	14
			Exposed	51	51	51	51	51	51	51	51	50	51	51	41	51	44	34	51	37	29	51	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	37	48	42	30	45	34	24	36	28	20	29	24	18
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	48	37	48	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
80	B	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	44	48	48	36	48	47	30	48	40	25
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	47	48	48	37	48	46	29	48	38	24	48	31	20	41	26	18	35	22	16
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	40	49	43	32	49	35	26	46	29	21						
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	43	49	44	32	49	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	38	30
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	36	28	40	29	22	40	24	19	38	20	16
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	28	39	33	24	35	28	20
	C	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	41	48	48	32	48	42	26	48	35	22	45	29	19	38	25	17
			Exposed	48	48	48	48	48	48	48	48	48	48	48	42	48	48	37	48	48	32	48	44	28	48	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	36	49	38	28	49	30	22	39	24	19	33	20	17	29	18	15
			Exposed	49	49	49	49	49	49	49	49	45	49	49	38	49	44	32	49	37	27	49	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	32	40	40	25	40	26	20	40	22	17
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	33	25	40	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	39	25	39	31	22			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	50	31	51	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	51	51	51	51	51	45	51	51	38	51	51	33	51	45	28	51	39	25	51	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	42	53	49	36	53	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	53	53	49	53	53	40	53	46	33	53	38	28	53	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	38	30	45	30	23	45	24	19	38	20	16	33	18	14
			Exposed	45	45	45	45	45	45	45	45	45	45	45	41	45	44	34	45	37	29	45	32	25	45	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	42	30	43	34	24	36	28	20	29	24	18
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	37	43	43	32	43	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	36	46	46	30	46	40	25
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	29	46	38	24	46	31	20	41	26	18	35	22	16
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	43	32	44	35	26	44	29	21
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	32	44	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	28	36	29	22	36	24	19	36	20	16
		27-45	Interior	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	34	34	34	34	34	34	34	34	34	34
			Exposed	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	34	34	34	34	34	34	34	34	28	20
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	32	46	42	26	46	35	22	45	29	19	38	25	17
			Exposed	46	46	46	46	46	46	46	46	46	46	46	42	46	46	37	46	46	32	46	44	28	46	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	36	44	38	28	44	30	22	39	24	19	33	20	17	29	18	15
			Exposed	44	44	44	44	44	44	44	44	44	44	44	38	44	44	32	44	37	27	44	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	32	25	36	26	20	36	22	17	36	24	19	36	20	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	33	25	36	26	20	36	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	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	34	34	34	34	34	34	34	34	31	22
			Exposed	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	25	34	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	48	31	48	40	25	48	33	21	42	27	18	35	23	16	30	20	14
			Exposed	48	48	48	48	48	45	48	48	38	48	48	33	48	45	28	48	39	25	48	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	48	36	48	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	48	48	48	48	48	40	48	46	33	48	38	28	48	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	30	40	30	23	40	24	19	38	20	16	33	18	14
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	37	29	40	32	25	40	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	30	38	34	24	36	28	20	29	24	18
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	32	38	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
100	B	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	30	43	40	25
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	29	43	38	24	43	31	20	41	26	18	35	22	16
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	35	26	39	29	21
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	34	25	39	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30
			Exposed	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	28	33	29	22	33	24	19	33	20	16
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	24	31	28	20
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	32	43	42	26	43	35	22	43	29	19	38	25	17
			Exposed	43	43	43	43	43	43	43	43	43	43	43	42	43	43	37	43	43	32	43	43	28	43	35	22	43	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	38	28	39	30	22	39	24	19	33	20	17	29	18	15
			Exposed	39	39	39	39	39	39	39	39	39	39	39	38	39	39	32	39	37	27	39	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	25	33	26	20	33	22	17
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	25	33	26	20	33	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	31	22
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	25	31	29	21	29	24	18	23	20	15	20	18	13			
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	40	25	46	33	21	42	27	18	35	23	16	30	20	14
			Exposed	46	46	46	46	46	45	46	46	38	46	46	33	46	45	28	46	39	25	46	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	36	44	37	27	44	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	44	44	44	44	44	40	44	44	33	44	38	28	44	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	30	23	36	24	19	36	20	16	33	18	14
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	29	36	32	25	36	25	19	36	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	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	30	34	34	24	34	28	20	29	24	18
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	25	34	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	137	138	138	126	138	138	117	138	127	105	138	114	93	130	104	75	117	96	61	108	80	50	101	67	42
			Exposed	138	138	136	138	138	123	138	138	114	138	130	107	138	120	100	138	113	92	135	107	80	118	97	62	107	78	49	98	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	126	138	138	116	138	117	103	138	105	87	138	93	67	113	73	53	101	59	43	78	48	36
			Exposed	138	138	138	138	138	122	138	132	113	138	119	105	138	111	98	138	104	85	138	98	72	114	74	54	100	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	136	125	139	117	110	139	106	99	124	97	80	113	79	63	105	65	51
			Exposed	139	139	139	139	139	139	139	139	139	139	139	129	139	126	116	139	116	109	139	109	102	126	98	81	112	77	61	102	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	129	140	136	114	140	120	104	135	110	94	117	101	76	108	90	63
			Exposed	140	140	140	140	140	140	140	140	140	140	140	132	140	140	120	140	135	113	140	124	107	137	110	95	116	100	74	105	84	59	94	68	48	73	56	40	59	47	34
	C	0-7	Interior	138	138	138	138	138	131	138	138	119	138	137	112	138	127	105	138	118	99	138	112	89	124	101	69	112	86	55	102	70	44	91	58	36	76	49	32	64	42	28
			Exposed	138	127	105	138	117	97	138	109	83	127	102	71	118	97	61	111	84	54	105	74	47	93	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	138	138	138	138	138	133	138	138	118	138	127	110	138	116	103	138	109	97	138	103	82	138	84	61	106	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	138	116	103	138	107	93	138	100	76	138	88	63	114	74	54	105	63	46	97	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	135	125	139	123	115	139	115	108	134	103	94	117	87	69	107	68	53	98	54	42	82	45	34	69	37	29
			Exposed	139	135	124	139	120	113	139	111	104	137	104	97	125	98	81	116	85	68	110	73	57	99	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	129	140	140	119	140	132	112	140	115	101	123	105	83	110	94	66	100	76	53	84	62	44	67	52	37
			Exposed	140	140	128	140	140	117	140	127	109	140	117	102	136	110	95	121	104	81	113	98	70	101	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	138	138	124	138	138	114	138	129	106	138	119	100	138	112	90	133	106	78	124	101	68	111	83	53	101	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	138	112	89	130	105	75	120	98	64	112	86	55	106	75	47	100	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	138	138	124	138	132	113	138	118	105	138	110	98	138	103	83	138	97	70	126	83	60	104	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	138	103	82	138	93	67	116	77	56	106	64	47	98	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	139	139	139	139	139	139	139	139	128	139	125	116	139	115	108	139	108	101	133	102	92	116	83	66	105	64	50	94	51	39	76	41	32	64	34	27	56	31	23
			Exposed	139	115	108	139	107	100	128	99	85	118	87	69	110	73	58	104	63	49	98	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	140	140	140	140	140	140	140	140	131	140	140	120	140	133	112	140	122	106	140	115	100	120	103	80	108	89	63	98	71	50	76	58	41	60	48	34	49	40	30
			Exposed	140	133	112	140	120	104	140	112	97	123	105	83	114	99	71	107	87	61	100	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
10	B	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	105	115	114	93	115	104	75	115	96	61	108	80	50	101	67	42
			Exposed	115	115	115	115	115	115	115	115	114	115	115	107	115	115	100	115	113	92	115	107	80	115	97	62	107	78	49	98	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	103	116	105	87	116	93	67	113	73	53	101	59	43	78	48	36
			Exposed	116	116	116	116	116	116	116	116	113	116	116	105	116	111	98	116	104	85	116	98	72	114	74	54	100	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	125	133	117	110	133	106	99	124	97	80	113	79	63	105	65	51
			Exposed	133	133	133	133	133	133	133	133	133	133	133	129	133	126	116	133	116	109	133	109	102	126	98	81	112	77	61	102	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	129	138	136	114	138	120	104	135	110	94	117	101	76	108	90	63
			Exposed	138	138	138	138	138	138	138	138	138	138	138	132	138	138	120	138	135	113	138	124	107	137	110	95	116	100	74	105	84	59	94	68	48	73	56	40	59	47	34
	C	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	112	115	115	105	115	115	99	115	112	89	115	101	69	112	86	55	102	70	44	91	58	36	76	49	32	64	42	28
			Exposed	115	115	105	115	115	97	115	109	83	115	102	71	115	97	61	111	84	54	105	74	47	93	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	110	116	116	103	116	109	97	116	103	82	116	84	61	106	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	116	116	103	116	107	93	116	100	76	116	88	63	114	74	54	105	63	46	97	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	133	133	133	133	133	133	133	133	133	133	133	133	133	133	125	133	123	115	133	115	108	133	103	94	117	87	69	107	68	53	98	54	42	82	45	34	69	37	29
			Exposed	133	133	124	133	120	113	133	111	104	133	104	97	125	98	81	116	85	68	110	73	57	99	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	129	138	138	119	138	132	112	138	115	101	123	105	83	110	94	66	100	76	53	84	62	44	67	52	37
			Exposed	138	138	128	138	138	117	138	127	109	138	117	102	136	110	95	121	104	81	113	98	70	101	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	115	115	115	115	115	114	115	115	106	115	115	100	115	112	90	115	106	78	115	101	68	111	83	53	101	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	115	112	89	115	105	75	115	98	64	112	86	55	106	75	47	100	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	116	116	116	116	116	113	116	116	105	116	110	98	116	103	83	116	97	70	116	83	60	104	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	116	103	82	116	93	67	116	77	56	106	64	47	98	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	134	134	134	134	134	134	134	134	128	134	125	116	134	115	108	134	108	101	133	102	92	116	83	66	105	64	50	94	51	39	76	41	32	64	34	27	56	31	23
			Exposed	134	115	108	134	107	100	128	99	85	118	87	69	110	73	58	104	63	49	98	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	139	139	139	139	139	139	139	139	131	139	139	120	139	133	112	139	122	106	139	115	100	120	103	80	108	89	63	98	71	50	76	58	41	60	48	34	49	40	30
			Exposed	139	133	112	139	120	104	139	112	97	123	105	83	114	99	71	107	87	61	100	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
20	B	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	93	96	96	75	96	96	61	96	80	50	96	67	42	96	67	42
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	92	96	96	80	96	96	62	96	78	49	96	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	87	97	97	67	97	73	53	97	59	43	78	48	36	78	48	36
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	85	97	97	72	97	74	54	97	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	110	118	106	99	118	97	80	113	79	63	105	65	51	105	65	51
			Exposed	118	118	118	118	118	118	118	118	118	118	118	118	118	118	116	118	116	109	118	109	102	118	98	81	112	77	61	102	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	114	124	120	104	124	110	94	117	101	76	108	90	63
			Exposed	124	124	124	124	124	124	124	124	124	124	124	124	124	124	120	124	124	113	124	124	107	124	110	95	116	100	74	105	84	59	94	68	48	73	56	40	59	47	34
	C	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	89	96	96	69	96	86	55	96	70	44	91	58	36	76	49	32	64	42	28
			Exposed	96	96	96	96	96	96	96	96	83	96	96	71	96	96	61	96	84	54	96	74	47	93	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	82	97	84	61	97	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	97	97	97	97	97	93	97	97	76	97	88	63	97	74	54	97	63	46	97	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	115	118	115	108	118	103	94	117	87	69	107	68	53	98	54	42	82	45	34	69	37	29
			Exposed	118	118	118	118	118	113	118	111	104	118	104	97	118	98	81	116	85	68	110	73	57	99	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	119	124	124	112	124	115	101	123	105	83	110	94	66	100	76	53	84	62	44	67	52	37
			Exposed	124	124	124	124	124	117	124	124	109	124	117	102	124	110	95	121	104	81	113	98	70	101	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	96	78	96	96	68	96	83	53	96	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	96	96	89	96	96	75	96	96	64	96	86	55	96	75	47	96	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	83	97	97	70	97	83	60	97	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	97	97	82	97	93	67	97	77	56	97	64	47	97	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	120	120	120	120	120	120	120	120	120	120	120	116	120	115	108	120	108	101	120	102	92	116	83	66	105	64	50	94	51	39	76	41	32	64	34	27	56	31	23
			Exposed	120	115	108	120	107	100	120	99	85	118	87	69	110	73	58	104	63	49	98	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	126	126	126	126	126	126	126	126	126	126	126	120	126	126	112	126	122	106	126	115	100	120	103	80	108	89	63	98	71	50	76	58	41	60	48	34	49	40	30
			Exposed	126	126	112	126	120	104	126	112	97	123	105	83	114	99	71	107	87	61	100	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	75	95	95	61	95	80	50	95	67	42
			Exposed	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	92	95	95	80	95	95	62	95	78	49	95	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	87	97	93	67	97	73	53	97	59	43	78	48	36
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	85	97	97	72	97	74	54	97	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	99	107	97	80	107	79	63	105	65	51
			Exposed	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	102	107	98	81	107	77	61	102	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	104	114	110	94	114	101	76	108	90	63
			Exposed	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	113	114	114	107	114	110	95	114	100	74	105	84	59	94	68	48	73	56	40	59	47	34
	C	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	89	95	95	69	95	86	55	95	70	44	91	58	36	76	49	32	64	42	28
			Exposed	95	95	95	95	95	95	95	95	83	95	95	71	95	95	61	95	84	54	95	74	47	93	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	82	97	84	61	97	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	97	97	97	97	97	93	97	97	76	97	88	63	97	74	54	97	63	46	97	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	103	94	107	87	69	107	68	53	98	54	42	82	45	34	69	37	29		
			Exposed	107	107	107	107	107	107	107	107	104	107	104	97	107	98	81	107	85	68	107	73	57	99	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	112	114	114	101	114	105	83	110	94	66	100	76	53	84	62	44	67	52	37
			Exposed	114	114	114	114	114	114	114	114	109	114	114	102	114	110	95	114	104	81	113	98	70	101	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	90	96	96	78	96	96	68	96	83	53	96	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	96	96	89	96	96	75	96	96	64	96	86	55	96	75	47	96	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	83	97	97	70	97	83	60	97	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	97	97	82	97	93	67	97	77	56	97	64	47	97	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	110	110	110	110	110	110	110	110	110	110	110	110	110	110	108	110	108	101	110	102	92	110	83	66	105	64	50	94	51	39	76	41	32	64	34	27	56	31	23
			Exposed	110	110	108	110	107	100	110	99	85	110	87	69	110	73	58	104	63	49	98	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	117	117	117	117	117	117	117	117	117	117	117	117	117	117	112	117	117	106	117	115	100	117	103	80	108	89	63	98	71	50	76	58	41	60	48	34	49	40	30
			Exposed	117	117	112	117	117	104	117	112	97	117	105	83	114	99	71	107	87	61	100	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
40	B	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	75	86	86	61	86	80	50	86	67	42
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	86	62	86	78	49	86	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	89	89	67	89	73	53	89	59	43	78	48	36
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	85	89	89	72	89	74	54	89	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	80	98	79	63	98	65	51
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	81	98	77	61	98	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	104	106	106	94	106	101	76	104	90	63
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	95	106	100	74	105	84	59	94	68	48	73	56	40	59	47	34
	C	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	69	86	86	55	86	70	44	86	58	36	76	49	32	64	42	28
			Exposed	86	86	86	86	86	86	86	86	83	86	86	71	86	86	61	86	84	54	86	74	47	86	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	82	89	84	61	89	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	89	89	89	89	89	89	89	89	76	89	88	63	89	74	54	89	63	46	89	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	94	98	87	69	98	68	53	98	54	42	82	45	34	69	37	29
			Exposed	98	98	98	98	98	98	98	98	98	98	98	97	98	98	81	98	85	68	98	73	57	98	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	101	106	105	83	104	94	66	100	76	53	84	62	44	67	52	37
			Exposed	106	106	106	106	106	106	106	106	106	106	106	102	106	106	95	106	104	81	106	98	70	101	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	78	89	89	68	89	83	53	89	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	89	89	89	89	89	75	89	89	64	89	86	55	89	75	47	89	66	41	89	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	70	92	83	60	92	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	92	92	82	92	92	67	92	77	56	92	64	47	92	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	101	102	102	92	102	83	66	102	64	50	94	51	39	76	41	32	64	34	27	56	31	23
			Exposed	102	102	102	102	102	100	102	99	85	102	87	69	102	73	58	102	63	49	98	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	106	109	109	100	109	103	80	107	89	63	98	71	50	76	58	41	60	48	34	49	40	30
			Exposed	109	109	109	109	109	104	109	109	97	109	105	83	109	99	71	107	87	61	100	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
50	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	78	61	78	78	50	78	67	42
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	62	78	78	49	78	63	40	78	53	34	69	44	30	58	38	26
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	67	81	73	53	81	59	43	78	48	36
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	72	81	74	54	81	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	79	63	92	65	51
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	77	61	92	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	94	99	99	76	97	90	63
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	74	99	84	59	94	68	48	73	56	40	59	47	34
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	69	78	78	55	78	70	44	78	58	36	76	49	32	64	42	28
			Exposed	78	78	78	78	78	78	78	78	78	78	78	71	78	78	61	78	78	54	78	74	47	78	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	61	81	64	47	81	50	37	65	41	32	56	34	28	48	30	25
			Exposed	81	81	81	81	81	81	81	81	76	81	81	63	81	74	54	81	63	46	81	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	87	69	92	68	53	92	54	42	82	45	34	69	37	29
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	85	92	73	57	92	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	83	98	94	66	95	76	53	84	62	44	67	52	37			
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	95	99	99	81	99	98	70	99	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	78	82	82	68	82	82	53	82	67	42	82	55	35	71	46	30	59	39	27	50	33	24
			Exposed	82	82	82	82	82	75	82	82	64	82	82	55	82	75	47	82	66	41	82	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	70	85	83	60	85	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	85	85	82	85	85	67	85	77	56	85	64	47	85	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	92	95	83	66	95	64	50	94	51	39	76	41	32	64	34	27	56	31	23
			Exposed	95	95	95	95	95	95	95	95	85	95	87	69	95	73	58	95	63	49	95	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	100	102	102	80	100	89	63	97	71	50	76	58	41	60	48	34	49	40	30
			Exposed	102	102	102	102	102	102	102	102	97	102	102	83	102	99	71	102	87	61	100	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	61	72	72	50	72	67	42
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	62	72	72	49	72	63	40	72	53	34	69	44	30	58	38	26
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	67	75	73	53	75	59	43	75	48	36
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	74	54	75	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	79	63	86	65	51
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	81	86	77	61	86	60	47	86	49	37	74	40	31	63	34	27
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	76	84	84	63
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	74	84	84	59	84	68	48	73	56	40	59	47	34			
	C	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	55	72	70	44	72	58	36	72	49	32	64	42	28
			Exposed	72	72	72	72	72	72	72	72	72	72	72	71	72	72	61	72	72	54	72	72	47	72	59	37	72	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	61	75	64	47	75	50	37	65	41	32	56	34	28	48	30	25
			Exposed	75	75	75	75	75	75	75	75	75	75	75	63	75	74	54	75	63	46	75	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	69	86	68	53	86	54	42	82	45	34	69	37	29			
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	81	86	85	68	86	73	57	86	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	84	84	66	84	76	53	84	62	44	67	52	37			
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	70	84	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	75	53	75	67	42	75	55	35	71	46	30	59	39	27	50	33	24
			Exposed	75	75	75	75	75	75	75	75	64	75	75	55	75	75	47	75	66	41	75	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	70	78	78	60	78	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	78	78	78	78	78	67	78	77	56	78	64	47	78	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	83	66	90	64	50	90	51	39	76	41	32	64	34	27	56	31	23
			Exposed	90	90	90	90	90	90	90	90	85	90	87	69	90	73	58	90	63	49	90	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	80	93	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	93	93	93	93	93	93	93	93	93	93	93	83	93	93	71	93	87	61	93	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
70	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	42
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	49	67	63	40	67	53	34	67	44	30	58	38	26
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	53	69	59	43	69	48	36
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	54	69	57	42	69	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	65	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	61	77	60	47	77	49	37	74	40	31	63	34	27
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	63
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	59	73	68	48	73	56	40	59	47	34
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	55	67	67	44	67	58	36	67	49	32	64	42	28
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	54	67	67	47	67	59	37	67	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	61	69	64	47	69	50	37	65	41	32	56	34	28	48	30	25
			Exposed	69	69	69	69	69	69	69	69	69	69	69	63	69	69	54	69	63	46	69	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	77	69	77	68	53	77	54	42	77	45	34	69	37	29
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	68	77	73	57	77	55	43	77	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	66	73	73	53	73	62	44	67	52	37
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	73	54	73	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	70	53	70	67	42	70	55	35	70	46	30	59	39	27	50	33	24
			Exposed	70	70	70	70	70	70	70	70	64	70	70	55	70	70	47	70	66	41	70	58	37	70	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	73	60	73	62	45	73	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	73	73	73	73	73	67	73	73	56	73	64	47	73	55	40	73	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	66	85	64	50	85	51	39	76	41	32	64	34	27	56	31	23
			Exposed	85	85	85	85	85	85	85	85	85	85	85	69	85	73	58	85	63	49	85	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	63	81	71	50	76	58	41	60	48	34	49	40	30
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	71	81	81	61	81	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	50	62	62	42
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	62	40	62	53	34	62	44	30	58	38	26
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	53	65	59	43	65	48	36
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	54	65	57	42	65	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	63	68	65	51
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	60	47	68	49	37	68	40	31	63	34	27
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	48	65	56	40	59	47	34
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	50	62	62	42
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	62	40	62	53	34	62	44	30	58	38	26
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	64	47	65	50	37	65	41	32	56	34	28	48	30	25
			Exposed	65	65	65	65	65	65	65	65	65	65	65	63	65	65	54	65	63	46	65	54	40	65	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	53	68	54	42	68	45	34	68	37	29
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	57	68	55	43	68	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	53	65	62	44	65	52	37
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	54	65	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	53	66	66	42	66	55	35	66	46	30	59	39	27	50	33	24
			Exposed	66	66	66	66	66	66	66	66	64	66	66	55	66	66	47	66	66	41	66	58	37	66	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	62	45	68	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	68	68	68	68	68	67	68	68	56	68	64	47	68	55	40	68	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	66	75	64	50	75	51	39	75	41	32	64	34	27	56	31	23
			Exposed	75	75	75	75	75	75	75	75	75	75	75	69	75	73	58	75	63	49	75	55	42	75	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	63	71	71	50	71	58	41	60	48	34	49	40	30			
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	61	71	71	54	71	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	50	59	59	42
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	49	59	59	40	59	53	34	59	44	30	58	38	26
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	59	43	61	48	36
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	57	42	61	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	51
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	47	61	49	37	61	40	31	61	34	27
		27-45	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	47	34
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	55	59	59	44	59	58	36	59	49	32	59	42	28
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	47	59	59	37	59	48	31	59	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	47	61	50	37	61	41	32	56	34	28	48	30	25
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	61	46	61	54	40	61	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	54	42	61	45	34	61	37	29
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	57	61	55	43	61	43	34	61	35	28	56	31	23	48	27	20	42	24	17			
		27-45	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	44	58	52	37
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	43	58	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	53	62	62	42	62	55	35	62	46	30	59	39	27	50	33	24
			Exposed	62	62	62	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	58	37	62	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	62	45	65	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	65	65	65	65	65	65	65	65	56	65	64	47	65	55	40	65	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	64	50	67	51	39	67	41	32	64	34	27	56	31	23
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	58	67	63	49	67	55	42	67	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	50	64	58	41	60	48	34	49	40	30
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	61	64	64	54	64	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
100	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	56	56	42
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	49	56	56	40	56	53	34	56	44	30	56	38	26
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	43	58	48	36
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	57	42	58	45	34	58	36	30	51	32	26	44	28	23
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51
			Exposed	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	47	55	49	37	55	40	31	55	34	27
		27-45	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	40	52	47	34
	C	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	44	56	56	36	56	49	32	56	42	28
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	47	56	56	37	56	48	31	56	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	47	58	50	37	58	41	32	56	34	28	48	30	25
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	46	58	54	40	58	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	54	42	55	45	34	55	37	29
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	43	55	43	34	55	35	28	55	31	23	48	27	20	42	24	17
		27-45	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	44	52	52	37
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	43	52	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	53	59	59	42	59	55	35	59	46	30	59	39	27	50	33	24
			Exposed	59	59	59	59	59	59	59	59	59	59	59	55	59	59	47	59	59	41	59	58	37	59	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	45	61	48	35	61	38	31	53	32	27	45	29	24	39	25	21
			Exposed	61	61	61	61	61	61	61	61	56	61	61	47	61	55	40	61	47	35	61	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	50	61	51	39	61	41	32	61	34	27	56	31	23
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	58	61	61	49	61	55	42	61	42	33	61	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	50	58	58	41	58	48	34	49	40	30
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	95	97	97	80	97	94	60	97	73	47	97	58	37	79	48	30	64	40	25	53	34	21
			Exposed	97	97	97	97	97	91	97	97	75	97	97	62	97	83	53	97	72	46	97	62	40	80	48	31	62	39	24	50	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	87	97	86	59	97	61	43	97	46	33	87	36	26	72	29	21	39	24	18
			Exposed	97	97	97	97	97	97	97	97	78	97	91	62	97	73	51	97	60	42	97	50	36	88	37	27	60	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	74	98	63	53	94	49	40	74	39	31	60	32	25			
			Exposed	98	98	98	98	98	98	98	98	98	98	98	98	98	98	91	98	83	72	98	69	58	96	50	41	72	38	30	56	30	23	45	24	19	37	20	15	32	17	13
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	77	99	87	59	99	68	47	95	55	38	69	45	31
			Exposed	99	99	99	99	99	99	99	99	99	99	99	99	99	99	90	99	99	75	99	94	64	99	69	48	90	53	37	62	42	29	47	34	24	36	28	20	29	23	17
	C	0-7	Interior	97	97	97	97	97	97	97	97	85	97	97	71	97	93	60	97	80	51	97	69	44	90	54	34	70	43	27	56	35	22	46	29	18	38	24	16	32	21	14
			Exposed	97	93	59	97	77	49	97	65	41	93	56	35	79	48	31	68	42	27	60	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	97	97	97	97	97	97	97	97	93	97	97	73	97	86	59	97	69	49	97	58	41	93	42	30	82	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	97	85	58	97	66	46	97	53	38	95	44	32	88	37	27	82	31	23	50	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	87	98	80	69	98	57	47	82	43	34	63	34	26	50	27	21	41	22	17	34	18	14
			Exposed	98	98	98	98	92	81	98	73	62	98	60	49	95	50	40	80	42	34	68	36	29	51	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	86	99	99	72	99	79	54	98	60	41	74	47	33	54	38	27	42	31	22	33	26	18
			Exposed	99	99	99	99	99	82	99	98	67	99	82	56	99	69	47	97	58	40	83	50	35	55	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	97	97	92	97	97	75	97	97	62	97	82	52	97	70	45	97	61	39	88	53	34	67	42	26	53	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	97	70	45	97	59	37	82	50	32	70	43	27	60	37	24	52	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	97	97	97	97	97	78	97	91	62	97	72	50	97	58	41	97	49	35	93	41	30	81	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	97	58	41	97	47	33	90	38	28	83	32	23	52	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	98	98	98	98	98	98	98	98	98	98	98	90	98	81	70	98	67	56	98	56	46	79	42	33	60	32	25	47	25	19	38	20	16	32	17	13	28	15	12
			Exposed	98	80	69	98	64	53	98	52	42	82	43	35	69	37	29	59	31	24	50	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	99	99	99	99	99	99	99	99	99	99	99	88	99	99	73	99	91	62	99	77	53	97	58	40	68	44	31	50	35	25	38	29	20	30	24	17	24	20	15
			Exposed	99	99	73	99	87	59	99	72	49	98	60	41	84	51	35	66	44	31	54	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
10	B	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	80	82	82	60	82	73	47	82	58	37	79	48	30	64	40	25	53	34	21
			Exposed	82	82	82	82	82	82	82	82	75	82	82	62	82	82	53	82	72	46	82	62	40	80	48	31	62	39	24	50	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	59	82	61	43	82	46	33	82	36	26	72	29	21	39	24	18
			Exposed	82	82	82	82	82	82	82	82	78	82	82	62	82	73	51	82	60	42	82	50	36	82	37	27	60	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	74	94	63	53	94	49	40	74	39	31	60	32	25			
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	91	94	83	72	94	69	58	94	50	41	72	38	30	56	30	23	45	24	19	37	20	15	32	17	13
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	77	97	87	59	97	68	47	95	55	38	69	45	31			
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	90	97	97	75	97	94	64	97	69	48	90	53	37	62	42	29	47	34	24	36	28	20	29	23	17
	C	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	71	82	82	60	82	80	51	82	69	44	82	54	34	70	43	27	56	35	22	46	29	18	38	24	16	32	21	14
			Exposed	82	82	59	82	77	49	82	65	41	82	56	35	79	48	31	68	42	27	60	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	73	82	82	59	82	69	49	82	58	41	82	42	30	82	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	82	82	58	82	66	46	82	53	38	82	44	32	82	37	27	82	31	23	50	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	87	94	80	69	94	57	47	82	43	34	63	34	26	50	27	21	41	22	17	34	18	14
			Exposed	94	94	94	94	92	81	94	73	62	94	60	49	94	50	40	80	42	34	68	36	29	51	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	86	97	97	72	97	79	54	97	60	41	74	47	33	54	38	27	42	31	22	33	26	18
			Exposed	97	97	97	97	97	82	97	97	67	97	82	56	97	69	47	97	58	40	83	50	35	55	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	82	82	82	82	82	75	82	82	62	82	82	52	82	70	45	82	61	39	82	53	34	67	42	26	53	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	82	70	45	82	59	37	82	50	32	70	43	27	60	37	24	52	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	82	82	82	82	82	78	82	82	62	82	72	50	82	58	41	82	49	35	82	41	30	81	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	82	58	41	82	47	33	82	38	28	82	32	23	52	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	95	95	95	95	95	95	95	95	95	95	95	90	95	81	70	95	67	56	95	56	46	79	42	33	60	32	25	47	25	19	38	20	16	32	17	13	28	15	12
			Exposed	95	80	69	95	64	53	95	52	42	82	43	35	69	37	29	59	31	24	50	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	98	98	98	98	98	98	98	98	98	98	98	88	98	98	73	98	91	62	98	77	53	97	58	40	68	44	31	50	35	25	38	29	20	30	24	17	24	20	15
			Exposed	98	98	73	98	87	59	98	72	49	98	60	41	84	51	35	66	44	31	54	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
20	B	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	68	47	68	58	37	68	48	30	64	40	25	53	34	21
			Exposed	68	68	68	68	68	68	68	68	68	68	68	62	68	68	53	68	68	46	68	62	40	68	48	31	62	39	24	50	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	61	43	68	46	33	68	36	26	68	29	21	39	24	18
			Exposed	68	68	68	68	68	68	68	68	68	68	68	62	68	68	51	68	60	42	68	50	36	68	37	27	60	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	74	83	63	53	83	49	40	74	39	31	60	32	25			
			Exposed	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	72	83	69	58	83	50	41	72	38	30	56	30	23	45	24	19	37	20	15	32	17	13
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	77	88	87	59	88	68	47	88	55	38	69	45	31			
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	75	88	88	64	88	69	48	88	53	37	62	42	29	47	34	24	36	28	20	29	23	17
	C	0-7	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	68	51	68	68	44	68	54	34	68	43	27	56	35	22	46	29	18	38	24	16	32	21	14
			Exposed	68	68	59	68	68	49	68	65	41	68	56	35	68	48	31	68	42	27	60	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	68	49	68	58	41	68	42	30	68	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	68	68	58	68	66	46	68	53	38	68	44	32	68	37	27	68	31	23	50	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	80	69	83	57	47	82	43	34	63	34	26	50	27	21	41	22	17	34	18	14
			Exposed	83	83	83	83	83	81	83	73	62	83	60	49	83	50	40	80	42	34	68	36	29	51	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	86	88	88	72	88	79	54	88	60	41	74	47	33	54	38	27	42	31	22	33	26	18
			Exposed	88	88	88	88	88	82	88	88	67	88	82	56	88	69	47	88	58	40	83	50	35	55	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	68	68	68	68	68	68	68	68	62	68	68	52	68	68	45	68	61	39	68	53	34	67	42	26	53	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	68	68	45	68	59	37	68	50	32	68	43	27	60	37	24	52	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	68	68	68	68	68	68	68	68	62	68	68	50	68	58	41	68	49	35	68	41	30	68	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	68	58	41	68	47	33	68	38	28	68	32	23	52	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	81	70	85	67	56	85	56	46	79	42	33	60	32	25	47	25	19	38	20	16	32	17	13	28	15	12
			Exposed	85	80	69	85	64	53	85	52	42	82	43	35	69	37	29	59	31	24	50	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	89	89	89	89	89	89	89	89	89	89	89	88	89	89	73	89	89	62	89	77	53	89	58	40	68	44	31	50	35	25	38	29	20	30	24	17	24	20	15
			Exposed	89	89	73	89	87	59	89	72	49	89	60	41	84	51	35	66	44	31	54	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	60	67	67	47	67	58	37	67	48	30	64	40	25	53	34	21
			Exposed	67	67	67	67	67	67	67	67	67	67	67	62	67	67	53	67	67	46	67	62	40	67	48	31	62	39	24	50	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	61	43	68	46	33	68	36	26	68	29	21	39	24	18
			Exposed	68	68	68	68	68	68	68	68	68	68	68	62	68	68	51	68	60	42	68	50	36	68	37	27	60	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	75	63	53	75	49	40	74	39	31	60	32	25			
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	69	58	75	50	41	72	38	30	56	30	23	45	24	19	37	20	15	32	17	13
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	59	77	68	47	77	55	38	69	45	31
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	75	77	77	64	77	69	48	77	53	37	62	42	29	47	34	24	36	28	20	29	23	17
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	60	67	67	51	67	67	44	67	54	34	67	43	27	56	35	22	46	29	18	38	24	16	32	21	14
			Exposed	67	67	59	67	67	49	67	65	41	67	56	35	67	48	31	67	42	27	60	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	68	49	68	58	41	68	42	30	68	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	68	68	58	68	66	46	68	53	38	68	44	32	68	37	27	68	31	23	50	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	69	75	57	47	75	43	34	63	34	26	50	27	21	41	22	17	34	18	14
			Exposed	75	75	75	75	75	75	75	73	62	75	60	49	75	50	40	75	42	34	68	36	29	51	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	72	77	77	54	77	60	41	74	47	33	54	38	27	42	31	22	33	26	18
			Exposed	77	77	77	77	77	77	77	77	67	77	77	56	77	69	47	77	58	40	77	50	35	55	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	68	68	68	68	68	68	68	68	62	68	68	52	68	68	45	68	61	39	68	53	34	67	42	26	53	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	68	68	45	68	59	37	68	50	32	68	43	27	60	37	24	52	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	68	68	68	68	68	68	68	68	62	68	68	50	68	58	41	68	49	35	68	41	30	68	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	68	58	41	68	47	33	68	38	28	68	32	23	52	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	70	78	67	56	78	56	46	78	42	33	60	32	25	47	25	19	38	20	16	32	17	13	28	15	12
			Exposed	78	78	69	78	64	53	78	52	42	78	43	35	69	37	29	59	31	24	50	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	73	82	82	62	82	77	53	82	58	40	68	44	31	50	35	25	38	29	20	30	24	17	24	20	15
			Exposed	82	82	73	82	82	59	82	72	49	82	60	41	82	51	35	66	44	31	54	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
40	B	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	47	61	58	37	61	48	30	61	40	25	53	34	21			
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	46	61	61	40	61	48	31	61	39	24	50	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	59	63	61	43	63	46	33	63	36	26	63	29	21	39	24	18			
			Exposed	63	63	63	63	63	63	63	63	63	63	63	62	63	63	51	63	60	42	63	50	36	63	37	27	60	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	40	64	39	31	60	32	25
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	58	64	50	41	64	38	30	56	30	23	45	24	19	37	20	15	32	17	13
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	60	60	47	60	55	38	60	45	31
			Exposed	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	48	60	53	37	60	42	29	47	34	24	36	28	20	29	23	17
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	51	61	61	44	61	54	34	61	43	27	56	35	22	46	29	18	38	24	16	32	21	14
			Exposed	61	61	59	61	61	49	61	61	41	61	56	35	61	48	31	61	42	27	60	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	59	63	63	49	63	58	41	63	42	30	63	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	63	63	58	63	63	46	63	53	38	63	44	32	63	37	27	63	31	23	50	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
			Exposed	64	64	64	64	64	64	64	64	62	64	60	49	64	50	40	64	42	34	64	36	29	51	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
			Exposed	60	60	60	60	60	60	60	60	60	60	60	56	60	60	47	60	58	40	60	50	35	55	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	63	63	63	63	63	63	63	63	62	63	63	52	63	63	45	63	61	39	63	53	34	63	42	26	53	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	63	63	45	63	59	37	63	50	32	63	43	27	60	37	24	52	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	65	65	65	65	65	65	65	65	62	65	65	50	65	58	41	65	49	35	65	41	30	65	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	65	58	41	65	47	33	65	38	28	65	32	23	52	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	67	56	70	56	46	70	42	33	60	32	25	47	25	19	38	20	16	32	17	13	28	15	12
			Exposed	70	70	69	70	64	53	70	52	42	70	43	35	69	37	29	59	31	24	50	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	62	66	66	53	66	58	40	66	44	31	50	35	25	38	29	20	30	24	17	24	20	15
			Exposed	66	66	66	66	66	59	66	66	49	66	60	41	66	51	35	66	44	31	54	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
50	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	48	30	55	40	25	53	34	21			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	46	55	55	40	55	48	31	55	39	24	50	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	43	57	46	33	57	36	26	57	29	21	39	24	18			
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	51	57	57	42	57	50	36	57	37	27	57	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	49	40	52	39	31	52	32	25
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	41	52	38	30	52	30	23	45	24	19	37	20	15	32	17	13
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	38	49	45	31
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	37	49	42	29	47	34	24	36	28	20	29	23	17			
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	44	55	54	34	55	43	27	55	35	22	46	29	18	38	24	16	32	21	14
			Exposed	55	55	55	55	55	49	55	55	41	55	55	35	55	48	31	55	42	27	55	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	49	57	57	41	57	42	30	57	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	57	57	57	57	57	46	57	53	38	57	44	32	57	37	27	57	31	23	50	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	43	34	52	34	26	50	27	21	41	22	17	34	18	14
			Exposed	52	52	52	52	52	52	52	52	52	52	52	49	52	50	40	52	42	34	52	36	29	51	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	41	49	47	33	49	38	27	42	31	22	33	26	18			
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	40	49	49	35	49	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	52	58	58	45	58	58	39	58	53	34	58	42	26	53	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	58	58	45	58	58	37	58	50	32	58	43	27	58	37	24	52	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	60	60	60	60	60	60	60	60	60	60	60	50	60	58	41	60	49	35	60	41	30	60	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	60	58	41	60	47	33	60	38	28	60	32	23	52	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	56	46	58	42	33	58	32	25	47	25	19	38	20	16	32	17	13	28	15	12
			Exposed	58	58	58	58	58	53	58	52	42	58	43	35	58	37	29	58	31	24	50	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	53	54	54	40	54	44	31	50	35	25	38	29	20	30	24	17	24	20	15
			Exposed	54	54	54	54	54	54	54	54	49	54	54	41	54	51	35	54	44	31	54	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	37	51	51	48	30	51	40	25	51	34	21
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	48	31	51	39	24	50	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	43	53	46	33	53	36	26	53	29	21	39	24	18
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	51	53	53	42	53	50	36	53	37	27	53	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	40	44	44	40	44	39	31	44	32	25
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	38	30	44	30	23	44	24	19	37	20	15	32	17	13
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	31
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	29	42	34	24	36	28	20	29	23	17
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	34	51	43	27	51	35	22	46	29	18	38	24	16	32	21	14
			Exposed	51	51	51	51	51	49	51	51	41	51	51	35	51	48	31	51	42	27	51	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	53	41	53	42	30	53	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	53	53	53	53	53	46	53	53	38	53	44	32	53	37	27	53	31	23	50	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	34	44	34	26	44	27	21	41	22	17	34	18	14
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	42	34	44	36	29	44	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	33	42	38	27	42	31	22	33	26	18			
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	35	42	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	52	53	53	45	53	53	39	53	53	34	53	42	26	53	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	53	53	45	53	53	37	53	50	32	53	43	27	53	37	24	52	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	50	55	55	41	55	49	35	55	41	30	55	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	55	55	41	55	47	33	55	38	28	55	32	23	52	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	42	33	49	32	25	47	25	19	38	20	16	32	17	13	28	15	12
			Exposed	49	49	49	49	49	49	49	49	42	49	43	35	49	37	29	49	31	24	49	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	44	31	46	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
70	B	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	37	47	47	30	47	40	25	47	34	21
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	47	47	40	47	47	31	47	39	24	47	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	31	38	32	25
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	30	38	30	23	38	24	19	37	20	15	32	17	13
		27-45	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	29	36	34	24	36	28	20	29	23	17
	C	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	34	47	43	27	47	35	22	46	29	18	38	24	16	32	21	14
			Exposed	47	47	47	47	47	47	47	47	41	47	47	35	47	47	31	47	42	27	47	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	26	38	27	21	38	22	17	34	18	14
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	29	38	27	21	38	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	27	36	31	22	33	26	18
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	36	27	36	30	21	31	24	17	24	20	15	19	17	13	17	15	11			
	D	0-7	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	45	49	49	39	49	49	34	49	42	26	49	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	49	49	45	49	49	37	49	49	32	49	43	27	49	37	24	49	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	51	51	51	51	51	51	51	51	51	51	51	50	51	51	41	51	49	35	51	41	30	51	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	51	51	41	51	47	33	51	38	28	51	32	23	51	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	33	42	32	25	42	25	19	38	20	16	32	17	13	28	15	12
			Exposed	42	42	42	42	42	42	42	42	42	42	42	35	42	42	37	42	42	27	42	42	27	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	31	40	35	25	38	29	20	30	24	17	24	20	15
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	31	40	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
80	B	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	37	44	44	30	44	40	25	44	34	21
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	31	44	39	24	44	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	33	41	36	26	41	29	21	39	24	18
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	36	41	37	27	41	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	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	34	34	34	34	34	34	32	34	32	25
			Exposed	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	30	34	30	23	34	24	19	34	20	15	32	17	13
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	24	32	28	20	29	23	17
	C	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	34	44	43	27	44	35	22	44	29	18	38	24	16	32	21	14
			Exposed	44	44	44	44	44	44	44	44	41	44	44	35	44	44	31	44	42	27	44	37	23	44	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	30	41	32	23	41	25	18	32	20	16	28	17	14	24	15	12
			Exposed	41	41	41	41	41	41	41	41	38	41	41	32	41	37	27	41	31	23	41	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	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	34	34	34	34	34	34	34	34	34	31
			Exposed	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	29	34	27	21	34	21	17	33	17	14	28	15	11
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	27	32	30	21	31	24	17	24	20	15	19	17	13
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	41	45	45	35	45	41	30	45	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	45	45	41	45	45	33	45	38	28	45	32	23	45	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	32	25	37	25	19	37	20	16	32	17	13	28	15	12
			Exposed	37	37	37	37	37	37	37	37	37	37	37	35	37	37	29	37	31	24	37	27	21	37	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	25	35	29	20	30	24	17	24	20	15
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	27	35	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9			

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	30	42	40	25	42	34	21
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	31	42	39	24	42	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	26	36	29	21	36	24	18
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	27	36	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	25
			Exposed	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	23	30	24	19	30	20	15	30	17	13
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	28	20	29	23	17
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	34	42	42	27	42	35	22	42	29	18	38	24	16	32	21	14
			Exposed	42	42	42	42	42	42	42	42	41	42	42	35	42	42	31	42	42	27	42	37	23	42	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	32	23	36	25	18	32	20	16	28	17	14	24	15	12
			Exposed	36	36	36	36	36	36	36	36	36	36	36	32	36	36	27	36	31	23	36	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	26	30	27	21	30	22	17	30	18	14
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	27	21	30	21	17	30	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	29	29	22	29	26	18
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	29	29	21	29	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	39	44	44	34	44	42	26	44	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	44	44	44	44	44	37	44	44	32	44	43	27	44	37	24	44	33	21	44	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	40	40	40	40	40	33	40	38	28	40	32	23	40	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	25	33	25	19	33	20	16	32	17	13	28	15	12
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	29	33	31	24	33	27	21	33	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	25	32	29	20	30	24	17	24	20	15
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	27	32	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
100	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	30	39	39	25	39	34	21
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	31	39	39	24	39	32	20	39	26	17	34	22	15	29	19	13
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	26	33	29	21	33	24	18
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	27	33	28	21	33	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	24	19	27	20	15	27	17	13
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	23	17
	C	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	27	39	35	22	39	29	18	38	24	16	32	21	14
			Exposed	39	39	39	39	39	39	39	39	39	39	39	35	39	39	31	39	39	27	39	37	23	39	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	32	23	33	25	18	32	20	16	28	17	14	24	15	12
			Exposed	33	33	33	33	33	33	33	33	33	33	33	32	33	33	27	33	31	23	33	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	27	27	21	27	22	17	27	18	14
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	21	27	21	17	27	17	14	27	15	11	24	13	10	21	12	8
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	22	26	26	18	26	26	18
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	21	26	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	34	42	42	26	42	33	21	42	27	17	35	23	15	30	19	13	25	17	12
			Exposed	42	42	42	42	42	37	42	42	32	42	42	27	42	37	24	42	33	21	42	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	30	36	31	23	36	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	36	36	36	36	36	33	36	36	28	36	32	23	36	27	20	36	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	25	30	25	19	30	20	16	30	17	13	28	15	12
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	24	30	27	21	30	21	16	30	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	25	29	29	20	29	24	17	24	20	15
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	29	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	134	136	136	123	136	136	116	136	125	104	136	113	91	128	104	73	116	94	60	107	78	49	100	66	42
			Exposed	136	136	134	136	136	121	136	136	113	136	128	106	136	119	99	136	112	90	132	106	78	117	95	60	106	76	48	97	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	123	136	135	115	136	116	103	136	104	85	136	91	66	113	71	52	101	57	42	76	47	35
			Exposed	136	136	136	136	136	121	136	129	112	136	118	104	136	110	98	136	103	83	136	97	71	114	73	53	100	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	133	122	137	116	109	137	106	99	122	97	78	113	77	61	104	63	50
			Exposed	137	137	137	137	137	137	137	137	137	137	136	126	137	123	116	137	115	108	137	109	102	123	97	80	111	75	59	101	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	127	138	134	113	138	119	103	131	109	92	117	100	74	107	88	62
			Exposed	138	138	138	138	138	138	138	138	138	138	138	129	138	138	119	138	132	112	138	122	106	133	110	93	115	99	72	104	82	58	92	66	47	71	55	39	57	46	33
	C	0-7	Interior	136	136	136	136	136	129	136	136	118	136	135	111	136	125	104	136	117	98	136	111	87	122	100	67	111	84	53	102	68	43	89	57	36	74	48	31	63	41	28
			Exposed	136	125	104	136	116	96	136	108	81	125	102	70	117	94	60	110	83	52	104	73	46	91	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	136	136	136	136	136	130	136	136	118	136	124	110	136	116	102	136	108	95	136	102	80	122	82	60	106	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	136	115	102	136	107	91	136	99	74	136	86	62	114	72	53	105	61	45	97	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	132	122	137	121	114	137	114	107	131	102	92	116	85	68	106	66	52	97	53	41	81	44	34	67	36	29
			Exposed	137	132	121	137	119	112	137	111	104	134	103	96	123	97	79	116	83	66	109	71	56	98	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	126	138	138	118	138	130	111	138	115	100	121	104	81	109	92	64	100	74	52	82	61	43	65	51	36
			Exposed	138	138	126	138	138	116	138	125	108	138	116	101	133	109	93	120	103	79	113	97	69	100	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	136	136	122	136	136	113	136	127	106	136	118	99	136	111	88	131	105	76	122	100	66	110	82	52	100	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	136	111	87	128	104	73	119	97	62	111	84	53	105	73	46	99	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	136	136	121	136	129	112	136	117	104	136	109	97	136	102	81	136	96	69	121	81	59	104	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	136	102	81	136	91	66	116	75	55	106	63	46	98	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	137	137	137	137	137	137	137	136	125	137	122	115	137	114	107	137	107	101	130	101	90	115	82	65	104	63	49	92	50	38	75	40	32	63	34	27	55	30	23
			Exposed	137	114	107	137	106	99	125	98	83	117	85	68	109	72	57	103	62	48	98	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	138	138	138	138	138	138	138	138	129	138	138	119	138	131	111	138	121	105	138	114	99	119	102	78	107	87	61	97	69	49	74	56	40	59	47	33	48	39	29
			Exposed	138	130	111	138	119	103	137	111	96	121	104	81	113	98	70	106	85	60	100	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
10	B	0-7	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	104	114	114	104	114	114	104	114	113	91	114	104	73	114	94	60	107	78	49	100	66	42
			Exposed	114	114	114	114	114	114	114	114	113	114	114	106	114	114	99	114	112	90	114	106	78	114	95	60	106	76	48	97	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	103	115	104	85	115	91	66	113	71	52	101	57	42	76	47	35
			Exposed	115	115	115	115	115	115	115	115	112	115	115	104	115	110	98	115	103	83	115	97	71	114	73	53	100	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	122	131	116	109	131	106	99	122	97	78	113	77	61	104	63	50
			Exposed	131	131	131	131	131	131	131	131	131	131	131	126	131	123	116	131	115	108	131	109	102	123	97	80	111	75	59	101	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	127	136	134	113	136	119	103	131	109	92	117	100	74	107	88	62
			Exposed	136	136	136	136	136	136	136	136	136	136	136	129	136	136	119	136	132	112	136	122	106	133	110	93	115	99	72	104	82	58	92	66	47	71	55	39	57	46	33
	C	0-7	Interior	114	114	114	114	114	114	114	114	114	114	114	111	114	114	104	114	114	98	114	111	87	114	100	67	111	84	53	102	68	43	89	57	36	74	48	31	63	41	28
			Exposed	114	114	104	114	114	96	114	108	81	114	102	70	114	94	60	110	83	52	104	73	46	91	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	115	115	115	115	115	115	115	115	115	115	115	110	115	115	102	115	108	95	115	102	80	115	82	60	106	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	115	115	102	115	107	91	115	99	74	115	86	62	114	72	53	105	61	45	97	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	122	131	116	109	131	106	99	122	97	78	113	77	61	104	63	50
			Exposed	131	131	121	131	119	112	131	111	104	131	103	96	123	97	79	116	83	66	109	71	56	98	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	126	136	136	118	136	130	111	136	115	100	121	104	81	109	92	64	100	74	52	82	61	43	65	51	36
			Exposed	136	136	126	136	136	116	136	125	108	136	116	101	133	109	93	120	103	79	113	97	69	100	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	114	114	114	114	114	113	114	114	106	114	114	99	114	111	88	114	105	76	114	100	66	110	82	52	100	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	114	111	87	114	104	73	114	97	62	111	84	53	105	73	46	99	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	115	115	115	115	115	112	115	115	104	115	109	97	115	102	81	115	96	69	115	81	59	104	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	115	102	81	115	91	66	115	75	55	106	63	46	98	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	133	133	133	133	133	133	133	133	125	133	122	115	133	114	107	133	107	101	130	101	90	115	82	65	104	63	49	92	50	38	75	40	32	63	34	27	55	30	23
			Exposed	133	114	107	133	106	99	125	98	83	117	85	68	109	72	57	103	62	48	98	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	137	137	137	137	137	137	137	137	129	137	137	119	137	131	111	137	121	105	137	114	99	119	102	78	107	87	61	97	69	49	74	56	40	59	47	33	48	39	29
			Exposed	137	130	111	137	119	103	137	111	96	121	104	81	113	98	70	106	85	60	100	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
20	B	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	91	95	95	73	95	94	60	95	78	49	95	66	42
			Exposed	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	90	95	95	78	95	95	60	95	76	48	95	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	85	96	71	52	96	57	42	76	47	35			
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	83	96	96	71	96	73	53	96	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	109	116	106	99	116	97	78	113	77	61	104	63	50			
			Exposed	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	108	116	109	102	116	97	80	111	75	59	101	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	113	123	119	103	123	109	92	117	100	74	107	88	62			
			Exposed	123	123	123	123	123	123	123	123	123	123	123	123	123	123	119	123	123	112	123	122	106	123	110	93	115	99	72	104	82	58	92	66	47	71	55	39	57	46	33
	C	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	87	95	95	67	95	84	53	95	68	43	89	57	36	74	48	31	63	41	28
			Exposed	95	95	95	95	95	95	95	95	81	95	95	70	95	94	60	95	83	52	95	73	46	91	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	96	96	80	96	82	60	96	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	96	96	96	96	96	91	96	96	74	96	86	62	96	72	53	96	61	45	96	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	114	116	114	107	116	102	92	116	85	68	106	66	52	97	53	41	81	44	34	67	36	29		
			Exposed	116	116	116	116	116	112	116	111	104	116	103	96	116	97	79	116	83	66	109	71	56	98	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	118	123	123	111	123	115	100	121	104	81	109	92	64	100	74	52	82	61	43	65	51	36
			Exposed	123	123	123	123	123	116	123	123	108	123	116	101	123	109	93	120	103	79	113	97	69	100	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	88	95	95	76	95	95	66	95	82	52	95	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	95	95	87	95	95	73	95	95	62	95	84	53	95	73	46	95	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	81	96	96	69	96	81	59	96	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	96	96	81	96	91	66	96	75	55	96	63	46	96	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	119	119	119	119	119	119	119	119	119	119	119	115	119	114	107	119	107	101	119	101	90	115	82	65	104	63	49	92	50	38	75	40	32	63	34	27	55	30	23
			Exposed	119	114	107	119	106	99	119	98	83	117	85	68	109	72	57	103	62	48	98	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	125	125	125	125	125	125	125	125	125	125	125	119	125	125	111	125	121	105	125	114	99	119	102	78	107	87	61	97	69	49	74	56	40	59	47	33	48	39	29
			Exposed	125	125	111	125	119	103	125	111	96	121	104	81	113	98	70	106	85	60	100	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	91	94	94	73	94	94	60	94	78	49	94	66	42
			Exposed	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	90	94	94	78	94	94	60	94	76	48	94	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	85	96	91	66	96	71	52	96	57	42	76	47	35
			Exposed	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	83	96	96	71	96	73	53	96	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	99	106	97	78	106	77	61	104	63	50
			Exposed	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	102	106	97	80	106	75	59	101	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	103	113	109	92	113	100	74	107	88	62
			Exposed	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	112	113	113	106	113	110	93	113	99	72	104	82	58	92	66	47	71	55	39	57	46	33
	C	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	87	94	94	67	94	84	53	94	68	43	89	57	36	74	48	31	63	41	28
			Exposed	94	94	94	94	94	94	94	94	81	94	94	70	94	94	60	94	83	52	94	73	46	91	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	96	96	80	96	82	60	96	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	96	96	96	96	96	91	96	96	74	96	86	62	96	72	53	96	61	45	96	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	102	92	106	85	68	106	66	52	97	53	41	81	44	34	67	36	29
			Exposed	106	106	106	106	106	106	106	106	104	106	103	96	106	97	79	106	83	66	106	71	56	98	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	111	113	113	100	113	104	81	109	92	64	100	74	52	82	61	43	65	51	36
			Exposed	113	113	113	113	113	113	113	113	108	113	113	101	113	109	93	113	103	79	113	97	69	100	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	88	95	95	76	95	95	66	95	82	52	95	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	95	95	87	95	95	73	95	95	62	95	84	53	95	73	46	95	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	81	96	96	69	96	81	59	96	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	96	96	81	96	91	66	96	75	55	96	63	46	96	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	107	108	107	101	108	101	90	108	82	65	104	63	49	92	50	38	75	40	32	63	34	27	55	30	23
			Exposed	108	108	107	108	106	99	108	98	83	108	85	68	108	72	57	103	62	48	98	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	111	115	115	105	115	114	99	115	102	78	107	87	61	97	69	49	74	56	40	59	47	33	48	39	29
			Exposed	115	115	111	115	115	103	115	111	96	115	104	81	113	98	70	106	85	60	100	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
40	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	73	85	85	60	85	78	49	85	66	42
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	85	60	85	76	48	85	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	88	85	88	88	66	88	71	52	88	57	42	76	47	35
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	83	88	88	71	88	73	53	88	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	78	97	77	61	97	63	50
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	80	97	75	59	97	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	103	105	105	92	105	100	74	103	88	62
			Exposed	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	93	105	99	72	104	82	58	92	66	47	71	55	39	57	46	33
	C	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	67	85	84	53	85	68	43	85	57	36	74	48	31	63	41	28
			Exposed	85	85	85	85	85	85	85	85	81	85	85	70	85	85	60	85	83	52	85	73	46	85	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	80	88	82	60	88	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	88	88	88	88	88	88	88	88	74	88	86	62	88	72	53	88	61	45	88	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	92	97	85	68	97	66	52	97	53	41	81	44	34	67	36	29
			Exposed	97	97	97	97	97	97	97	97	97	97	97	96	97	97	79	97	83	66	97	71	56	97	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	100	105	104	81	103	92	64	100	74	52	82	61	43	65	51	36
			Exposed	105	105	105	105	105	105	105	105	101	105	105	101	105	105	93	105	103	79	105	97	69	100	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	76	88	88	66	88	82	52	88	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	88	88	87	88	88	73	88	88	62	88	84	53	88	73	46	88	64	41	88	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	81	91	91	69	91	81	59	91	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	91	91	81	91	91	66	91	75	55	91	63	46	91	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	90	100	82	65	100	63	49	92	50	38	75	40	32	63	34	27	55	30	23
			Exposed	100	100	100	100	100	99	100	98	83	100	85	68	100	72	57	100	62	48	98	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	105	108	108	99	108	102	78	106	87	61	97	69	49	74	56	40	59	47	33	48	39	29
			Exposed	108	108	108	108	108	103	108	108	96	108	104	81	108	98	70	106	85	60	100	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
50	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	60	77	77	49	77	66	42
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	60	77	76	48	77	62	39	77	52	33	67	43	29	57	37	26
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	66	80	71	52	80	57	42	76	47	35
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	71	80	73	53	80	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	78	91	77	61	91	63	50
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	80	91	75	59	91	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	92	97	97	74	96	88	62
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	93	97	97	72	97	82	58	92	66	47	71	55	39	57	46	33
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	67	77	77	53	77	68	43	77	57	36	74	48	31	63	41	28
			Exposed	77	77	77	77	77	77	77	77	77	77	77	70	77	77	60	77	77	52	77	73	46	77	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	60	80	63	46	80	49	36	63	40	31	54	33	28	47	30	24
			Exposed	80	80	80	80	80	80	80	80	74	80	80	62	80	72	53	80	61	45	80	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	85	91	85	68	91	66	52	91	53	41	81	44	34	67	36	29
			Exposed	91	91	91	91	91	91	91	91	91	91	91	91	91	91	79	91	83	66	91	71	56	91	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	81	97	92	64	94	74	52	82	61	43	65	51	36			
			Exposed	97	97	97	97	97	97	97	97	97	97	97	97	97	97	93	97	97	79	97	97	69	97	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76	81	81	66	81	81	52	81	66	41	81	54	34	69	45	30	58	38	26	49	33	23
			Exposed	81	81	81	81	81	73	81	81	62	81	81	53	81	73	46	81	64	41	81	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	69	84	81	59	84	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	84	84	81	84	84	66	84	75	55	84	63	46	84	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	90	94	82	65	94	63	49	92	50	38	75	40	32	63	34	27	55	30	23
			Exposed	94	94	94	94	94	94	94	94	83	94	85	68	94	72	57	94	62	48	94	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	99	101	101	78	99	87	61	96	69	49	74	56	40	59	47	33	48	39	29
			Exposed	101	101	101	101	101	101	101	101	96	101	101	81	101	98	70	101	85	60	100	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	60	71	71	49	71	66	42
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	60	71	71	48	71	62	39	71	52	33	67	43	29	57	37	26
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	66	74	71	52	74	57	42	74	47	35
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	73	53	74	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	77	61	85	63	50
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	75	59	85	59	46	85	48	37	72	39	31	62	33	26
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	74	82	82	62
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	72	82	82	58	82	66	47	71	55	39	57	46	33			
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	53	71	68	43	71	57	36	71	48	31	63	41	28
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	60	71	71	52	71	71	46	71	58	36	71	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	60	74	63	46	74	49	36	63	40	31	54	33	28	47	30	24
			Exposed	74	74	74	74	74	74	74	74	74	74	74	62	74	72	53	74	61	45	74	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	68	85	66	52	85	53	41	81	44	34	67	36	29			
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	83	66	85	71	56	85	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	81	82	82	64	82	74	52	82	61	43	65	51	36			
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	69	82	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	66	74	74	52	74	66	41	74	54	34	69	45	30	58	38	26	49	33	23
			Exposed	74	74	74	74	74	73	74	74	62	74	74	53	74	73	46	74	64	41	74	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	69	78	78	59	78	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	78	78	78	78	78	66	78	75	55	78	63	46	78	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	82	65	88	63	49	88	50	38	75	40	32	63	34	27	55	30	23
			Exposed	88	88	88	88	88	88	88	88	83	88	85	68	88	72	57	88	62	48	88	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	78	91	87	61	91	69	49	74	56	40	59	47	33	48	39	29
			Exposed	91	91	91	91	91	91	91	91	91	91	91	81	91	91	70	91	85	60	91	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
70	B	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	60	66	66	49	66	66	42
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	60	66	66	48	66	62	39	66	52	33	66	43	29	57	37	26
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66	69	69	52	69	57	42	69	47	35
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	53	69	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	61	75	63	50
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	59	75	59	46	75	48	37	72	39	31	62	33	26
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	62
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	58	72	66	47	71	55	39	57	46	33
	C	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	53	66	66	43	66	57	36	66	48	31	63	41	28
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	60	66	66	52	66	66	46	66	58	36	66	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	60	69	63	46	69	49	36	63	40	31	54	33	28	47	30	24
			Exposed	69	69	69	69	69	69	69	69	69	69	69	62	69	69	53	69	61	45	69	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	66	52	75	53	41	75	44	34	67	36	29			
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	66	75	71	56	75	54	42	75	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	64	72	72	52	72	61	43	65	51	36
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	53	72	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66	69	69	52	69	66	41	69	54	34	69	45	30	58	38	26	49	33	23
			Exposed	69	69	69	69	69	69	69	69	62	69	69	53	69	69	46	69	64	41	69	57	36	69	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	59	72	60	44	72	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	72	72	72	72	72	66	72	72	55	72	63	46	72	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	65	83	63	49	83	50	38	75	40	32	63	34	27	55	30	23
			Exposed	83	83	83	83	83	83	83	83	83	83	83	68	83	72	57	83	62	48	83	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	61	79	69	49	74	56	40	59	47	33	48	39	29
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	70	79	79	60	79	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	49	62	62	42
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	48	62	62	39	62	52	33	62	43	29	57	37	26
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	52	64	57	42	64	47	35
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	53	64	56	41	64	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	63	50
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	59	66	59	46	66	48	37	66	39	31	62	33	26
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	47	63	55	39	57	46	33
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	53	62	62	43	62	57	36	62	48	31	62	41	28
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	52	62	62	46	62	58	36	62	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	63	46	64	49	36	63	40	31	54	33	28	47	30	24
			Exposed	64	64	64	64	64	64	64	64	64	64	64	62	64	64	53	64	61	45	64	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	52	66	66	53	66	44	34	66	36	29
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	56	66	54	42	66	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	52	63	61	43	63	51	36
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	41	65	54	34	65	45	30	58	38	26	49	33	23
			Exposed	65	65	65	65	65	65	65	65	62	65	65	53	65	65	46	65	64	41	65	57	36	65	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	60	44	68	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	68	68	68	68	68	66	68	68	55	68	63	46	68	53	39	68	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	65	73	63	49	73	50	38	73	40	32	63	34	27	55	30	23
			Exposed	73	73	73	73	73	73	73	73	73	73	73	68	73	72	57	73	62	48	73	53	41	73	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	61	70	69	49	70	56	40	59	47	33	48	39	29
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	60	70	70	52	70	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	58	42			
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	48	58	58	39	58	52	33	58	43	29	57	37	26
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	57	42	61	47	35
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	56	41	61	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	50
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	46	59	48	37	59	39	31	59	33	26
		27-45	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	47	57	55	39	57	46	33
	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	43	58	57	36	58	48	31	58	41	28
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	46	58	58	36	58	47	31	58	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	46	61	49	36	61	40	31	54	33	28	47	30	24
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	45	61	53	39	61	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	52	59	53	41	59	44	34	59	36	29						
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	56	59	54	42	59	42	33	59	34	27	55	30	23	47	26	19	41	23	17			
		27-45	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	52	57	57	43	57	51	36
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	42	57	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	61	41	61	54	34	61	45	30	58	38	26	49	33	23
			Exposed	61	61	61	61	61	61	61	61	61	61	61	53	61	61	46	61	61	41	61	57	36	61	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	59	64	60	44	64	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	64	64	64	64	64	64	64	64	55	64	63	46	64	53	39	64	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	66	63	49	66	50	38	66	40	32	63	34	27	55	30	23
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	57	66	62	48	66	53	41	66	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	61	63	63	49	63	56	40	59	47	33	48	39	29
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	60	63	63	52	63	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
100	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	42
			Exposed	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	48	55	55	39	55	52	33	55	43	29	55	37	26
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	57	42	58	47	35
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	56	41	58	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	50
			Exposed	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	46	54	48	37	54	39	31	54	33	26
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	39	51	46	33
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	43	55	55	36	55	48	31	55	41	28
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	46	55	55	36	55	47	31	55	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	46	58	49	36	58	40	31	54	33	28	47	30	24
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	45	58	53	39	58	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	36
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	42	54	42	33	54	34	27	54	30	23	47	26	19	41	23	17
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	43	51	51	36
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	42	51	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	41	58	54	34	58	45	30	58	38	26	49	33	23
			Exposed	58	58	58	58	58	58	58	58	58	58	58	53	58	58	46	58	58	41	58	57	36	58	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	60	44	61	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	61	61	61	61	61	61	61	61	55	61	61	46	61	53	39	61	46	34	61	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	49	59	50	38	59	40	32	59	34	27	55	30	23
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	57	59	59	48	59	53	41	59	41	32	59	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	49	57	56	40	57	47	33	48	39	29
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	52	57	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	40	55	43	32	55	35	26	46	29	21						
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	43	55	44	32	55	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	37	55	38	30
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	46	36	55	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	53	37
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	50	35	55	40	28	44	33	24	35	28	20			
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	50	36	55	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	55	55	55	55	55	55	55	55	45	55	52	38	55	44	32	55	37	27	55	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	41	55	52	41	55	40	32	55	32	25	49	26	20	41	22	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	50	40	55	43	34	55	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	45	32	50	37	26	40	31	22			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13			
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	50	31	55	40	25	51	33	21	42	27	18	35	23	16	30	20	14	
			Exposed	55	55	53	55	55	45	55	55	38	55	51	33	55	45	28	55	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	40	55	38	30	55	30	23	45	24	19	38	20	16	33	18	14
			Exposed	55	55	55	55	55	55	55	55	50	55	52	41	55	44	34	55	37	29	55	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
10	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	40	55	43	32	55	35	26	46	29	21						
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	43	55	44	32	55	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	37	55	38	30
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	46	36	55	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	53	37
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	50	35	55	40	28	44	33	24	35	28	20			
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	50	36	55	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	55	55	55	55	55	55	55	55	45	55	52	38	55	44	32	55	37	27	55	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	41	55	52	41	55	40	32	55	32	25	49	26	20	41	22	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	50	40	55	43	34	55	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	45	32	50	37	26	40	31	22			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13			
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	50	31	55	40	25	51	33	21	42	27	18	35	23	16	30	20	14	
			Exposed	55	55	53	55	55	45	55	55	38	55	51	33	55	45	28	55	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	40	55	38	30	55	30	23	45	24	19	38	20	16	33	18	14
			Exposed	55	55	55	55	55	55	55	55	50	55	52	41	55	44	34	55	37	29	55	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
20	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	40	55	43	32	55	35	26	46	29	21						
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	43	55	44	32	55	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	37	55	38	30
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	46	36	55	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	53	37
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	50	35	55	40	28	44	33	24	35	28	20			
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	50	36	55	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	55	55	55	55	55	55	55	55	45	55	52	38	55	44	32	55	37	27	55	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	41	55	52	41	55	40	32	55	32	25	49	26	20	41	22	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	50	40	55	43	34	55	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	45	32	50	37	26	40	31	22			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13			
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	50	31	55	40	25	51	33	21	42	27	18	35	23	16	30	20	14	
			Exposed	55	55	53	55	55	45	55	55	38	55	51	33	55	45	28	55	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	40	55	38	30	55	30	23	45	24	19	38	20	16	33	18	14
			Exposed	55	55	55	55	55	55	55	55	50	55	52	41	55	44	34	55	37	29	55	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	40	55	43	32	55	35	26	46	29	21
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	43	55	44	32	55	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	37	55	38	30
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	46	36	55	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	53	37
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	50	35	55	40	28	44	33	24	35	28	20
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	50	36	55	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	55	55	55	55	55	55	55	55	45	55	52	38	55	44	32	55	37	27	55	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	41	55	52	41	55	40	32	55	32	25	49	26	20	41	22	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	50	40	55	43	34	55	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	45	32	50	37	26	40	31	22			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13			
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	50	31	55	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	55	55	53	55	55	45	55	55	38	55	51	33	55	45	28	55	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	40	55	38	30	55	30	23	45	24	19	38	20	16	33	18	14
			Exposed	55	55	55	55	55	55	55	55	50	55	52	41	55	44	34	55	37	29	55	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
40	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	40	55	43	32	55	35	26	46	29	21
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	43	55	44	32	55	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	37	55	38	30
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	46	36	55	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	53	37
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	50	35	55	40	28	44	33	24	35	28	20
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	50	36	55	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	55	55	55	55	55	55	55	55	45	55	52	38	55	44	32	55	37	27	55	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	41	55	52	41	55	40	32	55	32	25	49	26	20	41	22	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	50	40	55	43	34	55	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	45	32	50	37	26	40	31	22			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13			
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	50	31	55	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	55	55	53	55	55	45	55	55	38	55	51	33	55	45	28	55	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	40	55	38	30	55	30	23	45	24	19	38	20	16	33	18	14
			Exposed	55	55	55	55	55	55	55	55	50	55	52	41	55	44	34	55	37	29	55	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
50	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	40	55	43	32	55	35	26	46	29	21
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	43	55	44	32	55	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	37	55	38	30
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	46	36	55	36	28	54	29	22	44	24	19	38	20	16
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	45	55	53	37
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	50	35	55	40	28	44	33	24	35	28	20
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	50	36	55	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	55	55	55	55	55	55	55	55	45	55	52	38	55	44	32	55	37	27	55	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	41	55	52	41	55	40	32	55	32	25	49	26	20	41	22	17
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	50	40	55	43	34	55	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	39	55	45	32	50	37	26	40	31	22			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13			
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	50	31	55	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	55	55	53	55	55	45	55	55	38	55	51	33	55	45	28	55	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	40	55	38	30	55	30	23	45	24	19	38	20	16	33	18	14
			Exposed	55	55	55	55	55	55	55	55	50	55	52	41	55	44	34	55	37	29	55	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	44	55	55	36	55	47	30	55	40	25
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	55	37	55	46	29	55	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	40	55	43	32	55	35	26	46	29	21			
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	43	55	44	32	55	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	47	37	53	38	30			
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	46	36	53	36	28	53	29	22	44	24	19	38	20	16
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	37			
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	44	50	50	35	50	40	28	44	33	24	35	28	20
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	41	55	51	32	55	42	26	54	35	22	45	29	19	38	25	17
			Exposed	55	55	55	55	55	55	55	55	50	55	55	42	55	55	37	55	50	32	55	44	28	55	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	50	36	55	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	55	55	55	55	55	55	55	55	45	55	52	38	55	44	32	55	37	27	55	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	41	53	40	32	53	32	25	49	26	20	41	22	17			
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	50	40	53	43	34	53	33	25	48	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	39	50	45	32	50	37	26	40	31	22			
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	42	50	46	32	48	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	50	31	55	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	55	55	53	55	55	45	55	55	38	55	51	33	55	45	28	55	39	25	55	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	40	55	38	30	55	30	23	45	24	19	38	20	16	33	18	14
			Exposed	55	55	55	55	55	55	55	55	50	55	52	41	55	44	34	55	37	29	55	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	53	37	55	42	30	45	34	24	36	28	20	29	24	18
			Exposed	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	52	37	55	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
70	B	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	36	51	47	30	51	40	25
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	37	51	46	29	51	38	24	49	31	20	41	26	18	35	22	16
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	52	54	54	40	54	43	32	54	35	26	46	29	21			
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	43	54	44	32	54	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	38	30
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	36	46	36	28	46	29	22	44	24	19	38	20	16
		27-45	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	37			
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	35	44	40	28	44	33	24	35	28	20
	C	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	41	51	51	32	51	42	26	51	35	22	45	29	19	38	25	17
			Exposed	51	51	51	51	51	51	51	51	50	51	51	42	51	51	37	51	50	32	51	44	28	51	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	50	36	54	38	28	51	30	22	39	24	19	33	20	17	29	18	15
			Exposed	54	54	54	54	54	54	54	54	45	54	52	38	54	44	32	54	37	27	54	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	40	32	46	32	25	46	26	20	41	22	17			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	43	34	46	33	25	46	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	39	44	44	32	44	37	26	40	31	22
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	32	44	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	50	31	54	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	54	54	53	54	54	45	54	54	38	54	51	33	54	45	28	54	39	25	54	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	50	55	55	42	55	49	36	55	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	55	55	49	55	55	40	55	46	33	55	38	28	55	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	40	51	38	30	51	30	23	45	24	19	38	20	16	33	18	14
			Exposed	51	51	51	51	51	51	51	51	50	51	51	41	51	44	34	51	37	29	51	32	25	46	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	37	48	42	30	45	34	24	36	28	20	29	24	18
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	48	37	48	45	32	46	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
80	B	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	44	48	48	36	48	47	30	48	40	25
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	47	48	48	37	48	46	29	48	38	24	48	31	20	41	26	18	35	22	16
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	40	49	43	32	49	35	26	46	29	21
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	43	49	44	32	49	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	38	30
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	36	28	40	29	22	40	24	19	38	20	16
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	28	39	33	24	35	28	20
	C	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	41	48	48	32	48	42	26	48	35	22	45	29	19	38	25	17
			Exposed	48	48	48	48	48	48	48	48	48	48	48	42	48	48	37	48	48	32	48	44	28	48	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	36	49	38	28	49	30	22	39	24	19	33	20	17	29	18	15
			Exposed	49	49	49	49	49	49	49	49	45	49	49	38	49	44	32	49	37	27	49	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	32	40	40	25	40	26	20	40	22	17
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	33	25	40	26	20	39	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	39	25	39	31	22			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	36	25	37	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	50	31	51	40	25	51	33	21	42	27	18	35	23	16	30	20	14
			Exposed	51	51	51	51	51	45	51	51	38	51	51	33	51	45	28	51	39	25	51	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	42	53	49	36	53	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	53	53	49	53	53	40	53	46	33	53	38	28	53	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	38	30	45	30	23	45	24	19	38	20	16	33	18	14
			Exposed	45	45	45	45	45	45	45	45	45	45	45	41	45	44	34	45	37	29	45	32	25	45	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	42	30	43	34	24	36	28	20	29	24	18
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	37	43	43	32	43	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	36	46	46	30	46	40	25
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	29	46	38	24	46	31	20	41	26	18	35	22	16
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	43	32	44	35	26	44	29	21
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	32	44	34	25	42	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	28	36	29	22	36	24	19	36	20	16
		27-45	Interior	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	34	34	34	34	34	34	34	34	34	34
			Exposed	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	34	34	34	34	34	34	34	34	28	20
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	32	46	42	26	46	35	22	45	29	19	38	25	17
			Exposed	46	46	46	46	46	46	46	46	46	46	46	42	46	46	37	46	46	32	46	44	28	46	35	22	44	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	36	44	38	28	44	30	22	39	24	19	33	20	17	29	18	15
			Exposed	44	44	44	44	44	44	44	44	44	44	44	38	44	44	32	44	37	27	44	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	32	25	36	26	20	36	22	17	36	24	19	36	20	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	33	25	36	26	20	36	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	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	34	34	34	34	34	34	34	34	31	22
			Exposed	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	25	34	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	48	31	48	40	25	48	33	21	42	27	18	35	23	16	30	20	14
			Exposed	48	48	48	48	48	45	48	48	38	48	48	33	48	45	28	48	39	25	48	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	42	48	48	36	48	37	27	46	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	48	48	48	48	48	40	48	46	33	48	38	28	48	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	30	40	30	23	40	24	19	38	20	16	33	18	14
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	37	29	40	32	25	40	25	19	38	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	30	38	34	24	36	28	20	29	24	18
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	32	38	35	25	35	28	20	27	22	17	22	19	14	19	17	12	17	15	11
100	B	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	30	43	40	25
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	29	43	38	24	43	31	20	41	26	18	35	22	16
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	35	26	39	29	21
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	34	25	39	27	20	35	22	18	30	19	16	26	17	14
		20-27	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30
			Exposed	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	28	33	29	22	33	24	19	33	20	16
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	24	31	28	20
	C	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	32	43	42	26	43	35	22	43	29	19	38	25	17
			Exposed	43	43	43	43	43	43	43	43	43	43	43	42	43	43	37	43	43	32	43	43	28	43	35	22	43	28	19	36	23	16	30	20	14	25	17	12	21	15	11
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	38	28	39	30	22	39	24	19	33	20	17	29	18	15
			Exposed	39	39	39	39	39	39	39	39	39	39	39	38	39	39	32	39	37	27	39	32	24	39	24	19	32	20	16	27	17	14	23	15	12	20	13	11	18	12	10
		20-27	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	25	33	26	20	33	22	17
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	25	33	26	20	33	21	16	33	18	14	29	16	12	25	14	10
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	31	22
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	25	31	29	21	29	24	18	23	20	15	20	18	13
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	40	25	46	33	21	42	27	18	35	23	16	30	20	14
			Exposed	46	46	46	46	46	45	46	46	38	46	46	33	46	45	28	46	39	25	46	35	22	43	28	18	34	22	16	28	19	13	23	17	12	20	15	10	18	13	9
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	36	44	37	27	44	28	21	37	23	18	31	19	16	27	17	14	23	15	12
			Exposed	44	44	44	44	44	40	44	44	33	44	38	28	44	32	24	44	28	21	39	24	19	32	19	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	30	23	36	24	19	36	20	16	33	18	14
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	29	36	32	25	36	25	19	36	20	16	32	17	13	27	15	11	23	13	9	20	12	8
		27-45	Interior	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	30	34	34	24	34	28	20	29	24	18
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	25	34	28	20	27	22	17	22	19	14	19	17	12	17	15	11

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	75	92	92	61	92	80	50	92	67	42
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	92	62	92	78	49	92	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	92	67	92	73	53	92	59	43	78	48	36			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	85	92	92	72	92	74	54	92	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	79	63	92	65	51			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	77	61	92	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	76	92	90	63
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	84	59	92	68	48	73	56	40	59	47	34
	C	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	89	92	92	69	92	86	55	92	70	44	91	58	36	76	49	32	64	42	28
			Exposed	92	92	92	92	92	92	92	92	83	92	92	71	92	92	61	92	84	54	92	74	47	92	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	82	92	84	61	92	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	92	92	92	92	92	92	92	92	76	92	88	63	92	74	54	92	63	46	92	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	69	92	68	53	92	54	42	82	45	34	69	37	29
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	85	68	92	73	57	92	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	66	92	76	53	84	62	44	67	52	37			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	92	70	92	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	92	78	92	92	68	92	83	53	92	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	92	92	89	92	92	75	92	92	64	92	86	55	92	75	47	92	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	70	92	83	60	92	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	92	92	82	92	92	67	92	77	56	92	64	47	92	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	66	92	64	50	92	51	39	76	41	32	64	34	27	56	31	23
			Exposed	92	92	92	92	92	92	92	92	85	92	87	69	92	73	58	92	63	49	92	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	92	92	92	92	92	92	92	92	92	92	92	83	92	92	71	92	87	61	92	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
10	B	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	75	92	92	61	92	80	50	92	67	42
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	92	62	92	78	49	92	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	92	67	92	73	53	92	59	43	78	48	36			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	85	92	92	72	92	74	54	92	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	79	63	92	65	51			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	77	61	92	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	76	92	90	63
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	84	59	92	68	48	73	56	40	59	47	34
	C	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	89	92	92	69	92	86	55	92	70	44	91	58	36	76	49	32	64	42	28
			Exposed	92	92	92	92	92	92	92	92	83	92	92	71	92	92	61	92	84	54	92	74	47	92	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	82	92	84	61	92	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	92	92	92	92	92	92	92	92	76	92	88	63	92	74	54	92	63	46	92	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	69	92	68	53	92	54	42	82	45	34	69	37	29
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	85	68	92	73	57	92	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	66	92	76	53	84	62	44	67	52	37			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	92	70	92	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	92	78	92	92	68	92	83	53	92	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	92	92	89	92	92	75	92	92	64	92	86	55	92	75	47	92	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	70	92	83	60	92	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	92	92	82	92	92	67	92	77	56	92	64	47	92	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	66	92	64	50	92	51	39	76	41	32	64	34	27	56	31	23
			Exposed	92	92	92	92	92	92	92	92	85	92	87	69	92	73	58	92	63	49	92	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	92	92	92	92	92	92	92	92	92	92	92	83	92	92	71	92	87	61	92	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
20	B	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	75	92	92	61	92	80	50	92	67	42
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	92	62	92	78	49	92	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	92	67	92	73	53	92	59	43	78	48	36			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	85	92	92	72	92	74	54	92	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	79	63	92	65	51			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	77	61	92	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	76	92	90	63
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	84	59	92	68	48	73	56	40	59	47	34
	C	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	89	92	92	69	92	86	55	92	70	44	91	58	36	76	49	32	64	42	28
			Exposed	92	92	92	92	92	92	92	92	83	92	92	71	92	92	61	92	84	54	92	74	47	92	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	82	92	84	61	92	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	92	92	92	92	92	92	92	92	76	92	88	63	92	74	54	92	63	46	92	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	69	92	68	53	92	54	42	82	45	34	69	37	29
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	85	68	92	73	57	92	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	66	92	76	53	84	62	44	67	52	37			
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	92	70	92	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	92	78	92	92	68	92	83	53	92	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	92	92	89	92	92	75	92	92	64	92	86	55	92	75	47	92	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	70	92	83	60	92	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	92	92	82	92	92	67	92	77	56	92	64	47	92	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	66	92	64	50	92	51	39	76	41	32	64	34	27	56	31	23
			Exposed	92	92	92	92	92	92	92	92	85	92	87	69	92	73	58	92	63	49	92	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	92	92	92	92	92	92	92	92	92	92	92	83	92	92	71	92	87	61	92	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	75	92	92	61	92	80	50	92	67	42
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	92	62	92	78	49	92	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	92	67	92	73	53	92	59	43	78	48	36
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	85	92	92	72	92	74	54	92	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	79	63	92	65	51
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	77	61	92	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	76	92	90	63
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	74	92	84	59	92	68	48	73	56	40	59	47	34			
	C	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	89	92	92	69	92	86	55	92	70	44	91	58	36	76	49	32	64	42	28
			Exposed	92	92	92	92	92	92	92	92	83	92	92	71	92	92	61	92	84	54	92	74	47	92	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	82	92	84	61	92	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	92	92	92	92	92	92	92	92	76	92	88	63	92	74	54	92	63	46	92	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	68	53	92	54	42	82	45	34	69	37	29
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	85	68	92	73	57	92	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	66	92	76	53	84	62	44	67	52	37
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	92	70	92	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	90	92	92	78	92	92	68	92	83	53	92	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	92	92	89	92	92	75	92	92	64	92	86	55	92	75	47	92	66	41	92	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	70	92	83	60	92	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	92	92	82	92	92	67	92	77	56	92	64	47	92	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	66	92	64	50	92	51	39	76	41	32	64	34	27	56	31	23
			Exposed	92	92	92	92	92	92	92	92	85	92	87	69	92	73	58	92	63	49	92	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	92	92	92	92	92	92	92	92	92	92	92	83	92	92	71	92	87	61	92	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
40	B	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	75	86	86	61	86	80	50	86	67	42						
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	86	62	86	78	49	86	63	40	82	53	34	69	44	30	58	38	26
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	87	89	89	67	89	73	53	89	59	43	78	48	36			
			Exposed	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	85	89	89	72	89	74	54	89	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	79	63	92	65	51
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	77	61	92	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	76	92	90	63
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	74	92	84	59	92	68	48	73	56	40	59	47	34			
	C	0-7	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	69	86	86	55	86	70	44	86	58	36	76	49	32	64	42	28
			Exposed	86	86	86	86	86	86	86	86	83	86	86	71	86	86	61	86	84	54	86	74	47	86	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	82	89	84	61	89	64	47	85	50	37	65	41	32	56	34	28	48	30	25
			Exposed	89	89	89	89	89	89	89	89	76	89	88	63	89	74	54	89	63	46	89	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	68	53	92	54	42	82	45	34	69	37	29
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	85	68	92	73	57	92	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	66	92	76	53	84	62	44	67	52	37
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	92	70	92	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	78	89	89	68	89	83	53	89	67	42	86	55	35	71	46	30	59	39	27	50	33	24
			Exposed	89	89	89	89	89	75	89	89	64	89	86	55	89	75	47	89	66	41	89	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	70	92	83	60	92	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	92	92	82	92	92	67	92	77	56	92	64	47	92	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	66	92	64	50	92	51	39	76	41	32	64	34	27	56	31	23
			Exposed	92	92	92	92	92	92	92	92	85	92	87	69	92	73	58	92	63	49	92	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	92	92	92	92	92	92	92	92	92	92	92	83	92	92	71	92	87	61	92	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
50	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	75	78	78	61	78	78	50	78	67	42						
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	62	78	78	49	78	63	40	78	53	34	69	44	30	58	38	26
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	67	81	81	48	81	73	53	81	59	43	78	48	36			
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	72	81	74	54	81	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	79	63	92	65	51
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	77	61	92	60	47	90	49	37	74	40	31	63	34	27
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	76	92	90	63
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	74	92	84	59	92	68	48	73	56	40	59	47	34			
	C	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	69	78	78	55	78	70	44	78	58	36	76	49	32	64	42	28
			Exposed	78	78	78	78	78	78	78	78	78	78	78	71	78	78	61	78	78	54	78	74	47	78	59	37	74	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	61	81	64	47	81	50	37	65	41	32	56	34	28	48	30	25
			Exposed	81	81	81	81	81	81	81	81	76	81	81	63	81	74	54	81	63	46	81	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	87	92	68	53	92	54	42	82	45	34	69	37	29
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	85	68	92	73	57	92	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	66	92	76	53	84	62	44	67	52	37
			Exposed	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	81	92	92	70	92	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	78	82	82	68	82	82	53	82	67	42	82	55	35	71	46	30	59	39	27	50	33	24
			Exposed	82	82	82	82	82	75	82	82	64	82	82	55	82	75	47	82	66	41	82	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	85	85	70	85	83	60	85	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	85	85	82	85	85	67	85	77	56	85	64	47	85	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	66	92	64	50	92	51	39	76	41	32	64	34	27	56	31	23
			Exposed	92	92	92	92	92	92	92	92	85	92	87	69	92	73	58	92	63	49	92	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	92	92	92	92	92	92	92	92	92	92	92	83	92	92	71	92	87	61	92	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	61	72	72	50	72	67	42
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	62	72	72	49	72	63	40	72	53	34	69	44	30	58	38	26
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	67	75	73	53	75	59	43	75	48	36
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72	75	74	54	75	57	42	70	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	80	86	79	63	86	65	51
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	81	86	77	61	86	60	47	86	49	37	74	40	31	63	34	27
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	76	84	84	63
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	74	84	84	74	84	84	59	84	68	48	73	56	40	59	47	34
	C	0-7	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	55	72	70	44	72	58	36	72	49	32	64	42	28
			Exposed	72	72	72	72	72	72	72	72	72	72	72	71	72	72	61	72	72	54	72	72	47	72	59	37	72	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	61	75	64	47	75	50	37	65	41	32	56	34	28	48	30	25
			Exposed	75	75	75	75	75	75	75	75	75	75	75	63	75	74	54	75	63	46	75	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	69	86	68	53	86	54	42	82	45	34	69	37	29			
			Exposed	86	86	86	86	86	86	86	86	86	86	86	86	86	86	81	86	85	68	86	73	57	86	55	43	80	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	84	84	66	84	76	53	84	62	44	67	52	37			
			Exposed	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	70	84	77	54	81	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	75	53	75	67	42	75	55	35	71	46	30	59	39	27	50	33	24
			Exposed	75	75	75	75	75	75	75	75	64	75	75	55	75	75	47	75	66	41	75	58	37	72	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	70	78	78	60	78	62	45	77	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	78	78	78	78	78	67	78	77	56	78	64	47	78	55	40	74	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	83	66	90	64	50	90	51	39	76	41	32	64	34	27	56	31	23
			Exposed	90	90	90	90	90	90	90	90	85	90	87	69	90	73	58	90	63	49	90	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	80	92	89	63	92	71	50	76	58	41	60	48	34	49	40	30
			Exposed	92	92	92	92	92	92	92	92	92	92	92	83	92	92	71	92	87	61	92	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
70	B	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	42
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	62	67	67	49	67	63	40	67	53	34	67	44	30	58	38	26
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	53	69	59	43	69	48	36
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	54	69	57	42	69	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	65	51
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	61	77	60	47	77	49	37	74	40	31	63	34	27			
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	63
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	59	73	68	48	73	56	40	59	47	34
	C	0-7	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	55	67	67	44	67	58	36	67	49	32	64	42	28
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	54	67	67	47	67	59	37	67	48	31	60	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	61	69	64	47	69	50	37	65	41	32	56	34	28	48	30	25
			Exposed	69	69	69	69	69	69	69	69	69	69	69	63	69	69	54	69	63	46	69	54	40	66	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	69	77	68	53	77	54	42	77	45	34	69	37	29			
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	68	77	73	57	77	55	43	77	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	66	73	73	53	73	62	44	67	52	37
			Exposed	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	73	54	73	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	68	70	70	53	70	67	42	70	55	35	70	46	30	59	39	27	50	33	24
			Exposed	70	70	70	70	70	70	70	70	64	70	70	55	70	70	47	70	66	41	70	58	37	70	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	70	73	73	60	73	62	45	73	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	73	73	73	73	73	67	73	73	56	73	64	47	73	55	40	73	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	83	66	85	64	50	85	51	39	76	41	32	64	34	27	56	31	23
			Exposed	85	85	85	85	85	85	85	85	85	85	85	69	85	73	58	85	63	49	85	55	42	77	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	80	81	81	63	81	71	50	76	58	41	60	48	34	49	40	30
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	71	81	81	61	81	76	54	78	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	50	62	62	42
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	62	40	62	53	34	62	44	30	58	38	26
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	53	65	59	43	65	48	36
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	54	65	57	42	65	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	63	68	65	51
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	61	68	60	47	68	49	37	68	40	31	63	34	27			
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	48	65	56	40	59	47	34
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	62	42
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	62	40	62	53	34	62	44	30	58	38	26
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	64	47	65	50	37	65	41	32	56	34	28	48	30	25
			Exposed	65	65	65	65	65	65	65	65	65	65	65	63	65	65	54	65	63	46	65	54	40	65	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	53	68	54	42	68	45	34	68	37	29
			Exposed	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	57	68	55	43	68	43	34	66	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	53	65	62	44	65	52	37
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	54	65	60	43	62	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	42	66	55	35	66	46	30	59	39	27	50	33	24			
			Exposed	66	66	66	66	66	66	66	66	64	66	66	55	66	66	47	66	66	41	66	58	37	66	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	62	45	68	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	68	68	68	68	68	67	68	68	56	68	64	47	68	55	40	68	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	66	75	64	50	75	51	39	75	41	32	64	34	27	56	31	23
			Exposed	75	75	75	75	75	75	75	75	75	75	75	69	75	73	58	75	63	49	75	55	42	75	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	63	71	71	50	71	58	41	60	48	34	49	40	30
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	61	71	71	54	71	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	50	59	59	42		
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	49	59	59	40	59	53	34	59	44	30	58	38	26
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	59	43	61	48	36
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	57	42	61	45	34	60	36	30	51	32	26	44	28	23
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	51
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	47	61	49	37	61	40	31	61	34	27
		27-45	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	47	34
	C	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	55	59	59	44	59	58	36	59	49	32	59	42	28
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	47	59	59	37	59	48	31	59	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	47	61	50	37	61	41	32	56	34	28	48	30	25
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61	61	46	61	54	40	61	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	54	42	61	45	34	61	37	29
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	57	61	55	43	61	43	34	61	35	28	56	31	23	48	27	20	42	24	17
		27-45	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	37
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	43	58	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	42	62	55	35	62	46	30	59	39	27	50	33	24
			Exposed	62	62	62	62	62	62	62	62	62	62	62	55	62	62	47	62	62	41	62	58	37	62	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	62	45	65	48	35	62	38	31	53	32	27	45	29	24	39	25	21
			Exposed	65	65	65	65	65	65	65	65	56	65	64	47	65	55	40	65	47	35	65	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	66	67	64	50	67	51	39	67	41	32	64	34	27	56	31	23
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	58	67	63	49	67	55	42	67	42	33	63	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	50	64	58	41	60	48	34	49	40	30
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	61	64	64	54	64	59	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18
100	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	42
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	49	56	56	40	56	53	34	56	44	30	56	38	26
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	43	58	48	36
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	57	42	58	45	34	58	36	30	51	32	26	44	28	23
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51
			Exposed	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	47	55	49	37	55	40	31	55	34	27
		27-45	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	40	52	47	34
	C	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	44	56	56	36	56	49	32	56	42	28
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	47	56	56	37	56	48	31	56	39	27	50	33	24	42	29	21	36	26	19
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	47	58	50	37	58	41	32	56	34	28	48	30	25
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	46	58	54	40	58	41	32	54	33	28	46	29	24	39	25	21	34	22	19	30	20	16
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	54	42	55	45	34	55	37	29
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	43	55	43	34	55	35	28	55	31	23	48	27	20	42	24	17
		27-45	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	37
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	43	52	49	35	49	40	30	39	34	25	34	30	22
	D	0-7	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	42	59	55	35	59	46	30	59	39	27	50	33	24
			Exposed	59	59	59	59	59	59	59	59	59	59	59	55	59	59	47	59	59	41	59	58	37	59	46	31	58	38	26	47	32	23	40	28	20	34	25	18	30	22	16
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	45	61	48	35	61	38	31	53	32	27	45	29	24	39	25	21
			Exposed	61	61	61	61	61	61	61	61	56	61	61	47	61	55	40	61	47	35	61	41	32	53	33	27	44	28	23	37	24	20	32	21	18	29	19	16	25	17	14
		20-27	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	50	61	51	39	61	41	32	61	34	27	56	31	23
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	58	61	61	49	61	55	42	61	42	33	61	34	27	53	29	22	45	26	19	39	23	16	34	20	14
		27-45	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	50	58	58	41	58	48	34	49	40	30
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	54	58	58	42	58	46	33	45	38	28	36	32	24	32	28	21	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	30	46	40	25	46	34	21
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	39	24	46	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	39	31	46	32	25
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	38	30	46	30	23	45	24	19	37	20	15	32	17	13			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	38	46	45	31			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	42	29	46	34	24	36	28	20	29	23	17			
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	34	46	43	27	46	35	22	46	29	18	38	24	16	32	21	14
			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	12	21	15	10	18	13	9			
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	34	46	46	26	46	27	21	41	22	17	34	18	14			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	40	46	42	34	46	36	29	46	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	41	46	46	46	46	46	46	46	46	46	46	46	41	46	46	33	46	38	27	42	31	22	33	26	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11			
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	41	30	46	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	33	46	32	25	46	25	19	38	20	16	32	17	13	28	15	12
			Exposed	46	46	46	46	46	46	46	46	42	46	43	35	46	37	29	46	31	24	46	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	44	31	46	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
10	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	30	46	40	25	46	34	21
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	39	24	46	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	39	31	46	32	25
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	38	30	46	30	23	45	24	19	37	20	15	32	17	13			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	38	46	45	31			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	42	29	46	34	24	36	28	20	29	23	17			
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	34	46	43	27	46	35	22	46	29	18	38	24	16	32	21	14
			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	12	21	15	10	18	13	9			
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	34	46	46	26	46	27	21	41	22	17	34	18	14			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	40	46	42	34	46	36	29	46	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	41	46	46	46	46	46	46	46	46	46	46	46	41	46	46	33	46	38	27	42	31	22	33	26	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11			
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	41	30	46	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	33	46	32	25	46	25	19	38	20	16	32	17	13	28	15	12
			Exposed	46	46	46	46	46	46	46	46	42	46	43	35	46	37	29	46	31	24	46	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	44	31	46	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
20	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	30	46	40	25	46	34	21
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	39	24	46	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	39	31	46	32	25
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	38	30	46	30	23	45	24	19	37	20	15	32	17	13			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	38	46	45	31			
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			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	12	21	15	10	18	13	9			
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	34	46	46	26	46	27	21	41	22	17	34	18	14			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	40	46	42	34	46	36	29	46	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	41	46	46	46	46	46	46	46	46	46	46	46	41	46	46	33	46	38	27	42	31	22	33	26	18			
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	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	41	30	46	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	33	46	32	25	46	25	19	38	20	16	32	17	13	28	15	12
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		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	44	31	46	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	30	46	40	25	46	34	21
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	39	24	46	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	39	31	46	32	25
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	38	30	46	30	23	45	24	19	37	20	15	32	17	13			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	38	46	45	31			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	42	29	46	34	24	36	28	20	29	23	17			
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	34	46	43	27	46	35	22	46	29	18	38	24	16	32	21	14
			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	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	34	46	34	26	46	27	21	41	22	17	34	18	14
			Exposed	46	46	46	46	46	46	46	46	46	46	46	40	46	42	34	46	36	29	46	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	46	46	46	41	46	46	33	46	38	27	42	31	22	33	26	18
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11			
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
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		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	41	30	46	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	33	46	32	25	46	25	19	38	20	16	32	17	13	28	15	12
			Exposed	46	46	46	46	46	46	46	46	42	46	43	35	46	37	29	46	31	24	46	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
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		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	39	31	46	32	25
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	38	30	46	30	23	45	24	19	37	20	15	32	17	13			
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			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
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			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
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			Exposed	46	46	46	46	46	46	46	46	42	46	43	35	46	37	29	46	31	24	46	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
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			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	39	24	46	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
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		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	39	31	46	32	25
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			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	42	29	46	34	24	36	28	20	29	23	17			
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	34	46	43	27	46	35	22	46	29	18	38	24	16	32	21	14
			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	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	34	46	34	26	46	27	21	41	22	17	34	18	14
			Exposed	46	46	46	46	46	46	46	46	46	46	46	40	46	42	34	46	36	29	46	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8			
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	46	46	46	41	46	46	33	46	38	27	42	31	22	33	26	18
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11			
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	41	30	46	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	33	46	32	25	46	25	19	38	20	16	32	17	13	28	15	12
			Exposed	46	46	46	46	46	46	46	46	42	46	43	35	46	37	29	46	31	24	46	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	44	31	46	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	30	46	40	25	46	34	21
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	39	24	46	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	40	44	39	31	44	32	25
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	38	30	44	30	23	44	24	19	37	20	15	32	17	13
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	31
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	29	42	34	24	36	28	20	29	23	17
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	34	46	43	27	46	35	22	46	29	18	38	24	16	32	21	14
			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	34	44	44	34	44	34	26	44	27	21	41	22	17	34	18	14
			Exposed	44	44	44	44	44	44	44	44	44	44	44	40	44	42	34	44	36	29	44	27	21	40	21	17	33	17	14	28	15	11	24	13	10	21	12	8			
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	33	42	38	27	42	31	22	33	26	18						
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	35	42	38	27	40	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	41	30	46	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	33	46	32	25	46	25	19	38	20	16	32	17	13	28	15	12
			Exposed	46	46	46	46	46	46	46	46	42	46	43	35	46	37	29	46	31	24	46	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	44	31	46	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
70	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	37	46	46	30	46	40	25	46	34	21
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	31	46	39	24	46	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	46	36	26	46	29	21	39	24	18			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	36	46	37	27	46	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	32	38	32	25
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	30	38	30	23	38	24	19	37	20	15	32	17	13
		27-45	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	29	36	34	24	36	28	20	29	23	17
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	34	46	43	27	46	35	22	46	29	18	38	24	16	32	21	14
			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	46	31	46	42	27	46	37	23	46	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	42	30	46	32	23	42	25	18	32	20	16	28	17	14	24	15	12
			Exposed	46	46	46	46	46	46	46	46	38	46	44	32	46	37	27	46	31	23	46	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	34	38	34	26	38	27	21	38	22	17	34	18	14
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	29	38	27	21	38	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	27	36	31	22	33	26	18
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	36	27	36	30	21	31	24	17	24	20	15	19	17	13	17	15	11			
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	41	30	46	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	46	46	41	46	46	33	46	38	28	46	32	23	46	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	33	46	32	25	46	25	19	38	20	16	32	17	13	28	15	12
			Exposed	46	46	46	46	46	46	46	46	42	46	43	35	46	37	29	46	31	24	46	27	21	39	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	44	31	46	35	25	38	29	20	30	24	17	24	20	15
			Exposed	46	46	46	46	46	46	46	46	46	46	46	41	46	46	35	46	44	31	46	38	27	39	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
80	B	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	37	44	44	30	44	40	25	44	34	21
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	31	44	39	24	44	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	33	41	36	26	41	29	21	39	24	18
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	36	41	37	27	41	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	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	34	34	34	34	34	34	32	34	32	25
			Exposed	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	30	34	30	23	34	24	19	34	20	15	32	17	13
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	24	32	28	20	29	23	17
	C	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	34	44	43	27	44	35	22	44	29	18	38	24	16	32	21	14
			Exposed	44	44	44	44	44	44	44	44	41	44	44	35	44	44	31	44	42	27	44	37	23	44	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	30	41	32	23	41	25	18	32	20	16	28	17	14	24	15	12
			Exposed	41	41	41	41	41	41	41	41	38	41	41	32	41	37	27	41	31	23	41	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	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	26	34	27	21	34	22	17	34	18	14
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	29	34	27	21	34	21	17	33	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	26
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	27	32	30	21	31	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	42	26	46	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	46	46	45	46	46	37	46	46	32	46	43	27	46	37	24	46	33	21	46	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	41	45	45	35	45	41	30	45	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	45	45	41	45	45	33	45	38	28	45	32	23	45	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	32	25	37	25	19	37	20	16	32	17	13	28	15	12
			Exposed	37	37	37	37	37	37	37	37	37	37	37	37	37	37	29	37	31	24	37	27	21	37	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	25	35	29	20	30	24	17	24	20	15			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	27	35	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	30	42	40	25	42	34	21
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	31	42	39	24	42	32	20	41	26	17	34	22	15	29	19	13
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	26	36	29	21	36	24	18			
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	27	36	28	21	35	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	25
			Exposed	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	23	30	24	19	30	20	15	30	17	13
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	28	20	29	23	17
	C	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	34	42	42	27	42	35	22	42	29	18	38	24	16	32	21	14
			Exposed	42	42	42	42	42	42	42	42	41	42	42	35	42	42	31	42	42	27	42	37	23	42	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	32	23	36	25	18	32	20	16	28	17	14	24	15	12
			Exposed	36	36	36	36	36	36	36	36	36	36	36	32	36	36	27	36	31	23	36	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	26	30	27	21	30	22	17	30	18	14			
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	27	21	30	21	17	30	17	14	28	15	11	24	13	10	21	12	8
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	29	29	22	29	26	18
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	29	29	21	29	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	39	44	44	34	44	42	26	44	33	21	43	27	17	35	23	15	30	19	13	25	17	12
			Exposed	44	44	44	44	44	37	44	44	32	44	43	27	44	37	24	44	33	21	44	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	31	23	38	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	40	40	40	40	40	33	40	38	28	40	32	23	40	27	20	37	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	25	33	25	19	33	20	16	32	17	13	28	15	12
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	29	33	31	24	33	27	21	33	21	16	31	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	25	32	29	20	30	24	17	24	20	15
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	27	32	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9
100	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	30	39	39	25	39	34	21
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	31	39	39	24	39	32	20	39	26	17	34	22	15	29	19	13
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	26	33	29	21	33	24	18
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	27	33	28	21	33	22	17	30	18	15	25	16	13	22	14	11
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	24	19	27	20	15	27	17	13
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	23	17
	C	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	27	39	35	22	39	29	18	38	24	16	32	21	14
			Exposed	39	39	39	39	39	39	39	39	39	39	39	35	39	39	31	39	39	27	39	37	23	39	29	18	37	24	15	30	19	13	25	17	12	21	15	10	18	13	9
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	32	23	33	25	18	32	20	16	28	17	14	24	15	12
			Exposed	33	33	33	33	33	33	33	33	33	33	33	32	33	33	27	33	31	23	33	27	20	33	20	16	27	17	14	23	14	12	19	12	10	17	11	9	15	10	8
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	27	27	21	27	22	17	27	18	14
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	21	27	21	17	27	17	14	27	15	11	24	13	10	21	12	8
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	22	26	26	18			
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	21	26	24	17	24	20	15	19	17	13	17	15	11
	D	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	34	42	42	26	42	33	21	42	27	17	35	23	15	30	19	13	25	17	12
			Exposed	42	42	42	42	42	37	42	42	32	42	42	27	42	37	24	42	33	21	42	29	18	36	23	15	29	19	13	24	16	11	20	14	10	17	12	9	15	11	8
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	30	36	31	23	36	24	17	31	19	15	26	16	13	22	14	12	19	12	10
			Exposed	36	36	36	36	36	33	36	36	28	36	32	23	36	27	20	36	23	17	32	20	16	26	16	13	22	14	11	18	12	10	16	10	9	14	9	8	12	8	7
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	25	30	25	19	30	20	16	30	17	13	28	15	12
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	24	30	27	21	30	21	16	30	17	13	26	14	11	22	13	9	19	11	8	17	10	7
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	25	29	29	20	29	24	17	24	20	15
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	29	29	21	29	23	17	23	19	14	18	16	12	16	14	10	14	12	9

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	73	90	90	60	90	78	49	90	66	42
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	90	60	90	76	48	90	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	85	90	90	66	90	71	52	90	57	42	76	47	35
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	83	90	90	71	90	73	53	90	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	77	61	90	63	50
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	75	59	90	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	74	90	88	62
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
	C	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	90	67	90	84	53	90	68	43	89	57	36	74	48	31	63	41	28
			Exposed	90	90	90	90	90	90	90	90	81	90	90	70	90	90	60	90	83	52	90	73	46	90	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	82	60	90	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	90	90	90	90	90	90	90	90	74	90	86	62	90	72	53	90	61	45	90	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	68	90	66	52	90	53	41	81	44	34	67	36	29	90	90	90
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	83	66	90	71	56	90	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	64	90	74	52	82	61	43	65	51	36	90	90	90
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	90	69	90	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	88	90	90	76	90	90	66	90	82	52	90	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	90	90	87	90	90	73	90	90	62	90	84	53	90	73	46	90	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	69	90	81	59	90	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	90	90	81	90	90	66	90	75	55	90	63	46	90	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	82	65	90	63	49	90	50	38	75	40	32	63	34	27	55	30	23
			Exposed	90	90	90	90	90	90	90	90	83	90	85	68	90	72	57	90	62	48	90	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	87	61	90	69	49	74	56	40	59	47	33	48	39	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	81	90	90	70	90	85	60	90	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
10	B	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	73	90	90	60	90	78	49	90	66	42
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	90	60	90	76	48	90	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	85	90	90	66	90	71	52	90	57	42	76	47	35
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	83	90	90	71	90	73	53	90	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	77	61	90	63	50
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	75	59	90	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	74	90	88	62
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
	C	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	90	67	90	84	53	90	68	43	89	57	36	74	48	31	63	41	28
			Exposed	90	90	90	90	90	90	90	90	81	90	90	70	90	90	60	90	83	52	90	73	46	90	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	82	60	90	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	90	90	90	90	90	90	90	90	74	90	86	62	90	72	53	90	61	45	90	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	68	90	66	52	90	53	41	81	44	34	67	36	29	90	90	90
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	83	66	90	71	56	90	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	64	90	74	52	82	61	43	65	51	36	90	90	90
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	90	69	90	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	88	90	90	76	90	90	66	90	82	52	90	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	90	90	87	90	90	73	90	90	62	90	84	53	90	73	46	90	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	69	90	81	59	90	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	90	90	81	90	90	66	90	75	55	90	63	46	90	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	82	65	90	63	49	90	50	38	75	40	32	63	34	27	55	30	23
			Exposed	90	90	90	90	90	90	90	90	83	90	85	68	90	72	57	90	62	48	90	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	87	61	90	69	49	74	56	40	59	47	33	48	39	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	81	90	90	70	90	85	60	90	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
20	B	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	73	90	90	60	90	78	49	90	66	42
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	90	60	90	76	48	90	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	85	90	90	66	90	71	52	90	57	42	76	47	35
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	83	90	90	71	90	73	53	90	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	77	61	90	63	50
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	75	59	90	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	74	90	88	62
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
	C	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	90	67	90	84	53	90	68	43	89	57	36	74	48	31	63	41	28
			Exposed	90	90	90	90	90	90	90	90	81	90	90	70	90	90	60	90	83	52	90	73	46	90	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	82	60	90	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	90	90	90	90	90	90	90	90	74	90	86	62	90	72	53	90	61	45	90	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	68	90	66	52	90	53	41	81	44	34	67	36	29	90	90	90
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	83	66	90	71	56	90	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	64	90	74	52	82	61	43	65	51	36	90	90	90
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	90	69	90	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	88	90	90	76	90	90	66	90	82	52	90	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	90	90	87	90	90	73	90	90	62	90	84	53	90	73	46	90	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	69	90	81	59	90	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	90	90	81	90	90	66	90	75	55	90	63	46	90	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	82	65	90	63	49	90	50	38	75	40	32	63	34	27	55	30	23
			Exposed	90	90	90	90	90	90	90	90	83	90	85	68	90	72	57	90	62	48	90	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	87	61	90	69	49	74	56	40	59	47	33	48	39	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	81	90	90	70	90	85	60	90	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	73	90	90	60	90	78	49	90	66	42
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	90	60	90	76	48	90	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	85	90	90	66	90	71	52	90	57	42	76	47	35
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	83	90	90	71	90	73	53	90	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	77	61	90	63	50
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	75	59	90	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	74	90	88	62
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	72	90	82	58	90	66	47	71	55	39	57	46	33			
	C	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	87	90	90	67	90	84	53	90	68	43	89	57	36	74	48	31	63	41	28
			Exposed	90	90	90	90	90	90	90	90	81	90	90	70	90	90	60	90	83	52	90	73	46	90	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	82	60	90	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	90	90	90	90	90	90	90	90	74	90	86	62	90	72	53	90	61	45	90	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	68	90	66	52	90	53	41	81	44	34	67	36	29			
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	83	66	90	71	56	90	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	64	90	74	52	82	61	43	65	51	36			
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	90	69	90	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	88	90	90	76	90	90	66	90	82	52	90	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	90	90	87	90	90	73	90	90	62	90	84	53	90	73	46	90	64	41	90	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	69	90	81	59	90	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	90	90	81	90	90	66	90	75	55	90	63	46	90	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	82	65	90	63	49	90	50	38	75	40	32	63	34	27	55	30	23
			Exposed	90	90	90	90	90	90	90	90	83	90	85	68	90	72	57	90	62	48	90	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	87	61	90	69	49	74	56	40	59	47	33	48	39	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	81	90	90	70	90	85	60	90	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
40	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	73	85	85	60	85	78	49	85	66	42
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	85	60	85	76	48	85	62	39	81	52	33	67	43	29	57	37	26
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	88	88	88	88	88	66	88	71	52	88	57	42	76	47	35
			Exposed	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	83	88	88	71	88	73	53	88	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	77	61	90	63	50
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	75	59	90	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	74	90	88	62
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	72	90	82	58	90	66	47	71	55	39	57	46	33			
	C	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	67	85	84	53	85	68	43	85	57	36	74	48	31	63	41	28
			Exposed	85	85	85	85	85	85	85	85	81	85	85	70	85	85	60	85	83	52	85	73	46	85	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	80	88	82	60	88	63	46	83	49	36	63	40	31	54	33	28	47	30	24
			Exposed	88	88	88	88	88	88	88	88	74	88	86	62	88	72	53	88	61	45	88	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	68	90	66	52	90	53	41	81	44	34	67	36	29			
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	83	66	90	71	56	90	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	64	90	74	52	82	61	43	65	51	36			
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	90	69	90	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	76	88	88	66	88	82	52	88	66	41	84	54	34	69	45	30	58	38	26	49	33	23
			Exposed	88	88	87	88	88	73	88	88	62	88	84	53	88	73	46	88	64	41	88	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	69	90	81	59	90	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	90	90	81	90	90	66	90	75	55	90	63	46	90	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	82	65	90	63	49	90	50	38	75	40	32	63	34	27	55	30	23
			Exposed	90	90	90	90	90	90	90	90	83	90	85	68	90	72	57	90	62	48	90	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	87	61	90	69	49	74	56	40	59	47	33	48	39	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	81	90	90	70	90	85	60	90	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
50	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	73	77	77	60	77	77	49	77	66	42
			Exposed	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	60	77	76	48	77	62	39	77	52	33	67	43	29	57	37	26
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	66	80	71	52	80	57	42	76	47	35
			Exposed	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	71	80	73	53	80	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	77	61	90	63	50
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	80	90	75	59	90	59	46	88	48	37	72	39	31	62	33	26
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	74	90	88	62
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	72	90	82	58	90	66	47	71	55	39	57	46	33			
	C	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	67	77	77	53	77	68	43	77	57	36	74	48	31	63	41	28
			Exposed	77	77	77	77	77	77	77	77	77	77	77	70	77	77	60	77	77	52	77	73	46	77	58	36	73	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	60	80	63	46	80	49	36	63	40	31	54	33	28	47	30	24
			Exposed	80	80	80	80	80	80	80	80	74	80	80	62	80	72	53	80	61	45	80	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	68	90	66	52	90	53	41	81	44	34	67	36	29			
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	83	66	90	71	56	90	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	81	90	90	64	90	74	52	82	61	43	65	51	36			
			Exposed	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	79	90	90	69	90	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76	81	81	66	81	81	52	81	66	41	81	54	34	69	45	30	58	38	26	49	33	23
			Exposed	81	81	81	81	81	73	81	81	62	81	81	53	81	73	46	81	64	41	81	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	84	84	69	84	81	59	84	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	84	84	81	84	84	66	84	75	55	84	63	46	84	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	82	65	90	63	49	90	50	38	75	40	32	63	34	27	55	30	23
			Exposed	90	90	90	90	90	90	90	90	83	90	85	68	90	72	57	90	62	48	90	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	87	61	90	69	49	74	56	40	59	47	33	48	39	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	81	90	90	70	90	85	60	90	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	60	71	71	49	71	66	42
			Exposed	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	60	71	71	48	71	62	39	71	52	33	67	43	29	57	37	26
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	66	74	71	52	74	57	42	74	47	35
			Exposed	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	71	74	73	53	74	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	78	85	77	61	85	63	50
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	80	85	75	59	85	59	46	85	48	37	72	39	31	62	33	26
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	74	82	82	62
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	72	82	82	58	82	66	47	71	55	39	57	46	33			
	C	0-7	Interior	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	67	71	71	53	71	68	43	71	57	36	71	48	31	63	41	28
			Exposed	71	71	71	71	71	71	71	71	71	71	71	70	71	71	60	71	71	52	71	71	46	71	58	36	71	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	60	74	63	46	74	49	36	63	40	31	54	33	28	47	30	24
			Exposed	74	74	74	74	74	74	74	74	74	74	74	62	74	72	53	74	61	45	74	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	68	85	66	52	85	53	41	81	44	34	67	36	29			
			Exposed	85	85	85	85	85	85	85	85	85	85	85	85	85	85	79	85	83	66	85	71	56	85	54	42	78	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	81	82	82	64	82	74	52	82	61	43	65	51	36			
			Exposed	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	79	82	82	69	82	75	53	79	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	66	74	74	52	74	66	41	74	54	34	69	45	30	58	38	26	49	33	23
			Exposed	74	74	74	74	74	73	74	74	62	74	74	53	74	73	46	74	64	41	74	57	36	70	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	69	78	78	59	78	60	44	75	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	78	78	78	78	78	66	78	75	55	78	63	46	78	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	82	65	88	63	49	88	50	38	75	40	32	63	34	27	55	30	23
			Exposed	88	88	88	88	88	88	88	88	83	88	85	68	88	72	57	88	62	48	88	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	78	90	87	61	90	69	49	74	56	40	59	47	33	48	39	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	81	90	90	70	90	85	60	90	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
70	B	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	60	66	66	49	66	66	42
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	60	66	66	48	66	62	39	66	52	33	66	43	29	57	37	26
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66	69	69	52	69	57	42	69	47	35
			Exposed	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	53	69	56	41	69	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	61	75	63	50
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	59	75	59	46	75	48	37	72	39	31	62	33	26
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	62
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	58	72	66	47	71	55	39	57	46	33
	C	0-7	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	53	66	66	43	66	57	36	66	48	31	63	41	28
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	60	66	66	52	66	66	46	66	58	36	66	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	60	69	63	46	69	49	36	63	40	31	54	33	28	47	30	24
			Exposed	69	69	69	69	69	69	69	69	69	69	69	62	69	69	53	69	61	45	69	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	68	75	66	52	75	53	41	75	44	34	67	36	29			
			Exposed	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	66	75	71	56	75	54	42	75	42	33	64	34	27	55	30	23	47	26	19	41	23	17
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	64	72	72	52	72	61	43	65	51	36
			Exposed	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	53	72	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	66	69	69	52	69	66	41	69	54	34	69	45	30	58	38	26	49	33	23
			Exposed	69	69	69	69	69	69	69	69	62	69	69	53	69	69	46	69	64	41	69	57	36	69	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	69	72	72	59	72	60	44	72	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	72	72	72	72	72	66	72	72	55	72	63	46	72	53	39	72	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	65	83	63	49	83	50	38	75	40	32	63	34	27	55	30	23
			Exposed	83	83	83	83	83	83	83	83	83	83	83	68	83	72	57	83	62	48	83	53	41	76	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	79	79	61	79	69	49	74	56	40	59	47	33	48	39	29
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	70	79	79	60	79	74	52	76	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
80	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	49	62	62	42
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	48	62	62	39	62	52	33	62	43	29	57	37	26
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	52	64	57	42	64	47	35
			Exposed	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	53	64	56	41	64	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	63	50
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	59	66	59	46	66	48	37	66	39	31	62	33	26
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	58	63	63	47	63	55	39	57	46	33
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	49	62	62	42
			Exposed	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	52	62	62	46	62	58	36	62	47	31	59	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	60	64	63	46	64	49	36	63	40	31	54	33	28	47	30	24
			Exposed	64	64	64	64	64	64	64	64	64	64	64	62	64	64	53	64	61	45	64	53	39	64	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	63	50
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	56	66	54	42	66	42	33	64	34	27	55	30	23
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	52	63	61	43
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	59	42	60	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	41	65	54	34	65	45	30	58	38	26	49	33	23
			Exposed	65	65	65	65	65	65	65	65	62	65	65	53	65	65	46	65	64	41	65	57	36	65	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	60	44	68	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	68	68	68	68	68	66	68	68	55	68	63	46	68	53	39	68	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	65	73	63	49	73	50	38	73	40	32	63	34	27	55	30	23
			Exposed	73	73	73	73	73	73	73	73	73	73	73	68	73	72	57	73	62	48	73	53	41	73	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	61	70	69	49	70	56	40	59	47	33	48	39	29
			Exposed	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	60	70	70	52	70	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	49	58	58	42
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	48	58	58	39	58	52	33	58	43	29	57	37	26
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	57	42	61	47	35
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	56	41	61	44	33	58	36	29	50	31	26	43	28	23
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	50
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		27-45	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
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	C	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	43	58	57	36	58	48	31	58	41	28
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	46	58	58	36	58	47	31	58	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	46	61	49	36	61	40	31	54	33	28	47	30	24
			Exposed	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	45	61	53	39	61	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	52	59	53	41	59	44	34	59	36	29
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			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	42	57	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	52	61	61	41	61	54	34	61	45	30	58	38	26	49	33	23
			Exposed	61	61	61	61	61	61	61	61	61	61	61	53	61	61	46	61	61	41	61	57	36	61	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	59	64	60	44	64	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	64	64	64	64	64	64	64	64	55	64	63	46	64	53	39	64	46	34	64	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	65	66	63	49	66	50	38	66	40	32	63	34	27	55	30	23
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	57	66	62	48	66	53	41	66	41	32	62	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	61	63	63	49	63	56	40	59	47	33	48	39	29
			Exposed	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	60	63	63	52	63	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18
100	B	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	49	55	55	42
			Exposed	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	48	55	55	39	55	52	33	55	43	29	55	37	26
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	57	42	58	47	35
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		20-27	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	50
			Exposed	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	46	54	48	37	54	39	31	54	33	26
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	39	51	46	33
	C	0-7	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	43	55	55	36	55	48	31	55	41	28
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	46	55	55	36	55	47	31	55	38	27	49	33	23	41	29	20	35	26	18
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	46	58	49	36	58	40	31	54	33	28	47	30	24
			Exposed	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	45	58	53	39	58	40	32	53	33	27	45	28	23	38	25	21	33	22	18	30	19	16
		20-27	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	52	54	53	41	54	44	34	54	36	29
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	42	54	42	33	54	34	27	54	30	23	47	26	19	41	23	17
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	43	51	51	36
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	42	51	48	34	48	39	29	38	33	25	33	29	22
	D	0-7	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	41	58	54	34	58	45	30	58	38	26	49	33	23
			Exposed	58	58	58	58	58	58	58	58	58	58	58	53	58	58	46	58	58	41	58	57	36	58	45	30	57	37	26	46	31	22	39	27	19	33	24	17	29	21	15
		7-20	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	60	44	61	47	35	60	37	30	51	32	26	44	28	23	38	25	21
			Exposed	61	61	61	61	61	61	61	61	55	61	61	46	61	53	39	61	46	34	61	40	31	52	32	27	43	27	23	37	24	20	32	21	17	28	18	15	25	16	13
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	49	59	50	38	59	40	32	59	34	27	55	30	23	47	26	19
			Exposed	59	59	59	59	59	59	59	59	59	59	59	59	59	59	57	59	59	48	59	53	41	59	41	32	59	33	26	52	29	22	44	25	18	38	22	16	33	20	13
		27-45	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	49	57	56	40	57	47	33	48	39	29
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	52	57	57	41	57	45	33	44	37	28	35	32	23	31	28	20	28	25	18

Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

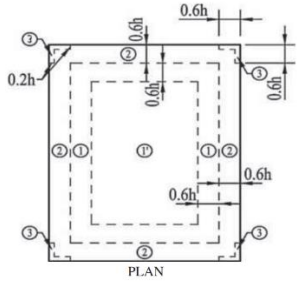
Seismic Design Assumptions

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

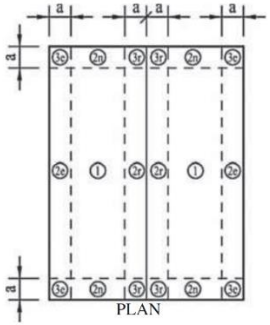
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

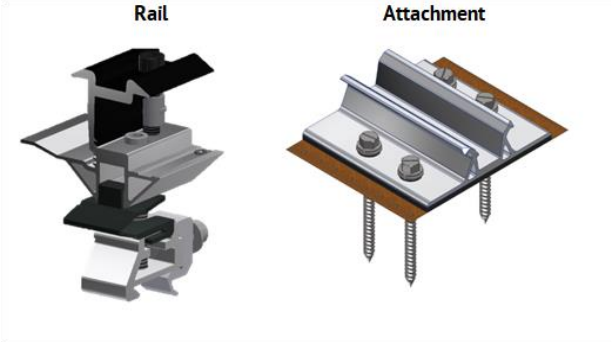
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Micro Rail - DtD OSB

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	8	5	4	8	5	3	7	4	3
			Exposed	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	8	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	4	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	6	4	3	6	3	3	5	3	2	4	3	2	4	2	2
			Exposed	7	7	6	7	6	5	7	6	4	7	5	4	7	4	4	6	4	3	6	4	3	5	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	8	4	3	7	4	2	6	3	2	5	3	2
			Exposed	8	8	6	8	8	5	8	7	4	8	6	4	8	5	4	8	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	8	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	4	2
			Exposed	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	3	2
			Exposed	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	6	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	7	6	5	7	5	4	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	9	9	7	9	9	7	9	9	6	9	8	5	9	7	5	9	6	4	9	6	4	9	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	9	7	5	9	6	4	9	6	4	9	5	3	8	4	3	7	4	3	7	4	2	5	3	2	4	2	1	3	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	10	10	10	10	10	8	10	10	7	10	10	6	10	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	10	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
40	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	5	4	3	5	3	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	4	4	2	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	5	4	3	5	3	3	5	3	2	4	3	2	4	2	2
			Exposed	6	6	6	6	6	5	6	6	4	6	5	4	6	4	4	6	4	3	6	4	3	5	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	7	5	4	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	7	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	4	2
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	3	2	4	3	2
			Exposed	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	3	2	1	3	2	1	2	1	1
		20-27	Interior	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	6	4	6	5	3	5	4	3	5	3	2	4	2	2	4	2	2	3	2	1
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	7	8	8	6	7	7	6	7	7	5	7	7	4	6	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
50	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	4	3	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	4	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4	6	5	3	5	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	5	5	3	5	4	2	4	4	2
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	4	3	3	4	3	2	4	3	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	4	3	5	3	2	4	2	2	3	2	1	3	2	1	2	1	1			
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	6	4	6	5	3	6	4	3	6	4	3	5	4	2	5	3	2	5	3	2	
			Exposed	6	6	5	6	6	5	6	6	4	6	6	4	6	5	4	6	5	3	6	4	3	6	4	2	6	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	6	6	4	6	5	3	5	5	3	5	4	2	4	4	2		
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	3	2			
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	3	2	3	2	1	3	2	1	2	1	1			
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2			
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1	2	1	1			
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	3	2	5	3	2	5	3	2			
			Exposed	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1			
		27-45	Interior	8	8	8	8	8	8	8	8	7	8	8	6	7	7	6	7	7	5	7	7	4	6	6	4	6	5	3	5	4	3	4	4	2	4	3	2			
			Exposed	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1			

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	5	3	2	5	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	4	5	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	6	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2	3	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	4	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	5	4	3	5	3	2	5	3	2	5	3	2	4	2	1
			Exposed	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	3	6	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5	6	6	4	6	6	4	5	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
70	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	5	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	4	5	5	4	5	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	5	5	3	5	4	3	4	4	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	3	5	4	2	4	3	2	4	3	2	3	3	2	3	3	2
80	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	5	4	3	4	4	2	4	4	2	4	3	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	2	4	3	2	4	3	2	4	4	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2	3	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3	4	4	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	3	3	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3	4	4	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	11	11	8	11	10	7	11	9	6	11	8	6
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	9	11	10	7	11	9	6	11	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	9	7	11	8	6	10	7	5	9	6	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	8	11	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	13	8	14	11	7	14	9	6	14	8	5	13	7	5
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	14	12	8	14	11	8	14	9	6	14	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	12	16	16	10	15	14	8	13	12	7	12	10	6	10	9	5
			Exposed	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	16	10	16	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	7	11	9	6	10	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	8	7	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3
			Exposed	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	14	9	6	14	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	16	16	16	16	16	16	16	16	15	16	16	14	16	16	12	16	16	11	16	15	10	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	16	16	12	16	16	10	16	15	9	15	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	8	11	9	6	11	8	5	9	7	5	8	6	4	7	5	4	6	5	3
			Exposed	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	11	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	15	15	13	15	15	11	15	15	10	15	14	9	15	12	8	15	11	7	15	10	7	15	8	6	13	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	15	12	8	15	11	7	15	10	6	15	9	6	14	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	14	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	17	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
40	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8	6	9	7	5	9	6	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	8	10	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	12	9	6	12	8	5	11	7	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	8	12	9	6	12	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	13	13	8	12	12	7	12	10	6	10	9	5
			Exposed	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	9	10	10	8	10	8	7	9	7	6	9	6	5	8	5	4	7	5	4	6	4	3
			Exposed	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	11	7	5	11	6	4	10	6	4	9	5	3
			Exposed	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	13	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	14	14	12	14	14	10	14	14	9	14	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	6	10	8	5	9	7	5	8	6	4	7	5	4	6	5	3
			Exposed	10	10	9	10	10	8	10	10	7	10	10	7	10	9	6	10	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	7	10	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	13	13	13	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	10	7	13	8	6	12	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	13	12	8	13	11	7	13	10	6	13	9	6	13	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	15	15	15	15	15	14	15	15	12	15	15	11	14	14	10	14	14	9	13	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	15	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
50	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	8	10	10	7	10	9	6	10	8	5	10	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	6	10	8	5	10	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	12	12	8	11	11	7	10	10	6	10	9	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	5	4	6	4	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	9	6	4	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	9	6	10	8	5	10	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	11	11	7	10	9	6	9	8	5	8	7	4	7	6	4	7	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	7	5	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	8	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	2
		20-27	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	8	6	10	7	5	10	6	4	9	5	4	8	5	3	7	4	3
			Exposed	11	11	8	11	11	7	11	10	6	11	9	6	11	8	5	11	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	12	12	9	12	12	8	11	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	13	13	10	13	13	8	13	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	7	5	4	7	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	8	5	8	5	3
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	6	9	8	5	9	7	5	9	6	4	9	5	3
		27-45	Interior	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	10	10	10	8	10	10	7	9	9	6
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	7	11	10	6	10	9	5	9	8	5	7	7	4
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	6	5	4	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	8	6	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	4	6	4	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	8	6	9	7	5	9	6	4	8	5	4	8	5	3
			Exposed	10	10	8	10	10	7	10	10	6	10	9	6	10	8	5	10	7	5	10	6	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	11	11	9	11	11	8	10	10	6	10	9	5	9	8	5	8	7	4	7	6	4
			Exposed	12	12	10	12	12	8	12	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	9	7	9	9	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	9	9	5	9	8	5	7	7	4
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	5	4	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	5	8	6	4	7	6	4	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	7	8	8	6	8	8	5	7	7	4	7	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	7	6	4	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	9	7	9	9	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	9	9	5	9	8	5	7	7	4
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	8	8	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	5	8	8	5	7	7	4
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	6	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	4	5	4	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	4	3	5	4	3	5	3	2	4	3	2	4	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	6	4	2	5	3	2	5	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	6	8	8	5	8	8	5	7	7	4	7	6	4
			Exposed	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	5	7	7	4
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	6	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	5	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	6	7	7	5	7	7	5	7	7	4	6	6	4
			Exposed	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	8	8	5	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	6	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	6	7	7	5	7	7	5	6	6	4	6	6	4
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	8	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	11	8	5	9	7	5	8	6	4	7	5	3	6	4	3	5	4	3
			Exposed	12	12	8	12	10	7	12	9	6	12	8	6	10	7	5	9	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	12	12	11	12	12	10	12	11	9	12	9	8	12	9	7	12	8	6	11	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2
			Exposed	12	8	7	12	8	6	11	7	5	9	6	5	9	5	4	8	5	4	7	4	4	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	12	10	7	12	9	6	12	8	5	12	7	5	12	7	4	11	6	4	10	5	4	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	10	9	6	9	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	12	12	9	12	12	8	12	10	7	10	9	6	9	8	5	9	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	12	12	9	12	11	8	12	10	7	12	9	6	11	8	5	10	7	5	9	6	4	8	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	11	8	5	10	7	5	9	6	4	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	12	9	7	12	8	7	11	7	6	10	6	5	9	6	5	8	5	4	8	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	9	6	5	8	5	4	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	12	11	8	12	10	7	12	9	6	12	8	5	12	7	5	12	6	4	10	6	4	9	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	12	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	12	12	10	12	12	9	12	11	8	11	10	7	10	9	6	9	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	10	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	12	10	7	12	9	6	11	8	6	10	7	5	9	7	4	8	6	4	8	5	4	6	4	3	5	4	3	5	3	2	4	3	2	3	2	1	3	2	1
			Exposed	9	6	4	8	6	4	7	5	3	6	5	3	6	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	12	8	6	11	7	5	9	6	5	8	5	4	8	5	4	7	4	3	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	8	5	4	7	4	3	6	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	12	9	6	12	8	5	12	7	5	12	7	4	11	6	4	9	5	3	9	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	10	6	4	9	5	3	8	5	3	7	4	3	7	4	2	6	3	2	5	3	2	5	2	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1
		27-45	Interior	12	12	8	12	10	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
10	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	5	8	7	5	8	6	4	7	5	3	6	4	3	5	4	3
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2
			Exposed	8	8	7	8	8	6	8	7	5	8	6	5	8	5	4	8	5	4	7	4	4	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	11	9	6	11	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	11	10	7	11	9	6	11	8	5	11	7	5	11	7	4	11	6	4	10	5	4	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	10	9	6	9	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	12	12	9	12	12	8	12	10	7	10	9	6	9	8	5	9	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	8	8	5	8	7	5	8	6	4	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	8	8	7	8	8	7	8	7	6	8	6	5	8	6	5	8	5	4	8	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	8	6	5	8	5	4	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	11	11	8	11	10	7	11	9	6	11	8	5	11	7	5	11	6	4	10	6	4	9	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	11	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	12	12	10	12	12	9	12	11	8	11	10	7	10	9	6	9	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	10	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	8	8	7	8	8	6	8	8	6	8	7	5	8	7	4	8	6	4	8	5	4	6	4	3	5	4	3	5	3	2	4	3	2	3	2	1	3	2	1
			Exposed	8	6	4	8	6	4	7	5	3	6	5	3	6	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	8	8	6	8	7	5	8	6	5	8	5	4	8	5	4	7	4	3	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	8	5	4	7	4	3	6	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	9	9	6	9	8	5	9	7	5	9	7	4	9	6	4	9	5	3	9	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	9	6	4	9	5	3	8	5	3	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	3	2	1	4	2	1	3	1	1	2	1	1	2	1	1
		27-45	Interior	10	10	8	10	10	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
20	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4	8	5	3	8	4	3	7	4	2	6	3	2
			Exposed	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	8	6	4	8	5	4	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	6	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	8	7	5	8	6	4	8	6	4	8	5	3	8	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	9	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	1	1	1
		20-27	Interior	9	9	6	9	8	5	9	7	5	9	7	4	9	6	4	9	5	3	9	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	9	6	4	9	5	3	8	5	3	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	3	2	1	4	2	1	3	1	1	2	1	1	2	1	1
		27-45	Interior	10	10	8	10	10	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	3	5	4	3	5	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	3	7	4	3	7	4	2	6	3	2	
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	7	5	4	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	7	5	3	7	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	7	6	4	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	5	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1	2	1	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
40	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	4	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	6	4	2	5	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	4	6	4	3	6	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	3	6	5	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	4	6	4	3	5	3	2	5	3	2	4	2	1	4	2	1
			Exposed	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	3	6	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	6	6	4	6	5	3	5	4	3	4	4	2	4	4	2	3	3	2	3	3	1
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	7	5	3	7	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	7	6	4	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	5	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	7	6	4	6	5	3	5	4	2	4	4	2	3	3	2	3	2	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
50	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	3	5	5	3	5	4	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	3	2	2	3	2	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	3	2	4	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5	5	3	5	4	3	4	4	2	4	4	2	3	3	2	3	2	1
			Exposed	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4	6	6	4	6	6	4	5	5	3	5	4	2	4	3	2	3	3	2	3	3	2	3	2	1
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2	4	3	2	3	2	2	3	2	1	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1	2	1	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	3	2	4	2	2	3	2	1	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	5	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	6	6	5	6	6	4	6	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	4	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	3	2	4	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1	2	1	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	4	4	2	4	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	4	3	2	4	3	2	4	2	2	4	2	1	3	2	1
			Exposed	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	6	6	5	6	6	4	6	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
70	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	4	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	4	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	2	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	3	3	2	3	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	2	1	3	2	1	3	2	1	2	1	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	4	4	2	4	4	2	3	3	2	3	3	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1	2	1	1
			Exposed	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	4	2	3	3	2	3	3	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
80	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	2	3	3	2	3	2	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	2	2	1	2	1	1	2	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	3	3	2	3	3	2	3	2	1	2	1	1	2	1	1
			Exposed	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	4	2	3	3	2	3	3	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		27-45	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	3	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1
		27-45	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	2	1	2	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	9	11	11	8	11	10	7	11	9	6	11	8	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	9	7	11	7	6	10	7	5	9	6	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	10	6	5	9	6	4	7	5	4	7	4	3	6	4	3
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	12	8	14	11	7	14	9	6	13	8	5	12	7	5
			Exposed	14	14	14	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	11	7	14	9	6	14	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	12	16	15	10	15	13	8	13	12	7	11	10	6	10	9	5
			Exposed	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	16	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	9	6	11	8	6	10	7	5	8	6	4	7	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	6	11	8	6	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	8	7	11	7	6	9	6	5	8	5	4	7	4	4	6	4	3
			Exposed	11	11	10	11	10	9	11	9	8	11	8	7	11	8	6	11	7	6	10	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	10	7	14	8	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	14	14	10	14	13	9	14	11	8	14	10	7	14	9	6	14	8	6	13	8	5	11	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	16	16	16	16	16	16	16	16	15	16	16	13	16	16	12	16	16	11	15	15	9	14	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4
			Exposed	16	16	12	16	16	10	16	14	9	14	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	8	11	9	6	11	8	5	9	7	5	8	6	4	7	5	3	6	4	3
			Exposed	11	11	9	11	11	8	11	10	7	11	9	6	11	8	6	11	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	11	7	14	10	7	14	8	6	12	7	5	11	6	4	9	5	3	8	5	3	7	4	3
			Exposed	14	12	8	14	11	7	14	9	6	14	8	6	13	8	5	12	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	15	14	9	14	12	8	12	10	6	10	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	16	15	9	15	13	8	13	12	7	12	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
40	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	7	6	9	7	5	9	6	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	6	5	9	6	4	7	5	4	7	4	3	6	4	3
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	12	9	6	11	8	5	11	7	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	9	6	12	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	8	12	12	7	11	10	6	10	9	5
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	8	6	9	7	5	8	6	4	7	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	9	6	9	8	6	9	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	7	6	9	6	5	8	5	4	7	4	4
			Exposed	9	9	9	9	9	9	9	9	8	9	8	7	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	8	6	11	7	5	10	6	4	10	6	4	9	5	3
			Exposed	12	12	10	12	12	9	12	11	8	12	10	7	12	9	6	12	8	6	12	8	5	11	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	12	12	8	12	11	6	10	9	5	8	7	4	7	6	4	6	6	3
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	6	9	8	5	9	7	5	8	6	4	7	5	3	6	4	3
			Exposed	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	5	9	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	7	10	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	8	6	12	7	5	11	6	4	9	5	3	8	5	3	7	4	3
			Exposed	12	12	8	12	11	7	12	9	6	12	8	6	12	8	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2	5	2	2
		27-45	Interior	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	14	9	13	12	8	12	10	6	10	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	14	14	9	14	13	8	13	12	7	12	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
50	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	7	5	7	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	6	5	8	6	4	7	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	9	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	10	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	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	10	11	11	8	11	11	7	10	10	6	10	9	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	4	2
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	4	4	6	4	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	7	5	9	6	4	9	6	4	8	5	3	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	6	10	8	5	10	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	11	11	8	10	10	6	10	9	5	8	7	4	7	6	4	7	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	6	4	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	8	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	8	7	6	8	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	8	6	10	7	5	10	6	4	9	5	3	8	5	3	7	4	3
			Exposed	11	11	8	11	11	7	11	9	6	11	8	6	11	8	5	11	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	13	13	13	13	13	13	13	13	12	13	13	11	12	12	10	12	12	9	12	12	8	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	13	13	9	13	13	8	13	12	7	12	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	6	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	8	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	9	5	3	8	4	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	9	9	6	9	9	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	3	6	4	3	5	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	9	6	8	7	5	8	6	4	8	6	4	7	5	3
			Exposed	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	5	9	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2		
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	6	9	9	5	8	8	5	8	7	4	7	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	10	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2		
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	3	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	7	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	9	8	6	9	7	5	9	6	4	8	5	3	8	5	3	7	4	2	5	3	2
			Exposed	10	10	8	10	10	7	10	9	6	10	8	6	10	8	5	10	7	5	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	10	10	8	10	10	6	9	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	11	11	9	11	11	8	11	11	7	11	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	4	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	6	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	6	4	8	5	4	7	5	3	7	4	3	6	3	2	5	3	2		
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	9	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	6	4	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	7	5	8	6	4	7	5	3	7	4	3	6	3	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
80	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3	6	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2		
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3	6	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2		
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	4	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	6	3	2	5	3	2	4	2	2	3	2	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2		

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	7	7	5	6	6	4	6	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	7	7	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	5	3	6	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	5	7	7	5	7	7	4	6	6	3	6	5	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
100	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	6	3
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	4	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	5	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	5	3	5	4	3	4	4	2
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	5	5	3	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	6	4	2	6	3	2	5	3	2	5	2	2	5	2	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	6	6	4	6	6	3	6	5	3	5	4	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	5	7	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	8	5	4	8	5	3	7	4	3
			Exposed	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	8	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	4	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	6	4	3	6	3	3	5	3	2	4	3	2	4	2	2
			Exposed	7	7	6	7	6	5	7	6	4	7	5	4	7	4	4	6	4	3	6	4	3	5	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	8	4	3	7	4	2	6	3	2	5	3	2
			Exposed	8	8	6	8	8	5	8	7	4	8	6	4	8	5	4	8	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	8	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	4	2
			Exposed	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	3	2
			Exposed	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	6	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	7	6	5	7	5	4	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	9	9	7	9	9	7	9	9	6	9	8	5	9	7	5	9	6	4	9	6	4	9	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	9	7	5	9	6	4	9	6	4	9	5	3	8	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	10	10	10	10	10	8	10	10	7	10	10	6	10	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	10	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
40	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	5	4	3	5	3	3	4	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	4	4	3	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	5	4	3	5	3	3	5	3	2	4	3	2	4	2	2
			Exposed	6	6	6	6	6	5	6	6	4	6	5	4	6	4	4	6	4	3	6	4	3	5	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	7	5	4	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	7	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	4	2
			Exposed	8	8	7	8	8	6	8	8	5	8	8	5	8	7	4	7	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	3	2	4	3	2
			Exposed	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	7	7	7	7	7	7	7	7	6	7	7	5	7	7	6	7	7	5	7	7	5	7	6	4	6	5	3	6	4	3	5	3	2	5	3	2	4	2	1
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	7	5	4	6	4	3	6	4	3	5	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		27-45	Interior	8	8	8	8	8	8	8	8	7	8	8	6	7	7	6	7	7	5	7	7	4	6	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
50	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	4	3	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	4	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4	6	5	3	5	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	2	2	3	2	1	3	2	1	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	4	4	3	4	3	2	4	2	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	4	3	5	3	2	4	2	2	3	2	1	3	2	1	2	1	1	2	1	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	6	4	3	5	4	2	5	3	2	5	3	2	4
			Exposed	6	6	5	6	6	4	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2	6	3	2	5	3	2	4	2	1	4	2	1	4	2	1	3	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	6	6	4	6	5	3	5	4	2	4	4	2	4	4	2	4
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	5	4	3	5	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	8	8	8	8	8	8	8	8	7	8	8	6	7	7	6	7	7	5	7	7	4	6	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	5	3	2	5	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	4	5	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	6	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2	3	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	5	5	3	5	4	3	5	4	2	4	4	2	4	4	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	5	4	3	5	3	2	5	3	2	5	3	2	4	2	1
			Exposed	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	3	6	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5	6	6	4	6	6	4	5	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
70	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	4	5	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	5	5	3	5	4	3	4	4	2	4	3	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	5	5	3	5	4	3	4	4	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	5	5	3	5	4	3	4	4	2	4	3	2
80	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	5	4	3	4	4	2	4	4	2	4	3	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	2	4	4	2	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	5	4	2	4	4	3	4	3	2	4	3	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	2	4	4	2	4	4	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	3	1	3	2	1	3	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3	4	4	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	3	1	3	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	3	3	2	3	2	1	3	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	2	1	3	2	1	3	2	1	3	1	1	3	1	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3	4	4	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	1	1	3	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	11	11	8	11	10	7	11	9	6	11	8	6
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	9	11	10	7	11	9	6	11	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	9	7	11	8	6	10	7	5	9	6	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	8	11	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	13	8	14	11	7	14	9	6	14	8	5	13	7	5
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	14	12	8	14	11	8	14	9	6	14	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	12	16	16	10	15	14	8	13	12	7	12	10	6	10	9	5
			Exposed	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	16	10	16	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	7	11	9	6	10	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	8	7	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3
			Exposed	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	14	9	6	14	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	16	16	16	16	16	16	16	16	15	16	16	14	16	16	12	16	16	11	16	15	10	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	16	16	12	16	16	10	16	15	9	15	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	8	11	9	6	11	8	5	9	7	5	8	6	4	7	5	4	6	5	3
			Exposed	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	11	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	15	15	13	15	15	11	15	15	10	15	14	9	15	12	8	15	11	7	15	10	7	15	8	6	13	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	15	12	8	15	11	7	15	10	6	15	9	6	14	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	14	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	17	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
40	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	6	9	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8	6	9	7	5	9	6	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	8	10	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	12	9	6	12	8	5	11	7	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	8	12	9	6	12	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	13	13	8	12	12	7	12	10	6	10	9	5
			Exposed	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2	
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	9	10	10	8	10	8	7	9	7	6	9	6	5	8	5	4	7	5	4	6	4	3
			Exposed	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	11	7	5	11	6	4	10	6	4	9	5	3
			Exposed	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	13	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	14	14	12	14	14	10	14	14	9	14	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	6	10	8	5	9	7	5	8	6	4	7	5	4	6	5	3
			Exposed	10	10	9	10	10	8	10	10	7	10	10	7	10	9	6	10	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	7	10	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	13	13	13	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	10	7	13	8	6	12	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	13	12	8	13	11	7	13	10	6	13	9	6	13	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	15	15	15	15	15	14	15	15	12	15	15	11	14	14	10	14	14	9	13	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	15	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
50	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	8	10	10	7	10	9	6	10	8	5	10	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	6	10	8	5	10	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	12	12	8	11	11	7	10	10	6	10	9	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3	6	4	2
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	5	4	6	4	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	9	6	4	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	9	6	10	8	5	10	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	11	11	7	10	9	6	10	9	5	8	7	4	7	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	7	5	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2			
		20-27	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	8	6	10	7	5	10	6	4	9	5	4	8	5	3	7	4	3
			Exposed	11	11	8	11	11	7	11	10	6	11	9	6	11	8	5	11	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	12	12	9	12	12	8	11	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	13	13	10	13	13	8	13	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	7	5	4	7	4	3	6	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	8	5	8	5	3	8	5	3
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	6	9	8	5	9	7	5	9	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	10	10	8	10	10	7	9	9	6	9	9	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	6	5	4	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	8	6	4	8	6	4	8	5	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	7	5	7	7	5	7	6	4	7	5	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	8	6	9	7	5	9	6	4	8	5	4	8	5	3	7	4	3
			Exposed	10	10	8	10	10	7	10	10	6	10	9	6	10	8	5	10	7	5	10	6	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2	5	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	11	11	9	11	11	8	10	10	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	12	12	10	12	12	8	12	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	8	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	9	7	9	9	6	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	9	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	5	8	6	4	7	6	4	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	8	8	7	9	9	7	8	8	6	8	8	5	7	7	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	4	6	5	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	7	9	8	6	8	7	5	8	6	4	7	5	4	7	5	3	6	4	3
			Exposed	9	9	8	9	9	7	9	9	7	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	4	7	5	4	6	5	3	6	5	3	5	4	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	6	8	8	5	8	8	5	7	7	4	7	6	4	6	5	3
			Exposed	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	5	8	8	5	7	7	4	7	6	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	6	4	6	5	3	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	4	5	4	3	5	3	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	8	5	8	7	4	7	5	3	7	4	2	5	3	2	5	3	2	5	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	6	8	8	5	8	8	5	7	7	4	7	6	4	6	5	3
			Exposed	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	5	7	7	4
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2	4	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	6	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	5	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	6	7	7	5	7	7	5	7	7	4	6	6	4
			Exposed	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	8	8	5	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	6	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2	4	3	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	6	7	7	5	7	7	5	6	6	4	6	6	4
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	8	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	11	8	5	9	7	5	8	6	4	7	5	3	6	4	3	5	4	3
			Exposed	12	12	8	12	10	7	12	9	6	12	8	6	10	7	5	9	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	12	12	11	12	12	10	12	11	9	12	9	8	12	9	7	12	8	6	11	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2
			Exposed	12	8	7	12	8	6	11	7	5	9	6	5	9	5	4	8	5	4	7	4	4	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	12	10	7	12	9	6	12	8	5	12	7	5	12	7	4	11	6	4	10	5	4	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	10	9	6	9	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	12	12	9	12	12	8	12	10	7	10	9	6	9	8	5	9	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	12	12	9	12	11	8	12	10	7	12	9	6	11	8	5	10	7	5	9	6	4	8	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	11	8	5	10	7	5	9	6	4	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	12	9	7	12	8	7	11	7	6	10	6	5	9	6	5	8	5	4	8	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	9	6	5	8	5	4	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	12	11	8	12	10	7	12	9	6	12	8	5	12	7	5	12	6	4	10	6	4	9	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	12	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	12	12	10	12	12	9	12	11	8	11	10	7	10	9	6	9	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	10	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	12	10	7	12	9	6	11	8	6	10	7	5	9	7	4	8	6	4	8	5	4	6	4	3	5	4	3	5	3	2	4	3	2	3	2	1	3	2	1
			Exposed	9	6	4	8	6	4	7	5	3	6	5	3	6	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	12	8	6	11	7	5	9	6	5	8	5	4	8	5	4	7	4	3	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	8	5	4	7	4	3	6	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	12	9	6	12	8	5	12	7	5	12	7	4	11	6	4	9	5	3	9	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	10	6	4	9	5	3	8	5	3	7	4	3	7	4	2	6	3	2	5	3	2	5	2	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1
		27-45	Interior	12	12	8	12	10	7	10	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1	3	2	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
10	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	5	8	7	5	8	6	4	7	5	3	6	4	3	5	4	3
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2
			Exposed	8	8	7	8	8	6	8	7	5	8	6	5	8	5	4	8	5	4	7	4	4	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	11	9	6	11	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	11	10	7	11	9	6	11	8	5	11	7	5	11	7	4	11	6	4	10	5	4	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	10	9	6	9	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	12	12	9	12	12	8	12	10	7	10	9	6	9	8	5	9	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	5	4	6	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	8	8	5	8	7	5	8	6	4	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	8	8	7	8	8	7	8	7	6	8	6	5	8	6	5	8	5	4	8	5	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	8	6	5	8	5	4	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	11	11	8	11	10	7	11	9	6	11	8	5	11	7	5	11	6	4	10	6	4	9	5	3	7	4	3	6	3	2	5	3	2	4	2	1	3	2	1
			Exposed	11	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	12	12	10	12	12	9	12	11	8	11	10	7	10	9	6	9	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	10	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	8	8	7	8	8	6	8	8	6	8	7	5	8	7	4	8	6	4	8	5	4	6	4	3	5	4	3	5	3	2	4	3	2	3	2	1	3	2	1
			Exposed	8	6	4	8	6	4	7	5	3	6	5	3	6	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	8	8	6	8	7	5	8	6	5	8	5	4	8	5	4	7	4	3	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	8	5	4	7	5	4	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	12	12	9	12	12	8	12	10	7	10	9	6	9	8	5	8	7	4	8	6	4	8	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	3	2
			Exposed	9	7	5	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
		27-45	Interior	10	10	8	10	10	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
20	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	4	3	5	4	3	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	4	3	5	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4	8	5	3	8	4	3	7	4	2	6	3	2
			Exposed	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	8	6	4	8	5	4	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	6	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2	4	2	1
			Exposed	8	7	5	8	6	4	8	6	4	8	5	3	8	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	9	9	6	9	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	9	9	6	9	8	5	9	7	5	9	7	4	9	6	4	9	5	3	9	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	9	6	4	9	5	3	8	5	3	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	3	1	1	2	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	10	10	8	10	10	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	3	5	4	3	5	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	3	7	4	3	7	4	2	6	3	2	4
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	7	5	4	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	6	6	3	6	5	3	5	4	2
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	5	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	6	3	2	5	3	2	4	2	1	4	2	1
			Exposed	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	7	4	3	7	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	7	6	4	6	5	3	5	4	3	4	4	2	4	3	2	3	3	2
			Exposed	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	7	5	3	7	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	7	6	4	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	5	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1	2	1	1
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
40	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	4	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	6	4	2	5	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	4	6	4	3	6	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	3	6	5	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	3	2	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	4	6	4	3	5	3	2	5	3	2	4	2	1	4	2	1
			Exposed	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	3	6	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	6	6	4	6	5	3	5	4	3	4	4	2	4	4	2	3	3	2	3	3	1
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	3	2	2	3	2	1
			Exposed	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	7	7	6	7	7	5	7	7	5	7	7	4	7	6	4	7	5	3	7	5	3	7	4	3	6	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	7	6	4	7	5	3	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	5	2	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	7	6	4	6	5	3	5	4	2	4	4	2	4	3	2	3	3	2
			Exposed	8	7	5	7	7	4	7	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
50	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	4	3	5	4	2	5	3	2	4	2	2	4	3	2	4	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	3	5	5	3	5	4	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	3	2	2	3	2	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	3	5	4	3	5	3	2	4	3	2	4	3	2	4	2	1
			Exposed	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5	5	5	3	5	4	3	4	4	2	4	4	2	4	3	2	3	3	2
			Exposed	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4	6	6	4	5	5	3	5	4	2	4	3	2	3	3	2	3	2	1	3	2	1	2	2	1
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2	4	3	2	3	2	2	3	2	1	2	1	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2	3	2	1	2	1	1
			Exposed	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1	2	1	1	1	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	3	2	5	3	2	4	2	2	4	2	1	3	2	1
			Exposed	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	5	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1
			Exposed	6	6	5	6	6	4	6	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	4	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	2	4	3	2	4	3	2	4	2	1
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	4	3	2	4	3	2	4	2	2	4	2	1	3	2	1
			Exposed	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	5	3	2	5	3	2	4	2	1	3	2	1	3	2	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	4	5	5	3	5	4	2	4	4	2	4	3	2	3	3	2	3	2	1	
			Exposed	6	6	5	6	6	4	6	6	3	6	5	3	5	5	3	5	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
70	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	4	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	3	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	4	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	2	4	3	2	4	3	2	4	2	1
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	4	4	2	4	4	2	3	3	2	3	3	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	1	2	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1	3	2	1
			Exposed	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1	2	2	1	2	2	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	4	2	3	3	2	3	3	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
80	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	3	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	3	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1	2	1	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	2	2	1	2	1	1	2	1	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	3	3	2	3	3	2	3	2	2	3	2	1	2	1	1	2	1	1
			Exposed	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	3	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	4	2	3	3	2	3	3	2	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	3	3	2	3	3	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1	3	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	2	1	2	2	1	2	2	1
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	2	3	1	1	3	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	1	1	2	1	1	2	1	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1
		27-45	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	3	1
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1
		27-45	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	2	2	1	2	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2	1	2	1	1	2	1	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	2	2	1	2	2	1
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	2	1	1	2	1	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	2	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
			Exposed	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	4	2	3	3	2	3	3	1	3	2	1	2	2	1	2	2	1	2	1	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	9	11	11	8	11	10	7	11	9	6	11	8	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	9	7	11	7	6	10	7	5	9	6	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	10	6	5	9	6	4	7	5	4	7	4	3	6	4	3
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	12	8	14	11	7	14	9	6	13	8	5	12	7	5
			Exposed	14	14	14	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	11	7	14	9	6	14	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	12	16	15	10	15	13	8	13	12	7	11	10	6	10	9	5
			Exposed	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	16	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	9	6	11	8	6	10	7	5	8	6	4	7	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	6	11	8	6	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	8	7	11	7	6	9	6	5	8	5	4	7	4	4	6	4	3
			Exposed	11	11	10	11	10	9	11	9	8	11	8	7	11	8	6	11	7	6	10	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	10	7	14	8	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	14	14	10	14	13	9	14	11	8	14	10	7	14	9	6	14	8	6	13	8	5	11	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	16	16	16	16	16	16	16	16	15	16	16	13	16	16	12	16	16	11	15	15	9	14	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4
			Exposed	16	16	12	16	16	10	16	14	9	14	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	8	11	9	6	11	8	5	9	7	5	8	6	4	7	5	3	6	4	3
			Exposed	11	11	9	11	11	8	11	10	7	11	9	6	11	8	6	11	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	11	7	14	10	7	14	8	6	12	7	5	11	6	4	9	5	3	8	5	3	7	4	3
			Exposed	14	12	8	14	11	7	14	9	6	14	8	6	13	8	5	12	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	15	14	9	14	12	8	12	10	6	10	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	16	15	9	15	13	8	13	12	7	12	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
40	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	7	6	9	7	5	9	6	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	6	5	9	6	4	7	5	4	7	4	3	6	4	3
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	12	9	6	11	8	5	11	7	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	9	6	12	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	8	12	12	7	11	10	6	10	9	5
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	8	6	9	7	5	8	6	4	7	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	9	6	9	9	6	9	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	7	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3
			Exposed	9	9	9	9	9	9	9	9	8	9	8	7	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	8	6	11	7	5	10	6	4	10	6	4	9	5	3
			Exposed	12	12	10	12	12	9	12	11	8	12	10	7	12	9	6	12	8	6	12	8	5	11	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	12	12	8	12	11	6	10	9	5	8	7	4	7	6	4	6	6	3
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	6	9	8	5	9	7	5	8	6	4	7	5	3	6	4	3
			Exposed	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	5	9	7	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	7	10	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	8	6	12	7	5	11	6	4	9	5	3	8	5	3	7	4	3
			Exposed	12	12	8	12	11	7	12	9	6	12	8	6	12	8	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2	5	2	2
		27-45	Interior	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	14	9	13	12	8	12	10	6	10	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	14	14	9	14	13	8	13	12	7	12	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
50	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	7	5	7	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	6	5	8	6	4	7	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	9	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	10	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	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	10	11	11	8	11	11	7	10	10	6	10	9	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	4	3	5	4	3	5	3	2	5	3	2
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	4	4	6	4	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	7	5	9	6	4	9	6	4	8	5	3	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	6	10	8	5	10	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	11	11	8	10	10	6	10	9	5	8	7	4	7	7	4	7	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	6	4	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	8	5	8	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	8	7	6	8	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	6	5	8	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	8	6	10	7	5	10	6	4	9	5	3	8	5	3	7	4	3
			Exposed	11	11	8	11	11	7	11	9	6	11	8	6	11	8	5	11	7	5	11	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	13	13	13	13	13	13	13	13	12	13	13	11	12	12	10	12	12	9	12	12	8	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	13	13	9	13	13	8	13	12	7	12	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	6	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	8	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	9	5	3	8	4	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	9	9	6	9	9	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	7	5	8	6	4	8	6	4	7	5	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	5	9	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	6	9	9	5	8	8	5	8	7	4	7	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	10	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	3	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	7	4	7	4	3	6	4	2	4	3	2	4	2	2	3	2	2	3	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	9	8	6	9	7	5	9	6	4	8	5	3	8	5	3	7	4	3	6	3	2
			Exposed	10	10	8	10	10	7	10	9	6	10	8	6	10	8	5	10	7	5	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	10	10	8	10	10	6	9	9	5	9	8	5	7	7	4	7	6	3	6	5	3
			Exposed	11	11	9	11	11	8	11	11	7	11	11	6	11	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	9	5	8	7	4	7	6	4	6	6	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	4	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	5	7	6	4	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	6	4	8	5	4	7	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	6	8	8	5	7	7	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	2	4	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	5	3	3	4	3	2	4	2	2	4	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	7	5	8	6	4	7	6	4	7	5	3	6	4	3
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	8	6	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	5	4	3	5	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	6	9	9	5	8	8	5	7	7	4	7	6	3	6	5	3
			Exposed	10	10	9	10	10	8	10	10	7	10	10	6	10	10	6	10	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
80	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	6	7	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	5	8	7	4	7	6	4
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3	6	3	2	5	3	2
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	6	4	3	4	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	6	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2	4	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	4	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	2	6	3	2	5	3	2	5	2	2	5	2	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	6	8	8	5	7	7	5	7	7	4	7	6	3	6	5	3
			Exposed	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	9	5	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	4	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	7	7	5	6	6	4	6	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	7	7	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	3	5	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	5	3	6	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	5	7	7	5	6	6	3	6	5	3	6	5	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
100	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	4	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	5	3	6	4	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	6	6	3	6	5	3	5	4	2	4	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2	4	2	2	3	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	5	5	3	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2	6	3	2	5	3	2	5	2	2	5	2	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	6	6	5	6	6	4	6	6	3	6	5	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	5	7	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2

Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

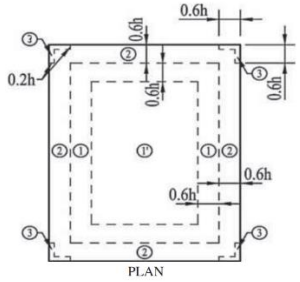
Seismic Design Assumptions

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

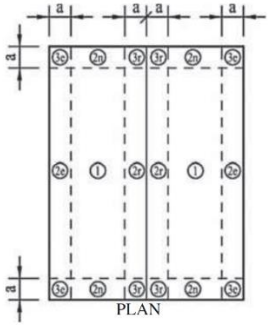
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

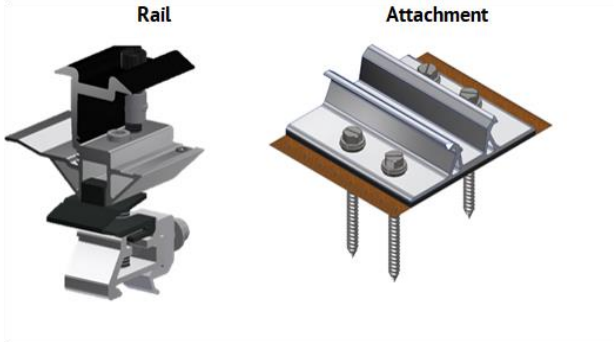
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Micro Rail - DtD Ply

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	13	9	15	11	8	14	10	7	12	8	6	10	7	5	9	7	4
			Exposed	15	15	13	15	15	12	15	15	11	15	14	10	15	12	9	15	11	8	14	10	7	12	9	6	10	7	5	9	6	4	8	5	4	7	5	3	6	4	3
		7-20	Interior	15	15	15	15	15	15	15	15	15	15	15	13	15	14	12	15	13	11	15	12	10	15	10	8	13	8	7	11	7	6	10	6	5	9	5	4	8	5	4
			Exposed	15	14	12	15	13	10	15	11	9	15	10	8	14	9	8	13	8	7	12	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	11	15	15	10	15	12	8	15	10	7	15	9	6	14	8	5	12	7	4	10	6	4
			Exposed	15	15	13	15	15	11	15	14	10	15	12	8	15	11	8	15	10	7	15	9	6	14	8	5	12	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	15	11	15	13	9	13	11	7	11	10	6	10	9	5	8	8	5
			Exposed	16	16	16	16	16	14	16	16	12	16	16	11	16	14	10	14	13	9	13	12	8	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	15	15	15	15	15	13	15	15	11	15	15	10	15	13	9	15	12	8	15	11	8	13	9	6	11	8	5	9	7	5	8	6	4	7	5	3	6	4	3
			Exposed	15	13	9	15	12	8	15	11	7	13	9	7	12	9	6	11	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	15	15	13	15	14	11	15	12	10	15	11	9	15	10	8	14	9	7	13	8	7	11	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	15	10	8	14	9	7	12	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	15	15	14	15	15	12	15	15	11	15	13	9	15	12	8	15	11	7	15	10	7	15	8	6	13	7	5	11	6	4	9	5	3	8	5	3	7	4	3
			Exposed	15	12	8	15	11	7	15	10	6	15	9	6	14	8	5	12	7	5	11	6	4	9	5	4	8	5	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	16	16	16	16	16	16	16	16	14	16	16	12	16	15	11	16	14	9	14	13	8	12	11	7	10	9	6	9	8	5	8	7	4	7	6	3	6	5	3
			Exposed	16	15	11	15	13	9	14	12	8	12	11	7	11	10	6	10	9	6	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	15	15	12	15	15	11	15	14	10	15	12	9	15	11	8	14	10	7	13	9	6	11	8	5	9	6	4	8	6	4	7	5	3	6	4	3	5	4	2
			Exposed	15	11	8	14	10	7	12	9	6	11	8	5	10	7	5	9	6	4	8	6	4	7	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	15	13	11	15	11	9	15	10	8	14	9	7	13	8	7	12	7	6	11	7	6	9	6	5	8	5	4	6	4	3	6	4	3	5	3	2	4	3	2
			Exposed	13	8	7	11	7	6	10	6	5	9	6	5	8	5	4	7	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	15	15	11	15	14	10	15	12	8	15	11	7	15	10	7	15	9	6	15	8	6	12	7	5	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	15	10	7	15	9	6	14	8	5	13	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	16	16	14	16	16	13	16	16	11	16	14	10	14	13	9	13	12	8	12	10	7	10	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	14	13	8	13	11	7	11	10	6	10	9	6	9	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
10	B	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	8	6	10	7	5	9	7	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	8	5	4	7	5	3	6	4	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	8	7	11	7	6	10	6	5	9	5	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	10	8	11	9	8	11	8	7	11	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	11	14	14	10	14	12	8	14	10	7	14	9	6	14	8	5	12	7	4	10	6	4
			Exposed	14	14	13	14	14	11	14	14	10	14	12	8	14	11	8	14	10	7	14	9	6	14	8	5	12	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	11	15	13	9	13	11	7	11	10	6	10	9	5	8	8	5
			Exposed	15	15	15	15	15	14	15	15	12	15	15	11	15	14	10	14	13	9	13	12	8	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	6	10	8	5	9	7	5	8	6	4	7	5	3	6	4	3
			Exposed	10	10	9	10	10	8	10	10	7	10	9	7	10	9	6	10	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	14	14	14	14	14	12	14	14	11	14	12	8	14	12	8	14	11	7	14	10	7	13	8	6	13	7	5	11	6	4	9	5	3	8	5	3	7	4	3
			Exposed	14	12	8	14	11	7	14	10	6	14	9	6	14	8	5	12	7	5	11	6	4	9	5	4	8	5	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	15	15	15	15	15	15	15	15	14	15	15	11	15	14	10	14	13	9	13	12	8	11	10	7	10	9	6	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	15	15	11	15	13	9	14	12	8	12	11	7	11	10	6	10	9	6	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	10	8	10	10	6	10	8	5	9	7	5	8	6	4	7	5	3	6	4	3
			Exposed	10	10	9	10	10	8	10	10	7	10	9	7	10	9	6	10	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	3	6	4	3	5	3	3
			Exposed	11	8	7	11	7	6	10	6	5	9	6	5	8	5	4	7	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	14	14	11	14	14	10	14	12	8	14	11	8	14	11	8	14	10	7	14	9	6	14	8	5	14	8	5	14	8	5	8	5	3	7	4	2	6	3	2
			Exposed	14	14	10	14	14	9	14	12	8	14	11	8	14	10	7	14	9	6	14	8	5	12	7	4	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	11	13	13	10	12	12	9	12	12	8	11	10	7	10	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	13	13	8	13	11	7	11	10	6	10	9	6	9	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
20	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	5	7	5	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	11	10	7	11	9	6	11	8	5	11	7	4	10	6	4
			Exposed	11	11	11	11	11	11	11	11	10	11	11	8	11	11	8	11	10	7	11	9	6	11	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	11	11	7	10	10	6	10	9	5	8	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	3	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	11	7	11	10	7	11	8	6	11	7	5	10	6	4	9	5	3	8	5	3	7	4	3
			Exposed	11	11	8	11	11	7	11	10	6	11	9	6	11	8	5	11	7	5	11	6	4	9	5	4	8	5	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	11	11	7	10	9	6	9	8	5	8	7	4	7	6	3	6	5	3
			Exposed	12	12	11	12	12	9	12	12	8	12	11	7	11	10	6	10	9	6	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	6	4	3	6	4	3	5	3	2	4	3	2
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	5	4	7	5	3	5	3	2	4	3	2	5	3	2	4	2	1	3	2	1	3	2	1
		20-27	Interior	11	11	11	11	11	10	11	11	8	11	11	7	11	10	7	11	9	6	11	8	6	11	7	5	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	11	10	7	11	9	6	11	8	5	11	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	13	13	13	13	13	13	13	13	11	13	13	10	12	12	9	12	12	8	11	10	7	10	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	13	13	8	13	11	7	11	10	6	10	9	6	9	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	8	8	5	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	3	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	8	6	9	7	5	8	6	4	8	5	3	8	5	3	7	4	3
			Exposed	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	5	9	6	4	9	5	4	8	5	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	6	8	8	5	7	7	4	7	6	3	6	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	9	6	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	6	4	3	6	4	3	5	3	2	4	3	2
			Exposed	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	8	6	9	7	5	9	6	4	8	5	3	8	4	3	7	4	2	6	3	2
			Exposed	9	9	7	9	9	6	9	8	5	9	7	5	9	6	4	9	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	1	4	2	1
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	10	10	8	10	10	7	9	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	11	11	8	11	11	7	11	10	6	10	9	6	9	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
40	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	7	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	7	8	8	6	7	7	5	7	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	7	4	7	6	4	6	5	3	5	5	3	5	5	3
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	3	5	4	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	7	5	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	7	7	6	7	7	5	6	6	4	6	5	3	6	4	3
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	5	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	6	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4	7	5	3	7	4	3	6	4	2	6	3	2
			Exposed	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	6	4	8	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
50	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	2	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	6	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	2	5	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	4	4	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	5	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	4	6	5	3	6	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	6	6	5	6	6	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	6	5	6	5	4	4	4	3	4	3	2	4	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	6	5	3	6	4	2	5	3	2	5	3	2
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2	4	2	1	4	2	1	4	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	5	6	6	4	6	6	3	5	5	3	5	4	2
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	4	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4	6	5	3	5	5	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5	5	4	5	5	3	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	4	6	5	3	5	4	2	5	3	2	5	3	2	5	2	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	5	5	5	4	5	5	3	5	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	6	6	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	4	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	3	5	4	3	5	4	2	5	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	3	2	5	3	2	4	2	1	4	2	1	4	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	5	6	6	4	5	5	3	5	5	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
70	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	5	5	3	5	5	3	5	5	3
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	2	5	3	2	4	3	2	4	3	2	4	2	2	4	2	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5	5	4	5	5	3	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	5	5	3	5	5	3	5	4	3	4	4	2	4	3	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2	4	2	2	4	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	4	4	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	4	3	2	4	3	2	4	2	1	4	2	1	4	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	3	5	5	3	4	4	2	4	4	2
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5	6	6	4	6	6	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
80	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	3	2	4	3	2	4	2	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	2	4	3	2	4	3	2	4	2	1	4	2	1	4	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	5	5	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3	4	4	3
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	2	2	3	2	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	4	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	3	2	4	2	1	4	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	4	4	2	4	4	2	3	3	2	3	3	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	2	3	2	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	3	2
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	3	3	2	3	3	2	3	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	4	4	3	4	4	2	4	4	2	3	3	2	3	3	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	12	12	9	12	11	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	11	7	12	9	7	11	8	6	10	7	5
		7-20	Interior	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	10	12	11	9	12	10	8	12	8	7	12	8	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	11	9	12	9	8	12	8	7	11	7	6	10	6	5	8	5	4
		20-27	Interior	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	10	15	13	9	15	12	8	14	10	7
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	12	15	15	11	15	13	9	15	11	8	15	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	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	15	16	16	13	15	15	11	14	14	9	14	13	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	11	16	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	11	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	10	8	12	9	7	11	8	6	10	7	5	9	6	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	12	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	14	10	15	12	8	14	11	7	14	9	6	13	8	5	12	7	5
			Exposed	15	15	14	15	15	12	15	15	11	15	15	10	15	13	9	15	12	8	15	11	7	15	9	6	14	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	16	16	12	15	15	10	14	13	8	13	12	7	11	10	6	10	9	5
			Exposed	17	17	17	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4
			Exposed	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	10	8	12	8	7	11	7	6	10	6	5	9	5	4	8	5	4
			Exposed	12	12	12	12	12	10	12	11	9	12	10	8	12	9	7	12	8	7	12	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	16	16	16	16	16	16	16	16	14	16	16	13	16	16	12	16	16	10	16	14	10	16	12	8	15	10	7	14	9	6	13	8	5	12	7	4	10	6	4
			Exposed	16	16	12	16	15	10	16	14	9	16	12	8	16	11	7	16	10	7	16	9	6	13	8	5	11	7	4	10	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	18	18	18	18	18	18	18	18	18	18	18	16	18	18	15	17	17	13	17	17	12	15	15	10	14	13	8	12	11	7	11	10	6	9	8	5	8	7	4
			Exposed	18	18	15	18	18	13	18	17	11	17	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
40	B	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	9	7	10	8	6	10	7	5
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	10	6	5	8	5	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	13	12	8	12	10	7	12	8	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	11	8	13	10	7	13	8	6	13	7	5	11	7	4
		27-45	Interior	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	14	13	13	13	11	13	13	9	12	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	11	15	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	9	8	6	9	7	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	10	13	12	8	12	11	7	12	9	6	11	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	13	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	12	13	13	10	12	12	8	11	11	7	11	10	6	10	9	5
			Exposed	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4
			Exposed	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	8	11	11	7	11	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	8	7	10	7	6	10	6	5	9	5	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	14	10	14	12	8	13	10	7	12	9	6	11	8	5	11	7	4	10	6	4
			Exposed	14	14	12	14	14	10	14	14	9	14	12	8	14	11	7	14	10	7	14	9	6	13	8	5	11	7	4	10	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	13	15	15	12	13	13	10	13	13	8	12	11	7	11	10	6	9	8	5	8	7	4
			Exposed	16	16	15	16	16	13	16	16	11	16	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
50	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	7	5
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	10	10	7	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	11	7	5	10	7	4
		27-45	Interior	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	12	12	12	12	11	11	11	9	11	11	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	9	12	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	5	8	6	4	8	6	4	7	5	3
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	8	8	6	8	7	5	7	6	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	6	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	11	11	7	10	9	6	10	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	9	6	11	8	5	11	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	10	11	11	8	10	10	7	10	10	6	9	9	5	8	7	4
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	12	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	8	7	9	7	6	8	6	5	8	5	4	8	5	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	8	7	10	8	6	9	6	5	8	6	5	8	5	4	7	5	3	6	4	3	6	4	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	10	12	12	8	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	9	6	12	8	5	11	7	4	10	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	12	12	12	10	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	13	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	7	4	7	5	4
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	8	6	10	7	5	9	7	4
		27-45	Interior	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	11	11	11	11	11	11	10	10	9	10	10	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	11	11	8	11	11	6	10	9	6	9	8	5
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	9	6	9	8	5	9	8	5	8	5	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	9	6	4	9	5	3	8	5	3
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	10	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	11	11	7	10	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	7	6	5	7	5	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	9	7	4	8	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
70	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	7	4	8	7	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	9	9	6	9	9	6	9	8	5
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	7	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	6	5	7	5	4	7	5	3	6	4	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	7	4	2	6	4	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	9	9	8	9	9	7	8	8	6	8	8	5	7	7	4
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	3	7	5	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	5
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5	7	7	5	7	6	4	7	5	3	7	5	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	6	7	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	3	5	3	3	5	3	2	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	7	5	3	7	4	3	7	4	2	6	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	7	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	7	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	6	8	8	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	5	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	6	5	3	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	6	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	7	7	6	7	7	5	7	7	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	6	7	7	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	5	3	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	6	4	3	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	5	6	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	5	3	2	4	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	5	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	6	4	3	6	4	2	4	3	2	
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	5	3	3	5	3	2	4	2	2	4	2	2
			Exposed	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	6	4	3	5	3	2	4	2	2	3	2	1	3	2	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2
			Exposed	8	8	6	8	7	5	8	7	4	8	6	4	8	5	3	8	5	3	8	4	3	6	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	6	7	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	3	2
			Exposed	9	9	7	9	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
40	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2			
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	4	3			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	5	3	2	4	2	2			
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	4	4	3	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2	4	2	2	3	2	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	5	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	4	3	4	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	2	2	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	6	5	3	6	4	3	5	4	2	4	3	2	4	3	2
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	5	3	7	4	3	6	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	6	7	7	5	6	6	4	6	5	3	5	5	3	5	4	2	4	3	2
			Exposed	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	7	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
50	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2			
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	4	3			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	5	3	2			
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	5	5	3	5	4	3	5	4	3	4	4	2
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2			
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	4	5	5	3	5	5	3	4	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	3	2	3	3	1
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	5	4	3	4	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	5	5	3	5	4	2	4	3	2	4	3	2	4	3	2
			Exposed	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	3	2	3	3	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	5	5	5	4	5	5	3	4	4	2	4	3	2	4	3	2
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	4	5	5	3	5	4	3	4	4	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2	4	2	1	4	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5	5	4	5	5	4	4	4	3	4	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	5	5	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	3	3	2	3	2	2	3	2	2	3	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	4	3	2	4	2	1	4	2	1	3	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
70	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	4	4	3	4	4	2	4	4	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3	4	4	2	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	3	2	3	3	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	4	4	3	4	4	2	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	3	2	3	3	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	4	4	3	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
80	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	4	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2	3	2	1	3	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	3	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	2	3	3	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	11	12	12	10	12	12	9	12	11	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	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	10	12	11	9	12	9	8	11	8	7	11	8	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	9	7	12	8	6	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	15	13	9	15	11	8	14	10	7	13	9	6
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	15	10	15	13	9	15	11	7	15	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	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	15	16	16	12	15	15	10	14	14	9	13	13	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	17	17	13	17	16	11	16	14	9	14	12	7	12	10	6	10	9	6	9	8	5
	C	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	9	6	11	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	8	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	10	8	12	8	7	11	7	6	10	6	5	9	6	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	12	7	6	10	6	5	8	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	14	9	15	12	8	14	10	7	13	9	6	13	8	5	12	7	5
			Exposed	15	15	13	15	15	12	15	15	11	15	14	10	15	13	9	15	12	8	15	11	7	15	9	6	13	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	15	15	12	14	14	10	13	13	8	12	11	7	11	10	6	10	9	5
			Exposed	17	17	17	17	17	15	17	17	13	17	17	12	17	16	11	17	15	9	15	14	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	9	7	11	8	6	10	7	5	9	6	4
			Exposed	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	8	12	10	7	11	8	6	10	7	5	8	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	11	8	7	11	7	6	10	6	5	8	5	4	7	5	4
			Exposed	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	11	7	6	10	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	16	14	9	16	12	8	15	10	7	14	9	6	13	7	5	11	7	4	10	6	4
			Exposed	16	16	11	16	15	10	16	13	9	16	12	8	16	11	7	16	10	7	16	9	6	13	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	18	18	18	18	18	18	18	18	18	18	18	16	18	18	14	17	17	13	16	16	11	15	15	9	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4
			Exposed	18	18	14	18	18	12	18	17	11	17	15	10	15	14	9	14	12	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
40	B	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	9	6	10	8	6	10	7	5
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	6	10	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	7	10	8	6	10	7	6	9	6	5	8	5	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	12	11	8	12	10	7	11	8	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	10	13	13	9	13	11	7	13	10	6	13	8	6	12	7	5	11	6	4
		27-45	Interior	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	14	12	13	13	10	12	12	9	12	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	14	9	14	12	7	12	10	6	10	9	6	9	8	5
	C	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	8	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7	9	7	6	9	6	5	8	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	7	6	10	6	5	8	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	12	8	12	10	7	11	9	6	11	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	13	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	13	13	12	10	12	12	8	11	11	7	10	10	6	10	9	5
			Exposed	15	15	15	15	15	15	15	15	13	15	15	12	15	15	11	15	15	9	14	14	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8	6	10	7	5	9	6	4	9	6	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	10	7	10	8	6	10	7	5	8	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	10	8	7	10	7	6	9	6	5	8	5	4	7	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	10	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	10	7	12	9	6	11	7	5	11	7	4	10	6	4
			Exposed	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	10	7	13	9	6	13	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	14	14	11	13	13	9	12	12	8	11	11	7	11	9	6	9	8	5	8	7	4	7	6	3
			Exposed	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	14	12	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
50	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	10	10	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	7	11	10	6	11	8	6	11	7	5	10	6	4
		27-45	Interior	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	12	12	12	12	10	11	11	9	10	10	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	9	12	12	7	12	10	6	10	9	6	9	8	5	8	7	5
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	5	8	6	4	8	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	10	10	7	10	9	6	9	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	7	11	11	7	11	9	6	11	8	5	10	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	11	11	10	11	11	8	10	10	7	9	9	6	9	9	5
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	13	8	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	9	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	8	6	9	7	5	8	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	8	7	6	8	6	5	8	5	4	7	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	11	10	7	10	9	6	10	7	5	9	7	4	9	6	4
			Exposed	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	9	6	12	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	13	13	13	11	12	12	9	11	11	8	10	10	7	10	9	6	9	8	5	8	7	4
			Exposed	14	14	14	14	14	12	14	14	11	14	14	10	13	13	9	13	12	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	7	6	4
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	8	9	9	7	9	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	8	6	9	7	5	9	6	4
		27-45	Interior	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	10	10	10	10	10	9	10	10	8
			Exposed	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	9	11	11	7	10	10	6	10	9	6	9	8	5
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	4	3	6	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	6	6	5	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	9	8	5	9	7	4	9	6	4	8	5	3	8	4	3
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4	7	6	4	6	4	6	6	6	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	6	5	7	5	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	7	5	8	7	4	8	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	9	6	9	8	5	10	6	4	9	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	11	9	10	10	8	9	9	7	9	9	6	8	8	5	8	7	4
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	11	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	9	9	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	6	9	8	5
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	4	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	7	8	8	6	8	8	5	8	6	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	6	9	8	5	8	7	4
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	4	6	4	3	6	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	5	4	6	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	4	7	5	4	6	4	3	5	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	7	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	6	4	8	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	9	9	9	8	9	9	7	8	8	6	8	8	5	7	7	4
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	10	10	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	6	7	7	5	7	6	4	7	6	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	6	8	8	5
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	7	7	7	6	7	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	3	6	5	3	5	4	3	5	3	2	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	4	7	5	3	7	4	3	6	4	2	6	4	2	5	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	6	4	6	6	3
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4		
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7			
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	7	7	5			
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	6	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3	6	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	7	7	7	6	7	7	5	6	6	4	
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4			
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5			
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	5			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4	6	6	4			
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	5	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	6	4	2	6	4	2			
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	6	6	6	5	6	6	4	
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	8	8	5	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	3	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	8	6	9	7	5	8	6	4	8	5	3	8	5	3	7	4	3
			Exposed	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	5	9	6	4	9	5	4	8	5	3	7	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	6	8	8	5	7	7	4	7	6	3	6	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	9	6	9	8	5	8	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	6	4	3	6	4	3	5	3	2	4	3	2
			Exposed	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	8	6	9	7	5	9	6	4	8	5	3	8	4	3	7	4	2	6	3	2
			Exposed	9	9	7	9	9	6	9	8	5	9	7	5	9	6	4	9	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	5	2	1	4	2	1
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	10	10	8	10	10	7	9	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	11	11	8	11	11	7	11	10	6	10	9	6	9	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
40	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	7	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	7	8	8	6	7	7	5	7	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	3	5	4	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	6	5	3	5	4	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	7	8	8	6	7	7	5	7	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	5	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	6	4	3	5	3	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4	7	5	3	7	4	3	6	4	2	6	3	2
			Exposed	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	6	4	8	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
50	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	2	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5	6	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	4	7	6	4	6	5	3	5	5	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	5	4	2	5	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	4	4	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	5	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	4	6	5	3	6	4	2	6	3	2	5	3	2	5	2	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	6	6	5	6	6	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	5	7	7	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	3	2	3	2	1	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	6	5	3	6	4	2	5	3	2	5	3	2
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	6	3	2	4	2	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	6	6	5	6	6	4	6	6	3	5	5	3	5	4	2
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	8	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	4	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4	6	5	3	5	5	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2	4	3	2	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5	5	4	5	5	3	5	5	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	4	6	5	3	5	4	2	5	3	2	5	3	2	5	2	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	5	6	6	5	5	5	3	5	5	3	5	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	6	6	4	6	6	3	6	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	3	5	4	3	5	4	2	5	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2	5	3	2	4	2	1	4	2	1	4	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	5	6	6	4	5	5	3	5	5	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	7	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
70	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	5	5	3	5	5	3	5	5	3
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	2	5	3	2	4	3	2	4	2	2	4	3	2	4	2	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5	5	4	5	5	3	5	5	3	5	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	5	5	3	5	4	2	4	4	2	4	4	2	4	3	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	2	4	2	2	4	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	2	4	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	4	2	4	3	2	4	3	2	4	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	4	5	5	3	5	5	3	4	4	2
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5	6	6	4	6	6	4	6	6	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1
80	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	3	2	4	3	2	4	2	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	2	4	4	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	2	4	3	2	4	3	2	4	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	4	4	4	3	4	4	3	4	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	5	5	3	5	5	3	5	4	2	4	4	2	3	3	2	3	3	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3	4	4	3
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	2	2	3	2	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	4	2	4	3	2
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	4	2	1	4	2	1	4	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	4	4	2	4	4	2	3	3	2	3	3	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	3	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	2	3	2	2	3	2	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	3	2
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	3	3	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2	4	3	2	4	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	4	4	3	4	4	2	4	4	2	3	3	2	3	3	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	12	12	9	12	11	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	11	7	12	9	7	11	8	6	10	7	5
		7-20	Interior	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	10	12	11	9	12	10	8	12	8	7	12	8	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	11	9	12	9	8	12	8	7	11	7	6	10	6	5	8	5	4
		20-27	Interior	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	10	15	13	9	15	12	8	14	10	7
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	12	15	15	11	15	13	9	15	11	8	15	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	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	15	16	16	13	15	15	11	14	14	9	14	13	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	11	16	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	11	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	10	8	12	9	7	11	8	6	10	7	5	9	6	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	12	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	14	10	15	12	8	14	11	7	14	9	6	13	8	5	12	7	5
			Exposed	15	15	14	15	15	12	15	15	11	15	15	10	15	13	9	15	12	8	15	11	7	15	9	6	14	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	16	16	12	15	15	10	14	13	8	13	12	7	11	10	6	10	9	5
			Exposed	17	17	17	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4
			Exposed	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	10	8	12	8	7	11	7	6	10	6	5	9	5	4	8	5	4
			Exposed	12	12	12	12	12	10	12	11	9	12	10	8	12	9	7	12	8	7	12	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	16	16	16	16	16	16	16	16	14	16	16	13	16	16	12	16	16	10	16	14	10	16	12	8	15	10	7	14	9	6	13	8	5	12	7	4	10	6	4
			Exposed	16	16	12	16	15	10	16	14	9	16	12	8	16	11	7	16	10	7	16	9	6	13	8	5	11	7	4	10	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	18	18	18	18	18	18	18	18	18	18	18	16	18	18	15	17	17	13	17	17	12	15	15	10	14	13	8	12	11	7	11	10	6	9	8	5	8	7	4
			Exposed	18	18	15	18	18	13	18	17	11	17	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
40	B	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	9	7	10	8	6	10	7	5
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	10	6	5	8	5	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	13	12	8	12	10	7	12	8	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	11	8	13	10	7	13	8	6	13	7	5	11	7	4
		27-45	Interior	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	14	13	13	13	11	13	13	9	12	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	11	15	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	9	8	6	9	7	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	10	13	12	8	12	11	7	12	9	6	11	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	13	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	12	13	13	10	12	12	8	11	11	7	11	10	6	10	9	5
			Exposed	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4
			Exposed	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	8	11	11	7	11	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	8	7	10	7	6	10	6	5	9	5	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	14	10	14	12	8	13	10	7	12	9	6	11	8	5	11	7	4	10	6	4
			Exposed	14	14	12	14	14	10	14	14	9	14	12	8	14	11	7	14	10	7	14	9	6	13	8	5	11	7	4	10	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	13	15	15	12	13	13	10	13	13	8	12	11	7	11	10	6	9	8	5	8	7	4
			Exposed	16	16	15	16	16	13	16	16	11	16	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
50	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	7	5
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	10	10	7	9	9	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	11	7	5	10	7	4
		27-45	Interior	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	12	12	12	12	11	11	11	9	11	11	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	9	12	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	5	8	6	4	8	6	4	7	5	3
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	8	8	6	8	7	5	7	6	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	6	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	11	11	7	10	9	6	10	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	9	6	11	8	5	11	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	10	11	11	8	10	10	7	10	10	6	9	9	5	8	7	4
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	12	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	8	7	9	7	6	8	6	5	8	5	4	8	5	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	7	10	8	6	9	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	10	12	12	8	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	9	6	12	8	5	11	7	4	10	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	12	12	12	10	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	13	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	7	4	7	7	4
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	8	6	10	7	5	9	7	4
		27-45	Interior	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	11	11	11	11	11	11	10	10	9	10	10	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	11	11	8	11	11	6	10	9	6	9	8	5
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	9	6	9	8	5	9	8	5	8	5	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	9	6	4	9	5	3	8	5	3
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	10	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	11	11	7	10	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	7	6	5	7	5	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	9	7	4	8	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4	9	5	3	7	4	3	7	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
70	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	7	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	9	9	6	9	8	5
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	7	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	7	9	9	6	9	9	5	8	7	4	7	7	4	6	6	3	6	6	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	3	6	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	5	4	6	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	7	4	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	9	9	8	9	9	7	8	8	6	8	8	5	7	7	4
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	7	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	9	6	8	8	5
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	5	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	8	8	6	7	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	7	5	3	7	4	3	7	4	2	6	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	7	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	7	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	6	8	8	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	5	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	6	5	3	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	6	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	7	7	6	7	7	5	7	7	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	6	7	7	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	5	3	5	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	6	4	3	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	11	8	13	9	7	11	8	6	10	7	5	9	6	4	8	5	4
			Exposed	13	13	11	13	13	10	13	13	9	13	11	8	13	10	7	13	9	6	12	8	6	10	7	5	8	6	4	7	5	4	6	4	3	5	4	3	5	3	2
		7-20	Interior	13	13	13	13	13	13	13	13	12	13	13	11	13	12	10	13	11	9	13	10	8	13	8	7	11	7	6	9	6	5	8	5	4	7	5	4	6	4	3
			Exposed	13	12	10	13	11	9	13	9	8	13	8	7	12	8	6	11	7	6	10	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2	4	2	2
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	12	8	13	10	7	13	9	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	13	13	11	13	13	9	13	12	8	13	10	7	13	9	6	13	8	6	13	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	12	11	7	10	9	6	9	8	5	8	7	4	7	6	4
			Exposed	13	13	13	13	13	12	13	13	10	13	13	9	13	12	8	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	C	0-7	Interior	13	13	12	13	13	11	13	13	10	13	12	9	13	11	8	13	10	7	13	9	6	11	8	5	9	6	4	8	6	4	7	5	3	6	4	3	5	4	2
			Exposed	13	11	8	13	10	7	12	9	6	11	8	5	10	7	5	9	6	4	8	6	4	7	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	13	13	11	13	11	9	13	10	8	13	9	7	13	8	7	12	7	6	11	7	6	9	6	5	8	5	4	6	4	3	6	4	3	5	3	2	4	3	2
			Exposed	13	8	7	11	7	6	10	6	5	9	6	5	8	5	4	7	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	13	13	12	13	13	10	13	12	9	13	11	8	13	10	7	13	9	6	13	8	6	12	7	5	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	13	10	7	13	9	6	13	8	5	13	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	13	13	13	13	13	13	13	13	11	13	13	10	13	13	9	13	12	8	12	10	7	10	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	13	13	9	13	11	8	11	10	7	10	9	6	9	8	5	8	7	5	8	7	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	13	13	10	13	13	9	13	11	8	13	10	7	13	9	6	12	8	6	11	8	5	9	6	4	8	5	4	6	5	3	6	4	3	5	3	2	4	3	2
			Exposed	13	9	6	11	8	6	10	7	5	9	6	4	8	6	4	7	5	4	7	5	3	6	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	13	11	9	13	9	8	13	8	7	12	8	6	11	7	6	10	6	5	9	6	5	7	5	4	6	4	3	5	3	3	5	3	2	4	2	2	4	2	2
			Exposed	11	7	6	9	6	5	8	5	4	8	5	4	7	4	3	6	4	3	6	4	3	5	3	2	4	2	2	3	2	2	3	2	1	2	1	1	2	1	1
		20-27	Interior	13	13	9	13	12	8	13	10	7	13	9	6	13	8	6	13	8	5	12	7	5	10	6	4	9	5	3	7	4	3	6	4	2	6	3	2	5	3	2
			Exposed	13	8	6	13	7	5	12	7	4	10	6	4	9	5	3	9	5	3	8	4	3	6	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	13	13	12	13	13	10	13	13	9	13	12	8	12	11	7	11	10	6	10	9	6	8	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	3	2
			Exposed	12	11	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
10	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	8	6	9	7	5	9	6	4	8	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	7	5	8	6	4	7	5	4	6	4	3	5	4	3	5	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4	7	5	4	6	4	3
			Exposed	9	9	9	9	9	9	9	9	8	9	8	7	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2	4	2	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	8	12	10	7	12	9	6	12	7	5	11	6	4	10	6	4	9	5	3
			Exposed	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	12	8	6	12	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	7	10	9	6	9	8	5	8	7	4	7	6	4
			Exposed	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	6	4	8	6	4	7	5	3	6	4	3	5	4	2
			Exposed	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5	9	6	4	8	6	4	7	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	7	6	9	7	6	9	6	5	8	5	4	6	4	3	6	4	3	5	3	2	4	3	2
			Exposed	9	8	7	9	7	6	9	6	5	9	6	5	8	5	4	7	5	4	7	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	12	12	12	12	12	10	12	12	9	12	11	8	12	10	7	12	9	6	12	8	6	12	7	5	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	12	10	7	12	9	6	12	8	5	12	7	5	11	6	4	10	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	10	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	12	12	9	12	11	8	11	10	7	10	9	6	9	8	5	8	7	5	8	7	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	5	9	6	4	8	5	4	6	5	3	6	4	3	5	3	2	4	3	2
			Exposed	9	9	6	9	8	6	9	7	5	9	6	4	8	6	4	7	5	4	7	5	3	6	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	9	9	9	9	9	8	9	8	7	9	8	6	9	7	6	9	6	5	9	6	5	7	5	4	6	4	3	5	3	3	5	3	2	4	2	2	4	2	2
			Exposed	9	7	6	9	6	5	8	5	4	8	5	4	7	4	3	6	4	3	6	4	3	5	3	2	4	2	2	3	2	1	3	2	1	3	2	1	3	2	1
		20-27	Interior	12	12	9	12	12	8	12	10	7	12	9	6	12	8	6	12	8	5	12	7	5	10	6	4	9	5	3	7	4	3	6	4	2	6	3	2	5	3	2
			Exposed	12	8	6	12	7	5	12	7	4	10	6	4	9	5	3	9	5	3	8	4	3	6	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	13	13	12	13	13	10	13	13	9	13	12	8	12	11	7	11	10	6	10	9	6	8	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	3	2
			Exposed	12	11	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
20	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	4	3	5	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	5	3	2	4	2	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	9	6	4	9	6	4	9	5	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	5	9	6	4	9	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	5	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	5	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	8	6	9	7	5	9	6	4	9	5	3	8	4	3	7	4	2	6	3	2
			Exposed	9	9	7	9	9	6	9	8	5	9	7	5	9	6	4	9	6	4	9	5	3	8	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	8	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	10	10	9	10	10	8	10	10	7	10	9	6	9	8	5	8	7	5	8	7	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	5	3	3	5	3	2	4	2	2	4	2	2
			Exposed	6	6	6	6	6	5	6	6	4	6	6	4	6	5	4	6	4	3	6	5	3	6	4	3	5	3	2	4	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	5	9	7	5	9	6	4	9	5	3	7	4	3	6	4	2	6	3	2	5	3	2
			Exposed	9	8	6	9	7	5	9	7	4	9	6	4	9	5	3	9	5	3	8	4	3	6	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	9	9	6	8	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	3	2
			Exposed	10	10	7	10	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	6	6	6	5	6	5	4	6	4	3	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3	5	3	3	5	3	2	4	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	5	3	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	3	5	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	6	4	3	6	4	2	4	3	2
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	6	4	7	5	3	7	4	3	7	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	5	7	6	4	6	6	3	5	5	3	5	4	2
			Exposed	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	5	3	3	5	3	2	4	2	2	4	2	2
			Exposed	6	6	6	6	6	5	6	6	4	6	5	4	6	4	3	6	4	3	6	4	3	5	3	2	4	2	2	3	2	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2
			Exposed	8	8	6	8	7	5	8	7	4	8	6	4	8	5	3	8	5	3	8	4	3	6	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	6	7	7	5	7	6	4	6	5	3	5	5	3	5	4	2	4	3	2
			Exposed	9	9	7	9	9	6	9	8	5	8	7	5	8	7	4	7	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
40	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	2	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	5	3	2	4	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	6	4	6	5	3			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	4	4	3	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	5	4	2	5	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2	6	3	2	5	3	2	4	2	1	4	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4	5	5	3	5	4	2
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	4	3	4	4	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	3	3	5	3	2	4	2	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	2	2	3	2	1	3	2	1
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	6	5	3	6	4	3	5	4	2	5	3	2	4	3	2
			Exposed	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	5	3	7	4	3	6	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	6	7	7	5	6	6	4	6	5	3	5	5	3	5	4	2	4	3	2
			Exposed	8	8	7	8	8	6	8	8	5	8	7	5	8	7	4	7	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
50	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	3	5	5	3	5	4	2	4	3	2	3	3	2	4	3	2
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	4	3	2	4	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	4	5	5	3	5	5	3	5	4	3	4	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	3	2	3	3	1
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2	3	2	2	3	2	1	3	2	1
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	4	2	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	4	3	4	3	2	3	2	1	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	5	5	3	5	4	2	5	3	2	4	3	2	4	3	2
			Exposed	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	5	3	6	4	3	5	4	2	5	3	2	5	3	2	4	2	1	4	2	1	3	2	1
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	5	5	5	4	5	5	3	4	4	2	4	3	2	4	3	2
			Exposed	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	4	5	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	5	5	4	5	5	3	5	4	3	4	4	2	4	4	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	3	4	4	3	4	2	3	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	4	3	2	4	3	2	4	2	1	4	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	4	4	3	4	4	3	3	4	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	5	5	3	5	5	3	5	4	2	4	3	2	3	3	2	3	3	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	3	3	2	3	2	2	3	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	4	3	2	4	2	1	4	2	1	3	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
70	B	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	2
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	4	4	3	4	3	2	4	3	2
	C	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2	4	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	4	2	4	3	2	4	3	2	4	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	4	4	2	4	3	2	3	3	2	3	3	2	3	3	1
	D	0-7	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	3	3	3	2	3	2	2	3	2	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	2	2	3	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2	4	3	2
			Exposed	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3	5	4	3	5	4	2	4	3	2	4	2	1	4	2	1	3	2	1	3	2	1
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2
			Exposed	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	6	3	5	5	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
80	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	1	3	3	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	3	2	1	3	2	1	3	2	1
		20-27	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	3	3	3	3	3	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	4	2	2	3	2	1	3	2	1	3	2	1	3	2	1
		27-45	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	3	4	4	3	3	3	2	3	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	3	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	4	3	2	3	3	2	3	2	1	2	2	1
100	B	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2
	C	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	2	1	2	2	1
	D	0-7	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
		7-20	Interior	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Exposed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1
		20-27	Interior	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	2
			Exposed	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	2	3	2	1	3	2	1	3	2	1
		27-45	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	3	2
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	2	3	3	2	3	3	2	3	2	1	2	2	1

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	11	12	12	10	12	12	9	12	11	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	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	10	12	11	9	12	9	8	11	8	6	11	8	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	9	7	12	8	6	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	15	13	9	15	11	8	14	10	7	11	8	6
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	15	10	15	13	9	15	11	7	15	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	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	15	16	16	12	15	15	10	14	14	9	13	13	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	17	17	13	17	16	11	16	14	9	14	12	7	12	10	6	10	9	6	9	8	5
	C	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	9	6	11	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	8	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	10	8	12	8	7	11	7	6	10	6	5	9	6	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	12	7	6	10	6	5	8	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	14	9	15	12	8	14	10	7	13	9	6	13	8	5	12	7	5
			Exposed	15	15	13	15	15	12	15	15	11	15	14	10	15	13	9	15	12	8	15	11	7	15	9	6	13	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	15	15	12	14	14	10	13	13	8	12	11	7	11	10	6	10	9	5
			Exposed	17	17	17	17	17	15	17	17	13	17	17	12	17	16	11	17	15	9	15	14	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	9	7	11	8	6	10	7	5	9	6	4
			Exposed	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	8	12	10	7	11	8	6	10	7	5	8	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	11	8	7	11	7	6	10	6	5	8	5	4	7	5	4
			Exposed	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	11	7	6	10	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	16	14	9	16	12	8	15	10	7	14	9	6	13	7	5	11	7	4	10	6	4
			Exposed	16	16	11	16	15	10	16	13	9	16	12	8	16	11	7	16	10	7	16	9	6	13	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	18	18	18	18	18	18	18	18	18	18	18	16	18	18	14	17	17	13	16	16	11	15	15	9	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4
			Exposed	18	18	14	18	18	12	18	17	11	17	15	10	15	14	9	14	12	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
40	B	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	9	6	10	8	6	10	7	5
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	7	10	8	6	10	7	6	9	6	5	8	5	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	12	11	8	12	10	7	11	9	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	10	13	13	9	13	11	7	13	10	6	13	8	6	12	7	5	11	6	4
		27-45	Interior	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	14	12	13	13	10	12	12	9	12	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	14	9	14	12	7	12	10	6	10	9	6	9	8	5
	C	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	8	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7	9	7	6	9	6	5	8	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	7	6	10	6	5	8	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	12	8	12	10	7	11	9	6	11	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	13	8	5	12	7	4	10	6	4	9	5	3	8	4	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	13	12	13	12	10	11	11	7	10	10	6	10	9	5	10	9	5
			Exposed	15	15	15	15	15	15	15	15	13	15	15	12	15	15	11	15	15	9	14	14	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8	6	10	7	5	9	6	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	10	7	10	8	6	10	7	5	8	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	10	8	7	10	7	6	9	6	5	8	5	4	7	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	10	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	10	7	12	9	6	11	7	5	11	7	4	10	6	4
			Exposed	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	10	7	13	9	6	13	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	14	14	11	13	13	9	12	12	8	11	11	7	11	9	6	9	8	5	8	7	4	7	6	3
			Exposed	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	14	12	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
50	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	5	4
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	10	10	7	10	9	6	9	8	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	7	11	10	6	11	8	6	11	7	5	10	6	4
		27-45	Interior	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	12	12	12	12	10	11	11	9	10	10	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	9	12	12	7	12	10	6	10	9	6	9	8	5	8	7	5
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	5	8	6	4	8	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	8	10	10	7	10	9	6	9	8	5	9	7	5	8	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	7	11	9	6	11	8	5	10	7	4	10	6	4	9	5	3	8	4	3	7	5	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	10	11	11	8	10	10	7	9	9	6	9	9	5	8	8	5
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	13	8	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	8	6	9	7	5	8	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	8	7	6	8	6	5	8	5	4	7	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	9	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	11	10	7	10	9	6	10	7	5	9	7	4	9	6	4
			Exposed	12	12	11	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	9	6	12	8	5	11	6	4	10	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	13	13	13	11	12	12	9	11	11	8	10	10	7	10	9	6	9	8	5	8	7	4
			Exposed	14	14	14	14	14	12	14	14	11	14	14	10	13	13	9	13	12	8	13	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	9	8	9	9	7	
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	8	6	9	7	5	9	6	4
		27-45	Interior	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	10	10	10	10	10	9	10	10	8
			Exposed	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	9	11	11	7	10	10	6	10	9	6	9	8	5
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	6	6	5	6	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	9	8	5	9	7	4	9	6	4	8	5	3	8	4	3
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	6	5	7	5	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	7	5	8	7	4	8	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	9	6	9	8	5	10	6	4	9	5	4	8	5	3	7	4	3	6	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	11	9	10	10	8	9	9	7	9	9	6	8	8	5	8	7	4
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	11	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	9	9	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	6	9	8	5			
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3			
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	7	8	8	6	8	8	5	8	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4	6	6	3			
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3			
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	5	4	6	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	4	7	5	3	5	3	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	7	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	6	4	8	5	4	8	5	3	7	4	3	6	4	2			
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	9	9	9	8	9	9	7	8	8	6	8	8	5	7	7	4
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	10	10	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	6	8	8	5
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	7	7	6	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3						
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	5	4			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	3	5	4	3	5	3	3	5	3	2			
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4			
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	6	8	8	5	7	5	3	7	4	3	6	4	2						
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	7	4			
			Exposed	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3			

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Micro Rail	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4			
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7				
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	7	7	5			
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	6	7	7	5			
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3			
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	5	3	2			
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3	6	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	7	7	7	6	7	7	5	6	6	4	
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4			
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5			
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3			
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	5			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4	6	6	3
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3			
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4			
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	2			
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	6	4	2						
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	6	6	6	6	5			
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3

Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

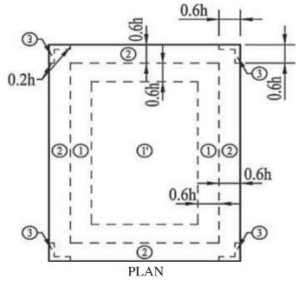
Seismic Design Assumptions

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

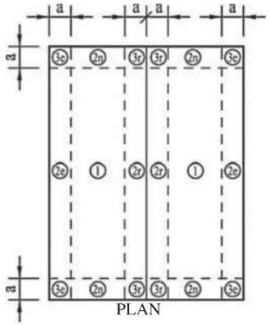
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

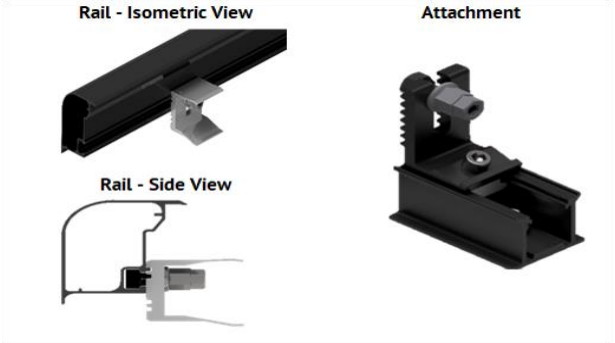
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Trim Rail - SFM Slider

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	113	113	92	113	113	76	113	113	63	113	90	54	113	77	46	113	67	41	96	58	37	74	46	31	58	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	113	77	46	113	64	40	90	55	36	76	47	32	66	42	29	57	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	112	112	81	112	94	65	112	75	53	112	62	45	85	52	40	75	45	36	67	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	85	52	39	73	43	35	64	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	110	110	110	110	110	110	110	110	81	110	86	66	110	72	54	110	61	46	110	52	40	79	41	32	65	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	110	71	54	110	58	44	97	49	38	82	42	33	72	38	29	64	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	107	107	107	107	107	107	107	107	97	107	107	81	107	105	69	107	86	59	107	74	51	72	56	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	107	102	68	107	82	57	94	69	48	76	58	41	63	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	113	86	51	113	72	43	102	61	38	85	52	35	73	46	31	63	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	73	45	31	61	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	112	59	42	80	48	38	70	41	34	61	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	110	81	62	110	66	50	110	55	41	91	46	36	79	41	32	70	37	28	62	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	78	40	31	68	36	27	59	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	107	107	77	107	93	63	107	77	53	88	65	45	72	56	40	60	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	71	55	39	57	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	113	65	40	90	55	36	76	47	32	65	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	74	43	35	64	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	110	59	45	97	49	38	81	42	33	71	37	29	63	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	62	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	107	83	57	94	69	48	75	58	41	62	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
10	B	0-7	Interior	83	83	83	83	83	76	83	83	63	83	83	54	83	77	46	83	67	41	83	58	37	74	46	31	58	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	83	77	46	83	64	40	83	55	36	76	47	32	66	42	29	57	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	83	83	81	83	83	65	83	75	53	83	62	45	83	52	40	75	45	36	67	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	83	52	39	73	43	35	64	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	109	109	109	109	109	109	109	109	81	109	86	66	109	72	54	109	61	46	109	52	40	79	41	32	65	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	109	71	54	109	58	44	97	49	38	82	42	33	72	38	29	64	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	107	107	107	107	107	107	107	107	97	107	107	81	107	105	69	107	86	59	107	74	51	72	56	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	107	102	68	107	82	57	94	69	48	76	58	41	63	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	83	83	51	83	72	43	83	61	38	83	52	35	73	46	31	63	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	73	45	31	61	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	83	59	42	80	48	38	70	41	34	61	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	109	81	62	109	66	50	109	55	41	91	46	36	79	41	32	70	37	28	62	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	78	40	31	68	36	27	59	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	107	107	77	107	93	63	107	77	53	88	65	45	72	56	40	60	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	71	55	39	57	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	83	65	40	83	55	36	76	47	32	65	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	74	43	35	64	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	110	59	45	97	49	38	81	42	33	71	37	29	63	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	62	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	107	83	57	94	69	48	75	58	41	62	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
20	B	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	54	57	57	46	57	57	41	57	57	37	57	46	31	57	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	57	57	46	57	57	40	57	55	36	57	47	32	57	42	29	57	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	53	58	58	45	58	52	40	58	45	36	58	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	58	52	39	58	43	35	58	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	86	86	86	86	86	86	86	86	81	86	86	66	86	72	54	86	61	46	86	52	40	79	41	32	65	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	86	71	54	86	58	44	86	49	38	82	42	33	72	38	29	64	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	81	84	84	69	84	84	59	84	74	51	72	56	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	84	84	68	84	82	57	84	69	48	76	58	41	63	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	57	57	51	57	57	43	57	57	38	57	52	35	57	46	31	57	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	57	45	31	57	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	58	58	42	58	48	38	58	41	34	58	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	86	81	62	86	66	50	86	55	41	86	46	36	79	41	32	70	37	28	62	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	78	40	31	68	36	27	59	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	84	84	77	84	84	63	84	77	53	84	65	45	72	56	40	60	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	71	55	39	57	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	40	57	55	36	57	47	32	57	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	58	43	35	58	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	90	59	45	90	49	38	81	42	33	71	37	29	63	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	62	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	90	83	57	90	69	48	75	58	41	62	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	54	56	56	46	56	56	41	56	56	37	56	46	31	56	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	56	56	46	56	56	40	56	55	36	56	47	32	56	42	29	56	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	53	58	58	45	58	52	40	58	45	36	58	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	58	52	39	58	43	35	58	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	54	66	61	46	66	52	40	66	41	32	65	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	66	66	54	66	58	44	66	49	38	66	42	33	66	38	29	64	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	59	61	61	51	61	56	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	61	61	61	61	61	57	61	61	48	61	58	41	61	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	56	56	51	56	56	43	56	56	38	56	52	35	56	46	31	56	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	56	45	31	56	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	58	58	42	58	48	38	58	41	34	58	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	66	66	62	66	66	50	66	55	41	66	46	36	66	41	32	66	37	28	62	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	66	40	31	66	36	27	59	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	61	61	61	61	61	61	61	61	53	61	61	45	61	56	40	60	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	61	55	39	57	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	40	57	55	36	57	47	32	57	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	58	43	35	58	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	72	59	45	72	49	38	72	42	33	71	37	29	63	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	62	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	67	67	57	67	67	48	67	58	41	62	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
40	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	37	46	46	31	46	38	27	46	33	23	40	29	20	35	25	18	31	22	16
			Exposed	46	46	46	46	46	40	46	46	36	46	46	32	46	42	29	46	38	27	46	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	45	49	49	40	49	45	36	49	40	33	49	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	49	49	39	49	43	35	49	38	31	49	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	40	51	41	32	51	35	26	51	30	21	46	26	18	40	23	16	35	20	14
			Exposed	51	51	51	51	51	44	51	49	38	51	42	33	51	38	29	51	34	26	51	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	40	48	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	48	48	48	48	48	48	48	48	48	48	48	41	48	48	36	48	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	46	46	46	46	46	43	46	46	38	46	46	35	46	46	31	46	41	28	46	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	46	45	31	46	40	28	46	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	49	49	42	49	48	38	49	41	34	49	37	30	49	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	49	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	51	51	51	51	51	50	51	51	41	51	46	36	51	41	32	51	37	28	51	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	51	40	31	51	36	27	51	32	24	51	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	45	48	48	40	48	48	35	48	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	48	48	39	48	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	50	50	40	50	50	36	50	47	32	50	41	29	50	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	50	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	53	43	35	53	38	31	53	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	56	56	45	56	49	38	56	42	33	56	37	29	56	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	56	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	53	53	53	53	53	48	53	53	41	53	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
50	B	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	31	38	38	27	38	33	23	38	29	20	35	25	18	31	22	16
			Exposed	38	38	38	38	38	38	38	38	36	38	38	32	38	38	29	38	38	27	38	34	24	38	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	40	41	41	36	41	40	33	41	34	28	41	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	41	41	39	41	41	35	41	38	31	41	34	28	41	31	26	41	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	41	32	42	35	26	42	30	21	42	26	18	40	23	16	35	20	14
			Exposed	42	42	42	42	42	42	42	42	38	42	42	33	42	38	29	42	34	26	42	31	23	42	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	33	40	38	28	37	33	23	32	29	20	29	26	17
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	32	40	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	35	38	38	31	38	38	28	38	37	26	38	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	38	38	31	38	38	28	38	35	25	38	32	22	38	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	41	41	41	41	41	38	41	41	34	41	37	30	41	33	28	41	30	25	41	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	41	33	27	41	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	42	42	42	42	42	42	42	42	41	42	42	36	42	41	32	42	37	28	42	34	25	42	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	42	40	31	42	36	27	42	32	24	42	29	21	42	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	40	40	39	40	40	34	40	40	30	40	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	42	42	40	42	42	36	42	42	32	42	41	29	42	37	26	42	34	24	42	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	42	37	26	42	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	45	43	35	45	38	31	45	34	28	45	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	46	46	45	46	46	38	46	42	33	46	37	29	46	34	25	46	31	22	46	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	46	34	25	46	30	22	46	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	43	43	43	43	43	43	43	43	41	43	43	36	43	42	32	43	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	43	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	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	23	32	29	20	32	25	18	31	22	16
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	27	32	32	24	32	29	20	32	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	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	29	24	34	25	20	33	22	18	29	19	16	26	17	14
			Exposed	34	34	34	34	34	34	34	34	31	34	34	28	34	31	26	34	28	23	34	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	26	35	30	21	35	26	18	35	23	16	35	20	14	23	16	11
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	34	26	35	31	23	35	26	18	35	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	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	28	34	33	23	32	29	20	29	26	17
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	29	34	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	32	26	32	31	22	32	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	32	32	31	32	32	28	32	32	25	32	32	22	32	29	20	32	26	19	32	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	30	34	33	28	34	30	25	34	28	23	34	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	34	33	27	34	30	24	34	27	22	34	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	28	35	34	25	35	28	20	35	24	17	35	21	14	31	18	12	28	16	11	24	14	10
			Exposed	35	35	31	35	35	27	35	32	24	35	29	21	35	26	18	35	24	16	35	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	34	34	34	34	34	34	34	34	30	34	34	27	34	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	35	35	35	35	35	35	35	35	32	35	35	29	35	35	26	35	34	24	35	31	22	35	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	35	35	26	35	33	23	35	30	21	35	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	38	38	35	38	38	31	38	34	28	38	31	25	38	28	23	38	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	38	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	39	39	39	39	39	38	39	39	33	39	37	29	39	34	25	39	31	22	39	28	20	39	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	39	34	25	39	30	22	39	27	19	39	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	36	37	37	32	37	37	29	37	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	37	37	32	37	37	28	37	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
70	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	20	27	25	18	27	22	16
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	20	27	25	17	27	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	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	29	24	30	25	20	30	22	18	29	19	16	26	17	14
			Exposed	30	30	30	30	30	30	30	30	30	30	30	28	30	30	26	30	28	23	30	26	21	30	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	30	21	31	26	18	31	23	16	31	20	14	23	16	11
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	23	31	26	18	31	23	15	31	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	23	29	29	20	29	26	17
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	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	19	27	23	16	27	20	14	24	18	12	22	16	11
			Exposed	27	27	27	27	27	27	27	27	25	27	27	22	27	27	20	27	26	19	27	24	17	27	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	28	23	30	23	19	30	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	30	30	27	30	30	24	30	27	22	30	24	20	30	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	28	20	31	24	17	31	21	14	31	18	12	28	16	11	24	14	10
			Exposed	31	31	31	31	31	27	31	31	24	31	29	21	31	26	18	31	24	16	31	22	15	31	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	29	29	29	29	29	29	29	29	29	29	29	27	29	29	24	29	29	21	29	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	30	24	30	30	22	30	26	18	30	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	30	30	26	30	30	23	30	30	21	30	27	19	30	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	33	33	33	33	33	31	33	33	28	33	31	25	33	28	23	33	25	21	33	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	33	28	23	33	25	20	33	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	34	34	34	34	34	34	34	34	33	34	34	29	34	34	25	34	31	22	34	28	20	34	24	16	34	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	34	34	25	34	30	22	34	27	19	34	24	17	34	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26	32	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	32	32	32	32	32	28	32	32	24	32	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
80	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	18	24	22	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	17	24	21	15	24	19	13	23	16	12	20	15	10
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	24	26	25	20	26	22	18	26	19	16	26	17	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	21	26	22	18	26	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	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	26	27	27	21	27	26	18	27	23	16	27	20	14
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	26	18	27	23	15	27	20	13	27	17	12	26	15	10	23	13	9
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	20	26	26	17
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	20	26	25	17	24	21	14	21	19	12	19	17	11	19	17	11
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	12	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	24	19	24	24	17	24	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	23	19	26	20	17	26	17	14	23	15	12	20	13	11	18	12	10
			Exposed	26	26	26	26	26	24	26	26	22	26	24	20	26	22	18	26	20	16	26	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	20	27	24	17	27	21	14	27	18	12	27	16	11	24	14	10	24	14	10
			Exposed	27	27	27	27	27	27	27	27	24	27	27	21	27	26	18	27	24	16	27	22	15	27	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	21	26	26	18	26	23	15	23	20	13	20	18	11	18	11	7
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	21	26	26	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	22	27	26	18	27	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	27	27	26	27	27	23	27	27	21	27	27	19	27	24	17	27	22	15	27	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	29	29	29	29	29	29	29	29	28	29	29	25	29	28	23	29	25	21	29	23	19	29	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	29	28	23	29	25	20	29	22	18	29	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	25	30	30	22	30	28	20	30	24	16	30	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	30	30	25	30	30	22	30	27	19	30	24	17	30	22	15	30	20	14	30	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	28	28	28	28	28	28	28	28	24	28	28	22	28	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
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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
90	B	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	16
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17	21	21	15	21	19	13	21	16	12	20	15	10
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	22	18	23	19	16	23	17	14
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	22	18	23	19	15	23	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	23	16	24	20	14
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	18	24	23	15	24	20	13	24	17	12	24	15	10	23	13	9
		27-45	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17	23	21	14	21	19	12	19	17	11			
	C	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	21	16	21	20	14	21	18	12	21	16	11
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	19	21	21	17	21	20	14	21	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	19	23	20	17	23	17	14	23	15	12	20	13	11	18	12	10
			Exposed	23	23	23	23	23	23	23	23	22	23	23	20	23	22	18	23	20	16	23	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	17	24	21	14	24	18	12	24	16	11	24	14	10
			Exposed	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	24	16	24	22	15	24	18	13	24	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	18	23	23	15	23	20	13	20	18	11
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7			
	D	0-7	Interior	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	22	16	24	19	14	23	17	12	20	15	10	18	13	9
			Exposed	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	15	24	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	25	21	26	23	19	26	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	26	26	23	26	25	20	26	22	18	26	20	17	26	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	22	27	27	20	27	24	16	27	20	14	27	18	12	26	15	10	23	13	9	20	12	8
			Exposed	27	27	25	27	27	22	27	27	19	27	24	17	27	22	15	27	20	14	27	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	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	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	25	25	25	25	25	25	25	25	24	25	25	22	25	25	19	25	25	17	25	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
100	B	0-7	Interior	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	19	19	19	19	19	19	18	19	19	16
			Exposed	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	17	19	19	15	19	19	13	19	16	12	19	15	10
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	19	16	21	17	14
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	19	15	21	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	16	22	20	14
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	18	22	22	15	22	20	13	22	17	12	22	15	10	22	13	9
		27-45	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17	21	21	14	21	19	12	19	17	11			
	C	0-7	Interior	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	16	19	19	14	19	18	12	19	16	11
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	14	19	17	12	19	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	20	17	21	17	14	21	15	12	20	13	11	18	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	20	16	21	18	15	21	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	17	22	21	14	22	18	12	22	16	11	22	14	10
			Exposed	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	16	22	22	15	22	18	13	22	16	11	22	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	21	15	21	20	13	19	17	11	17	15	9	15	13	8
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	21	16	21	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	16	21	19	14	21	17	12	20	15	10	18	13	9			
			Exposed	21	21	21	21	21	21	21	21	21	21	21	19	21	21	17	21	21	15	21	20	14	21	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	20	16	23	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	23	23	23	23	23	20	23	22	18	23	20	17	23	18	15	23	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	24	16	24	20	14	24	18	12	24	15	10	23	13	9	20	12	8
			Exposed	24	24	24	24	24	22	24	24	19	24	24	17	24	22	15	24	20	14	24	18	12	24	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	17	23	22	15	22	19	12	19	17	11	17	15	9
			Exposed	23	23	23	23	23	23	23	23	23	23	23	22	23	23	19	23	23	17	23	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	188	188	188	188	188	188	188	188	188	188	188	188	188	188	105	188	188	76	188	155	63	188	91	53	158	64	45	96	55	39	69	48	34	59	43	30	52	38	27
			Exposed	188	188	103	188	188	70	188	131	60	188	96	54	188	76	49	149	63	45	109	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	187	187	187	187	187	187	187	187	187	187	187	187	187	187	71	187	187	60	187	74	55	187	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	187	187	70	187	187	59	187	64	53	187	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	170	185	79	53	185	58	44	121	50	36	82	44	31	67	39	26	59	34	24
			Exposed	185	185	185	185	185	185	185	185	65	185	89	55	185	63	48	185	58	43	185	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	74	179	97	55	179	63	46	62	55	40	54	49	34	48	43	30
			Exposed	179	179	179	179	179	179	179	179	179	179	179	80	179	179	61	179	92	55	179	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	188	188	159	188	188	88	188	177	65	188	118	58	188	90	53	188	72	48	139	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	188	89	52	188	68	47	119	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	187	187	187	187	187	63	187	87	57	187	62	51	187	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	187	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	185	185	185	185	185	185	185	185	180	185	185	61	185	78	53	185	62	47	185	57	42	93	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	185	76	53	185	60	46	185	54	40	103	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	179	179	179	179	179	179	179	179	179	179	179	114	179	179	73	179	144	59	179	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	179	179	72	179	116	58	179	74	51	179	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	188	188	72	188	132	60	188	96	54	188	74	49	142	63	44	104	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	140	62	44	97	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	187	187	59	187	64	53	187	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	185	185	185	185	185	66	185	87	55	185	63	48	185	57	42	150	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	185	57	42	122	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	179	179	179	179	179	179	179	179	79	179	179	61	179	88	54	179	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	179	86	53	179	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
10	B	0-7	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	105	139	139	76	139	139	63	139	91	53	139	64	45	96	55	39	69	48	34	59	43	30	52	38	27
			Exposed	139	139	103	139	139	70	139	131	60	139	96	54	139	76	49	139	63	45	109	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	71	140	140	60	140	74	55	140	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	140	140	70	140	140	59	140	64	53	140	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	170	183	79	53	183	58	44	121	50	36	82	44	31	67	39	26	59	34	24
			Exposed	183	183	183	183	183	183	183	183	65	183	89	55	183	63	48	183	58	43	183	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	74	179	97	55	179	63	46	62	55	40	54	49	34	48	43	30
			Exposed	179	179	179	179	179	179	179	179	179	179	179	80	179	179	61	179	92	55	179	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	139	139	139	139	139	88	139	139	65	139	118	58	139	90	53	139	72	48	139	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	139	89	52	139	68	47	119	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	140	140	140	140	140	63	140	87	57	140	62	51	140	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	140	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	183	183	183	183	183	183	183	183	180	183	183	61	183	78	53	183	62	47	183	57	42	93	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	183	76	53	183	60	46	183	54	40	103	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	179	179	179	179	179	179	179	179	179	179	179	114	179	179	73	179	144	59	179	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	179	179	72	179	116	58	179	74	51	179	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	139	139	72	139	132	60	139	96	54	139	74	49	139	63	44	104	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	139	62	44	97	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	140	140	59	140	64	53	140	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	185	185	185	185	185	66	185	87	55	185	63	48	185	57	42	150	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	185	57	42	122	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	179	179	179	179	179	179	179	179	79	179	179	61	179	88	54	179	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	179	86	53	179	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
20	B	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	76	96	96	63	96	91	53	96	64	45	96	55	39	69	48	34	59	43	30	52	38	27
			Exposed	96	96	96	96	96	70	96	96	60	96	96	54	96	76	49	96	63	45	96	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	71	97	97	60	97	74	55	97	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	97	97	70	97	97	59	97	64	53	97	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	79	53	144	58	44	121	50	36	82	44	31	67	39	26	59	34	24
			Exposed	144	144	144	144	144	144	144	144	65	144	89	55	144	63	48	144	58	43	144	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	74	141	97	55	141	63	46	62	55	40	54	49	34	48	43	30
			Exposed	141	141	141	141	141	141	141	141	141	141	141	80	141	141	61	141	92	55	141	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	96	96	96	96	96	88	96	96	65	96	96	58	96	90	53	96	72	48	96	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	96	89	52	96	68	47	96	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	97	97	97	97	97	63	97	87	57	97	62	51	97	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	97	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	144	144	144	144	144	144	144	144	144	144	144	144	144	144	78	144	144	144	144	144	144	144	79	53	144	58	44	121	50	36	82	44	31	67	39	26	59	34	24
			Exposed	144	144	144	144	144	144	144	144	65	144	89	55	144	63	48	144	58	43	144	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	141	141	141	141	141	141	141	141	141	141	141	141	141	141	73	141	141	59	141	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	141	141	72	141	116	58	141	74	51	141	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	96	96	72	96	96	60	96	96	54	96	74	49	96	63	44	96	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	96	62	44	96	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	97	97	59	97	64	53	97	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	150	150	150	150	150	66	150	87	55	150	63	48	150	57	42	150	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	150	57	42	122	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	150	150	150	150	150	150	150	150	79	150	150	61	150	88	54	150	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	150	86	53	150	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	76	94	94	63	94	91	53	94	64	45	94	55	39	69	48	34	59	43	30	52	38	27
			Exposed	94	94	94	94	94	70	94	94	60	94	94	54	94	76	49	94	63	45	94	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	71	97	97	60	97	74	55	97	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	97	97	70	97	97	59	97	64	53	97	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	79	53	110	58	44	110	50	36	82	44	31	67	39	26	59	34	24
			Exposed	110	110	110	110	110	110	110	110	65	110	89	55	110	63	48	110	58	43	110	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	74	103	97	55	103	63	46	62	55	40	54	49	34	48	43	30
			Exposed	103	103	103	103	103	103	103	103	103	103	103	80	103	103	61	103	92	55	103	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	94	94	94	94	94	88	94	94	65	94	94	58	94	90	53	94	72	48	94	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	94	89	52	94	68	47	94	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	97	97	97	97	97	63	97	87	57	97	62	51	97	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	97	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	110	110	110	110	110	110	110	110	110	110	110	61	110	78	53	110	62	47	110	57	42	93	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	110	76	53	110	60	46	110	54	40	103	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	73	103	103	59	103	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	103	103	72	103	103	58	103	74	51	103	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	96	96	72	96	96	60	96	96	54	96	74	49	96	63	44	96	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	96	62	44	96	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	97	97	59	97	64	53	97	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	120	120	120	120	120	66	120	87	55	120	63	48	120	57	42	120	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	120	57	42	120	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	112	112	112	112	112	112	112	112	79	112	112	61	112	88	54	112	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	112	86	53	112	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
40	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	63	77	77	53	77	64	45	77	55	39	69	48	34	59	43	30	52	38	27
			Exposed	77	77	77	77	77	70	77	77	60	77	77	54	77	76	49	77	63	45	77	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	71	82	82	60	82	74	55	82	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	82	82	70	82	82	59	82	64	53	82	58	48	82	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	79	53	86	58	44	86	50	36	82	44	31	67	39	26	59	34	24
			Exposed	86	86	86	86	86	86	86	86	65	86	86	55	86	63	48	86	58	43	86	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	74	81	81	55	81	63	46	62	55	40	54	49	34	48	43	30
			Exposed	81	81	81	81	81	81	81	81	81	81	80	81	81	81	61	81	81	55	81	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	77	77	77	77	77	77	77	77	65	77	77	58	77	77	53	77	72	48	77	62	44	77	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	77	77	52	77	68	47	77	60	42	77	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	82	82	82	82	82	63	82	82	57	82	62	51	82	56	46	82	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	82	56	46	82	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	61	86	78	53	86	62	47	86	57	42	86	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	86	76	53	86	60	46	86	54	40	86	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	73	81	81	59	81	81	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	81	81	72	81	81	58	81	74	51	81	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	83	83	72	83	83	60	83	83	54	83	74	49	83	63	44	83	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	83	62	44	83	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	88	88	59	88	64	53	88	58	48	88	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	94	94	94	94	94	66	94	87	55	94	63	48	94	57	42	94	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	94	57	42	94	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	88	88	88	88	88	88	88	88	79	88	88	61	88	88	54	88	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	88	86	53	88	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
50	B	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	63	45	63	55	39	63	48	34	59	43	30	52	38	27	46	34	24
			Exposed	63	63	63	63	63	63	63	63	60	63	63	54	63	63	49	63	63	45	63	58	41	63	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	60	69	69	55	69	57	47	69	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	69	69	69	69	69	59	69	64	53	69	58	48	69	52	43	69	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	53	70	58	44	70	50	36	70	44	31	67	39	26	59	34	24
			Exposed	70	70	70	70	70	70	70	70	65	70	70	55	70	63	48	70	58	43	70	53	38	70	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	55	66	63	46	62	55	40	54	49	34	48	43	30
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	66	55	66	66	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	58	63	63	53	63	63	48	63	62	44	63	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	63	63	52	63	63	47	63	60	42	63	54	38	63	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	69	69	69	69	69	63	69	69	57	69	62	51	69	56	46	69	51	42	69	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	69	56	46	69	50	41	69	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	61	70	70	53	70	62	47	70	57	42	70	48	34	70	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	70	70	53	70	60	46	70	54	40	70	49	35	70	44	31	70	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	59	66	66	53	66	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	66	66	66	66	66	58	66	66	51	66	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	70	70	70	70	70	60	70	70	54	70	70	49	70	63	44	70	57	40	70	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	70	62	44	70	56	39	70	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	76	76	59	76	64	53	76	58	48	76	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	77	77	77	77	77	66	77	77	55	77	63	48	77	57	42	77	52	37	77	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	77	57	42	77	51	36	77	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	61	73	73	54	73	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	73	73	53	73	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	45	53	53	39	53	53	48	34	53	43	30	52	38	27
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	53	45	53	53	41	53	49	34	53	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	57	47	58	48	40	58	42	34	56	36	30	49	32	27	44	28	24
			Exposed	58	58	58	58	58	58	58	58	53	58	58	48	58	52	43	58	48	39	58	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	53	59	58	44	59	50	36	59	44	31	59	39	26	59	34	24
			Exposed	59	59	59	59	59	59	59	59	59	59	59	55	59	59	48	59	58	43	59	53	38	59	45	31	59	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	46	56	55	40	54	49	34	48	43	30
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	49	56	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	53	44	53	52	37	53	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	53	53	52	53	53	47	53	53	42	53	53	38	53	49	34	53	44	31	53	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	58	58	58	58	58	58	58	58	57	58	58	51	58	56	46	58	51	42	58	47	39	58	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	58	56	46	58	50	41	58	45	37	58	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	53	59	59	47	59	57	42	59	48	34	59	41	28	59	35	24	53	31	21	47	27	19	41	24	17
			Exposed	59	59	53	59	59	46	59	54	40	59	49	35	59	44	31	59	40	28	59	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	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	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	56	56	56	56	56	56	56	56	51	56	56	45	56	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	59	59	59	59	59	59	59	59	54	59	59	49	59	59	44	59	57	40	59	52	37	59	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	59	59	44	59	56	39	59	50	35	59	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	64	64	59	64	64	53	64	58	48	64	52	43	64	47	39	64	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	64	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	65	65	65	65	65	65	65	65	55	65	63	48	65	57	42	65	52	37	65	47	33	65	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	65	57	42	65	51	36	65	45	32	65	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	61	62	62	54	62	62	48	62	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	62	62	53	62	62	47	62	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
70	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	43	30	46	38	27						
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	41	46	46	34	46	42	30	46	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	48	40	50	42	34	50	36	30	49	32	27	44	28	24			
			Exposed	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	48	39	50	44	36	50	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	50	36	51	44	31	51	39	26	51	34	24			
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	48	51	51	43	51	51	38	51	45	31	51	38	26	51	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	40	49	49	34	48	43	30
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	40	49	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	37	46	45	32	46	39	27	46	34	24	41	30	21	36	26	19
			Exposed	46	46	46	46	46	46	46	46	42	46	46	38	46	46	34	46	44	31	46	40	29	46	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	50	42	50	47	39	50	40	33	50	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	50	50	46	50	50	41	50	45	37	50	40	33	50	37	30	50	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	42	51	48	34	51	41	28	51	35	24	51	31	21	47	27	19	41	24	17
			Exposed	51	51	51	51	51	46	51	51	40	51	49	35	51	44	31	51	40	28	51	37	25	51	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	49	49	49	44	49	49	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	49	49	49	49	49	49	49	49	49	49	49	45	49	49	40	49	49	36	49	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	49	51	51	44	51	51	40	51	51	37	51	44	31	51	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	51	51	44	51	51	39	51	50	35	51	45	32	51	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	55	55	55	55	55	53	55	55	48	55	52	43	55	47	39	55	43	35	55	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	55	47	39	55	42	35	55	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	57	57	57	57	57	57	57	57	55	57	57	48	57	57	42	57	52	37	57	47	33	57	40	27	57	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	57	57	42	57	51	36	57	45	32	57	41	28	57	37	25	57	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	48	54	54	43	54	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	54	54	53	54	54	47	54	54	41	54	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34	40	40	30	40	38	27						
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	30	40	36	26	40	32	22	38	28	20	34	25	17
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	42	34	44	36	30	44	32	27	44	28	24			
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	39	44	44	36	44	37	30	44	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	36	45	44	31	45	39	26	45	34	24			
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	38	45	45	31	45	38	26	45	33	23	45	29	20	43	25	17	38	23	15
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	34	43	43	30
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	33	43	41	28	40	36	24	36	32	21	32	28	18			
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34	40	40	30	40	38	27
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	30	40	36	26	40	32	22	38	28	20	34	25	17
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	39	44	40	33	44	34	28	44	29	24	39	26	21	34	23	19	31	20	17
			Exposed	44	44	44	44	44	41	44	44	37	44	40	33	44	37	30	44	33	28	44	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	34	45	41	28	45	35	24	45	31	21	45	27	19	41	24	17
			Exposed	45	45	45	45	45	45	45	45	40	45	45	35	45	44	31	45	40	28	45	37	25	45	31	21	45	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	31	43	39	26	38	34	22	34	30	20			
			Exposed	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	43	32	43	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12			
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	40	45	45	37	45	44	31	45	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	45	45	44	45	45	39	45	45	35	45	45	32	45	41	29	45	37	26	45	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	48	49	49	43	49	47	39	49	43	35	49	39	32	49	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	49	47	39	49	42	35	49	38	31	49	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	48	50	50	42	50	50	37	50	47	33	50	40	27	50	34	23	50	30	20	44	26	18	39	23	16	35	20	14
			Exposed	50	50	42	50	50	36	50	45	32	50	41	28	50	37	25	50	34	23	50	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	48	48	48	48	48	47	48	48	41	48	48	36	48	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	30	36	36	27			
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	30	36	36	26	36	32	22	36	28	20	34	25	17
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	36	30	39	32	27	39	28	24			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	37	30	39	32	26	39	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	36	41	41	31	41	39	26	41	34	24			
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	38	41	41	31	41	38	26	41	33	23	41	29	20	41	25	17	38	23	15
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	30			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	39	28	39	36	24	36	32	21	32	28	18
	C	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	36	27	36	34	24	36	30	21	36	26	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	31	36	36	29	36	34	24	36	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	34	28	39	29	24	39	26	21	34	23	19	31	20	17
			Exposed	39	39	39	39	39	39	39	39	37	39	39	33	39	37	30	39	33	28	39	31	25	39	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	34	41	41	28	41	35	24	41	31	21	41	27	19	41	24	17
			Exposed	41	41	41	41	41	41	41	41	40	41	41	35	41	41	31	41	40	28	41	37	25	41	31	21	41	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	31	39	39	26	38	34	22	34	30	20			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	32	39	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12			
	D	0-7	Interior	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	38	27	40	32	23	39	28	20	34	25	18	30	22	16
			Exposed	40	40	40	40	40	39	40	40	35	40	40	32	40	40	29	40	37	26	40	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	35	43	39	32	43	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	43	43	39	43	42	35	43	38	31	43	34	28	43	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	37	45	45	33	45	40	27	45	34	23	45	30	20	44	26	18	39	23	16	35	20	14
			Exposed	45	45	42	45	45	36	45	45	32	45	41	28	45	37	25	45	34	23	45	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	35	43	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	43	43	43	43	43	43	43	43	41	43	43	36	43	43	32	43	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
100	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27			
			Exposed	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	32	22	33	28	20	33	25	17
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	32	26	35	27	23	35	24	20	32	21	17
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	32	26	35	27	23	35	24	20	32	21	17	28	19	15
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	36	37	37	31	37	37	26	37	34	24			
			Exposed	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	31	37	37	26	37	33	23	37	29	20	37	25	17	37	23	15
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	28	35	35	24	35	32	21	32	28	18						
	C	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	27	33	33	24	33	30	21	33	26	19			
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	24	33	29	21	33	25	18	30	22	16	27	20	14	24	17	12			
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	34	28	35	29	24	35	26	21	34	23	19	31	20	17
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	30	35	33	28	35	31	25	35	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	28	37	35	24	37	31	21	37	27	19	37	24	17
			Exposed	37	37	37	37	37	37	37	37	37	37	37	35	37	37	31	37	37	28	37	37	25	37	31	21	37	27	18	37	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	26	35	34	22	34	30	20			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	26	35	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	36	27	36	32	23	36	28	20	34	25	18	30	22	16
			Exposed	36	36	36	36	36	36	36	36	35	36	36	32	36	36	29	36	36	26	36	34	24	36	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	33	27	39	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	39	39	39	39	39	35	39	38	31	39	34	28	39	31	25	39	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	37	41	41	33	41	40	27	41	34	23	41	30	20	41	26	18	39	23	16	35	20	14
			Exposed	41	41	41	41	41	36	41	41	32	41	41	28	41	37	25	41	34	23	41	31	21	41	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	29	39	37	25	36	33	21	32	29	18	28	25	16
			Exposed	39	39	39	39	39	39	39	39	39	39	39	36	39	39	32	39	39	29	39	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	94	94	77	94	94	64	94	89	53	94	75	45	94	65	39	94	56	34	81	49	31	62	38	26	49	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	94	64	39	90	54	33	75	46	30	64	40	27	55	35	24	48	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	94	94	68	94	79	54	94	63	45	94	52	37	72	44	33	63	37	30	56	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	71	43	33	61	36	29	53	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	93	93	93	93	93	88	93	89	68	93	72	55	93	60	46	93	51	38	88	44	33	66	34	27	54	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	93	60	45	93	49	37	81	41	31	68	35	27	60	32	24	53	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	89	89	89	89	89	89	89	89	82	89	89	68	89	85	57	89	72	49	87	62	43	61	47	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	89	84	57	89	69	47	79	58	40	63	49	34	52	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	94	72	43	94	60	36	85	51	32	72	44	29	61	38	26	53	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	61	38	26	51	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	94	49	35	67	40	32	58	34	28	51	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	93	68	52	93	55	42	92	46	35	77	39	30	66	34	26	59	31	23	52	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	66	34	26	57	30	23	49	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	89	89	64	89	78	53	89	65	45	74	55	38	60	47	33	50	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	60	46	33	48	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	91	55	34	76	46	30	64	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	62	36	30	53	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	93	50	37	81	41	32	68	35	27	60	31	24	53	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	52	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	89	70	48	79	58	40	63	48	34	52	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
10	B	0-7	Interior	69	69	69	69	69	64	69	69	53	69	69	45	69	65	39	69	56	34	69	49	31	62	38	26	49	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	69	64	39	69	54	33	69	46	30	64	40	27	55	35	24	48	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	70	70	68	70	70	54	70	63	45	70	52	37	70	44	33	63	37	30	56	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	70	43	33	61	36	29	53	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	91	91	91	91	91	88	91	89	68	91	72	55	91	60	46	91	51	38	88	44	33	66	34	27	54	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	91	60	45	91	49	37	81	41	31	68	35	27	60	32	24	53	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	89	89	89	89	89	89	89	89	82	89	89	68	89	85	57	89	72	49	87	62	43	61	47	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	89	84	57	89	69	47	79	58	40	63	49	34	52	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	69	69	43	69	60	36	69	51	32	69	44	29	61	38	26	53	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	61	38	26	51	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	70	49	35	67	40	32	58	34	28	51	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	91	68	52	91	55	42	91	46	35	77	39	30	66	34	26	59	31	23	52	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	66	34	26	57	30	23	49	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	89	89	64	89	78	53	89	65	45	74	55	38	60	47	33	50	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	60	46	33	48	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	69	55	34	69	46	30	64	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	62	36	30	53	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	93	50	37	81	41	32	68	35	27	60	31	24	53	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	52	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	89	70	48	79	58	40	63	48	34	52	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
20	B	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	45	48	48	39	48	48	34	48	48	31	48	38	26	48	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	48	48	39	48	48	33	48	46	30	48	40	27	48	35	24	48	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	49	49	49	49	49	49	49	49	45	49	49	37	49	44	33	49	37	30	49	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	49	43	33	49	36	29	49	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	72	72	72	72	72	72	72	72	68	72	72	55	72	60	46	72	51	38	72	44	33	66	34	27	54	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	72	60	45	72	49	37	72	41	31	68	35	27	60	32	24	53	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	68	70	70	57	70	70	49	70	62	43	61	47	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	70	70	57	70	69	47	70	58	40	63	49	34	52	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	48	48	43	48	48	36	48	48	32	48	44	29	48	38	26	48	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	48	38	26	48	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	49	49	35	49	40	32	49	34	28	49	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	72	68	52	72	55	42	72	46	35	72	39	30	66	34	26	59	31	23	52	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	66	34	26	57	30	23	49	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	70	70	64	70	70	53	70	65	45	70	55	38	60	47	33	50	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	60	46	33	48	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	46	30	48	39	27	48	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	36	30	49	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	75	50	37	75	41	32	68	35	27	60	31	24	53	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	52	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	75	70	48	75	58	40	63	48	34	52	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	45	47	47	39	47	47	34	47	47	31	47	38	26	47	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	47	47	39	47	47	33	47	46	30	47	40	27	47	35	24	47	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	49	49	49	49	49	49	49	49	45	49	49	37	49	44	33	49	37	30	49	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	49	43	33	49	36	29	49	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	46	55	51	38	55	44	33	55	34	27	54	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	55	55	45	55	49	37	55	41	31	55	35	27	55	32	24	53	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	43	51	47	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	51	51	51	51	51	47	51	51	40	51	49	34	51	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	47	47	43	47	47	36	47	47	32	47	44	29	47	38	26	47	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	47	38	26	47	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	49	49	35	49	40	32	49	34	28	49	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	55	55	52	55	55	42	55	46	35	55	39	30	55	34	26	55	31	23	52	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	55	34	26	55	30	23	49	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	51	51	51	51	51	51	51	51	45	51	51	38	51	47	33	50	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	51	46	33	48	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	46	30	48	39	27	48	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	36	30	49	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	60	50	37	60	41	32	60	35	27	60	31	24	53	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	52	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	56	56	48	56	56	40	56	48	34	52	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
40	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	31	39	38	26	39	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	39	39	39	39	39	33	39	39	30	39	39	27	39	35	24	39	32	22	39	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	37	41	41	33	41	37	30	41	33	27	41	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	41	41	33	41	36	29	41	32	26	41	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	38	43	43	33	43	34	27	43	29	22	43	25	18	38	22	15	33	19	13	29	17	12
			Exposed	43	43	43	43	43	37	43	41	31	43	35	27	43	32	24	43	29	21	43	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	33	40	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	40	40	40	40	40	40	40	40	40	40	40	34	40	40	30	40	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	39	39	39	39	39	36	39	39	32	39	39	29	39	38	26	39	34	24	39	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	39	38	26	39	33	23	39	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	41	41	35	41	40	32	41	34	28	41	31	25	41	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	41	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	43	43	43	43	43	42	43	43	35	43	39	30	43	34	26	43	31	23	43	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	43	34	26	43	30	23	43	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	38	40	40	30	40	40	30	40	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	40	40	33	40	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	41	41	34	41	41	30	41	39	27	41	34	24	41	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	41	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	44	36	30	44	32	26	44	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	47	47	37	47	41	32	47	35	27	47	31	24	47	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	47	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	44	44	44	44	44	40	44	44	34	44	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
50	B	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	31	22	31	28	19	31	24	17	29	21	15	26	19	13			
			Exposed	31	31	31	31	31	31	31	31	30	31	31	27	31	31	24	31	31	22	31	29	20	31	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	30	34	33	27	34	28	23	34	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	34	34	33	34	34	29	34	32	26	34	29	24	34	26	21	34	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	34	27	35	29	22	35	25	18	35	22	15	33	19	13	29	17	12
			Exposed	35	35	35	35	35	35	35	35	31	35	35	27	35	32	24	35	29	21	35	26	19	35	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	31	23	31	27	20	27	24	17	24	21	15
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	24	31	31	22	31	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	31	31	26	31	31	23	31	30	21	31	27	19	31	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	34	34	34	34	34	32	34	34	28	34	31	25	34	28	23	34	25	21	34	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	34	28	23	34	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	30	35	34	26	35	31	23	35	28	21	35	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	35	34	26	35	30	23	35	27	20	35	24	17	35	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	33	33	33	33	33	29	33	33	25	33	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	35	35	34	35	35	30	35	35	27	35	34	24	35	31	22	35	28	20	35	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	35	31	22	35	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	38	36	30	38	32	26	38	29	24	38	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	6	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	38	38	37	38	38	32	38	35	27	38	31	24	38	28	21	38	26	19	38	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	38	28	21	38	25	18	38	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	36	36	36	36	36	36	36	36	34	36	36	30	36	35	27	36	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	36	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	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			
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	18	13	18	16	11	18	14	10	17	12	8
		7-20	Interior	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	17	19	18	15	19	16	13	19	14	12			
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	18	15	19	16	13	19	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	19	13	20	17	12			
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	15	20	19	13	20	16	11	20	14	10	20	12	8	19	11	7
		27-45	Interior	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	19	19	19	17	19	19	15			
			Exposed	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	16	19	19	14	19	18	12	18	16	10	16	14	9
	C	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	18	13	18	17	12	18	15	10	18	13	9
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	18	14	18	17	12	18	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	16	19	17	14	19	14	12	19	13	10	17	11	9	15	10	8
			Exposed	19	19	19	19	19	19	19	19	18	19	19	16	19	18	15	19	17	14	19	15	12	19	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	20	14	20	17	12	20	15	10	20	13	9	20	12	8
			Exposed	20	20	20	20	20	20	20	20	20	20	20	17	20	20	15	20	20	14	20	18	12	20	15	10	20	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	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	15	19	19	13	19	17	11	17	15	10
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	19	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6			
	D	0-7	Interior	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	19	13	20	16	11	19	14	10	17	12	9	15	11	8
			Exposed	20	20	20	20	20	19	20	20	17	20	20	16	20	20	14	20	18	13	20	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	21	17	22	19	16	22	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	22	22	19	22	21	17	22	19	15	22	17	14	22	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	22	17	22	20	13	22	17	11	22	15	10	22	13	9	19	11	8	17	10	7
			Exposed	22	22	21	22	22	18	22	22	16	22	20	14	22	18	12	22	17	11	22	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	17	21	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	21	21	21	21	21	21	21	21	20	21	21	18	21	21	16	21	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
100	B	0-7	Interior	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			
			Exposed	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	11	16	14	10	16	12	8
		7-20	Interior	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	17	17	17	15	17	16	13	17	14	12
			Exposed	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	16	13	17	13	11	17	12	10	16	10	8	14	9	7
		20-27	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15	18	18	13	18	17	12			
			Exposed	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	16	11	18	14	10	18	12	8	18	11	7
		27-45	Interior	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	17	17	17	17	17	17	15			
			Exposed	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	16	10	16	14	9	16	13	9
	C	0-7	Interior	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	13	16	16	12	16	15	10	16	13	9
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	14	16	16	12	16	14	10	16	12	9	15	11	8	13	10	7	12	8	6			
		7-20	Interior	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	14	12	17	13	10	17	11	9	15	10	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	17	17	14	17	15	12	17	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	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	14	18	17	12	18	15	10	18	13	9	18	12	8
			Exposed	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	18	14	18	18	12	18	15	10	18	13	9	18	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	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	15	17	17	13	17	17	11	17	15	10
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	13	17	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15	18	18	13	18	16	11	18	14	10	17	12	9	15	11	8
			Exposed	18	18	18	18	18	18	18	18	17	18	18	16	18	18	14	18	18	13	18	17	12	18	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	16	19	16	13	19	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	19	19	19	19	19	17	19	19	15	19	17	14	19	15	12	19	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	13	20	17	11	20	15	10	20	13	9	19	11	8	17	10	7						
			Exposed	20	20	20	20	20	18	20	20	16	20	20	14	20	18	12	20	17	11	20	15	10	20	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	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	18	12	18	16	10	16	14	9	14	13	8
			Exposed	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	19	19	14	19	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	185	185	185	185	185	185	185	185	185	185	185	185	185	185	97	185	185	71	185	143	61	185	86	52	145	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	185	185	95	185	185	66	185	123	59	185	91	53	185	72	48	138	62	44	102	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	65	183	183	59	183	67	54	183	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	183	183	65	183	105	58	183	63	52	183	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	76	181	72	52	181	57	43	108	49	35	79	43	30	65	38	26	58	34	23
			Exposed	181	181	181	181	181	181	181	181	62	181	80	54	181	62	47	181	56	42	145	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	69	175	89	54	175	62	45	60	54	39	53	48	33	47	42	29
			Exposed	175	175	175	175	175	175	175	175	126	175	175	74	175	149	60	175	85	53	175	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	185	185	134	185	185	82	185	161	63	185	111	57	185	85	52	185	69	47	129	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	185	84	51	171	65	46	112	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	183	183	183	183	183	62	183	77	56	183	61	50	183	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	183	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	181	181	181	181	181	181	181	181	173	181	181	59	181	71	52	181	61	46	181	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	181	70	52	181	59	45	181	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	100	175	175	68	175	119	58	175	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	175	175	67	175	103	56	175	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	185	185	68	185	124	59	185	91	53	185	71	48	132	61	43	98	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	130	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	183	183	58	183	63	52	183	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	181	181	181	181	181	63	181	78	54	181	62	47	181	56	41	126	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	181	55	41	109	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	175	175	175	175	175	128	175	175	73	175	134	59	175	81	53	175	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	175	80	52	175	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
10	B	0-7	Interior	135	135	135	135	135	135	135	135	135	135	135	135	135	135	97	135	135	71	135	135	61	135	86	52	135	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	135	135	95	135	135	66	135	123	59	135	91	53	135	72	48	135	62	44	102	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	65	136	136	59	136	67	54	136	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	136	136	65	136	105	58	136	63	52	136	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	76	178	72	52	178	57	43	108	49	35	79	43	30	65	38	26	58	34	23
			Exposed	178	178	178	178	178	178	178	178	62	178	80	54	178	62	47	178	56	42	145	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	69	175	89	54	175	62	45	60	54	39	53	48	33	47	42	29
			Exposed	175	175	175	175	175	175	175	175	126	175	175	74	175	149	60	175	85	53	175	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	135	135	134	135	135	82	135	135	63	135	111	57	135	85	52	135	69	47	129	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	135	84	51	135	65	46	112	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	136	136	136	136	136	62	136	77	56	136	61	50	136	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	136	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	178	178	178	178	178	178	178	178	173	178	178	59	178	71	52	178	61	46	178	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	178	70	52	178	59	45	178	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	100	175	175	68	175	119	58	175	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	175	175	67	175	103	56	175	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	135	135	68	135	124	59	135	91	53	135	71	48	132	61	43	98	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	130	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	136	136	58	136	63	52	136	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	181	181	181	181	181	63	181	78	54	181	62	47	181	56	41	126	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	181	55	41	109	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	175	175	175	175	175	128	175	175	73	175	134	59	175	81	53	175	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	175	80	52	175	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
20	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	71	94	94	61	94	86	52	94	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	94	94	94	94	94	66	94	94	59	94	91	53	94	72	48	94	62	44	94	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	65	95	95	59	95	67	54	95	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	95	95	65	95	95	58	95	63	52	95	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	76	140	72	52	140	57	43	108	49	35	79	43	30	65	38	26	58	34	23
			Exposed	140	140	140	140	140	140	140	140	62	140	80	54	140	62	47	140	56	42	140	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	69	137	89	54	137	62	45	60	54	39	53	48	33	47	42	29
			Exposed	137	137	137	137	137	137	137	137	126	137	137	74	137	137	60	137	85	53	137	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	94	94	94	94	94	82	94	94	63	94	94	57	94	85	52	94	69	47	94	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	94	84	51	94	65	46	94	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	95	95	95	95	95	62	95	77	56	95	61	50	95	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	95	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	140	140	140	140	140	140	140	140	140	140	140	59	140	71	52	140	61	46	140	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	140	70	52	140	59	45	140	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	137	137	137	137	137	137	137	137	137	137	137	100	137	137	68	137	119	58	137	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	137	137	67	137	103	56	137	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	94	94	68	94	94	59	94	91	53	94	71	48	94	61	43	94	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	94	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	95	95	58	95	63	52	95	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	147	147	147	147	147	63	147	78	54	147	62	47	147	56	41	126	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	147	55	41	109	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	146	146	146	146	146	128	146	146	73	146	134	59	146	81	53	146	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	146	80	52	146	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	71	91	91	61	91	86	52	91	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	91	91	91	91	91	66	91	91	59	91	91	53	91	72	48	91	62	44	91	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	65	95	95	59	95	67	54	95	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	95	95	65	95	95	58	95	63	52	95	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	76	108	72	52	108	57	43	108	49	35	79	43	30	65	38	26	58	34	23
			Exposed	108	108	108	108	108	108	108	108	62	108	80	54	108	62	47	108	56	42	108	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	69	100	89	54	100	62	45	60	54	39	53	48	33	47	42	29
			Exposed	100	100	100	100	100	100	100	100	100	100	100	74	100	100	60	100	85	53	100	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	91	91	91	91	91	82	91	91	63	91	91	57	91	85	52	91	69	47	91	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	91	84	51	91	65	46	91	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	95	95	95	95	95	62	95	77	56	95	61	50	95	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	95	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	59	108	71	52	108	61	46	108	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	108	70	52	108	59	45	108	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	68	100	100	58	100	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	100	100	67	100	100	56	100	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	94	94	68	94	94	59	94	91	53	94	71	48	94	61	43	94	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	94	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	95	95	58	95	63	52	95	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	117	117	117	117	117	63	117	78	54	117	62	47	117	56	41	117	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	117	55	41	109	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	109	109	109	109	109	109	109	109	73	109	109	59	109	81	53	109	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	109	80	52	109	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
40	B	0-7	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	71	76	76	61	76	76	52	76	63	44	76	54	38	65	47	33	57	42	29	51	37	26
			Exposed	76	76	76	76	76	66	76	76	59	76	76	53	76	72	48	76	62	44	76	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	65	80	80	59	80	67	54	80	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	80	80	65	80	80	58	80	63	52	80	57	47	80	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	76	84	72	52	84	57	43	84	49	35	79	43	30	65	38	26	58	34	23
			Exposed	84	84	84	84	84	84	84	84	62	84	80	54	84	62	47	84	56	42	84	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	69	79	79	54	79	62	45	60	54	39	53	48	33	47	42	29
			Exposed	79	79	79	79	79	79	79	79	79	79	79	74	79	79	60	79	79	53	79	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	76	76	76	76	76	76	76	76	63	76	76	57	76	76	52	76	69	47	76	61	43	76	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	76	76	51	76	65	46	76	58	41	76	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	80	80	80	80	80	62	80	77	56	80	61	50	80	55	45	80	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	80	55	45	80	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	76	84	72	52	84	57	43	84	49	35	79	43	30	65	38	26	58	34	23
			Exposed	84	70	52	84	59	45	84	53	39	84	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	68	79	79	58	79	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	79	79	67	79	79	56	79	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	81	81	68	81	81	59	81	81	53	81	71	48	81	61	43	81	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	81	61	43	81	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	86	86	58	86	63	52	86	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	92	92	92	92	92	63	92	78	54	92	62	47	92	56	41	92	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	92	55	41	92	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	86	86	86	86	86	86	86	86	73	86	86	59	86	81	53	86	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	86	80	52	86	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
50	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	52	62	62	44	62	54	38	62	47	33	57	42	29	51	37	26			
			Exposed	62	62	62	62	62	62	62	62	59	62	62	53	62	62	48	62	62	44	62	57	40	62	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	59	67	67	54	67	55	46	67	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	67	67	65	67	67	58	67	63	52	67	57	47	67	51	42	67	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	52	69	57	43	69	49	35	69	43	30	65	38	26	58	34	23
			Exposed	69	69	69	69	69	69	69	69	62	69	69	54	69	62	47	69	56	42	69	52	37	69	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	54	65	62	45	60	54	39	53	48	33	47	42	29
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	65	53	65	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	57	62	62	52	62	62	47	62	61	43	62	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	62	62	51	62	62	46	62	58	41	62	53	37	62	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	67	67	67	67	67	62	67	67	56	67	61	50	67	55	45	67	50	41	67	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	67	55	45	67	49	40	67	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	59	69	69	52	69	61	46	69	55	41	69	47	33	69	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	69	69	52	69	59	45	69	53	39	69	48	34	69	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	58	65	65	52	65	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	65	65	65	65	65	56	65	65	50	65	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	68	68	68	68	68	59	68	68	53	68	68	48	68	61	43	68	56	39	68	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	68	61	43	68	54	38	68	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	74	74	58	74	63	52	74	56	46	74	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	75	75	75	75	75	63	75	75	54	75	62	47	75	56	41	75	51	37	75	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	75	55	41	75	49	36	75	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	59	71	71	53	71	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	71	71	52	71	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	44	52	52	38	52	47	33	52	42	29	51	37	26
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	44	52	52	40	52	48	34	52	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	54	57	55	46	57	47	39	57	41	34	55	36	29	48	31	26	43	28	23
			Exposed	57	57	57	57	57	57	57	57	52	57	57	47	57	51	42	57	47	38	57	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	57	43	58	49	35	58	43	30	58	38	26	58	34	23
			Exposed	58	58	58	58	58	58	58	58	58	58	58	54	58	58	47	58	56	42	58	52	37	58	44	30	58	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	45	55	54	39	53	48	33	47	42	29
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	48	55	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	52	43	52	51	36	52	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	52	52	51	52	52	46	52	52	41	52	52	37	52	48	34	52	43	31	52	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	57	57	57	57	57	57	57	57	56	57	57	50	57	55	45	57	50	41	57	46	38	57	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	57	55	45	57	49	40	57	44	36	57	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	46	58	55	41	58	47	33	58	40	27	58	35	24	52	30	21	45	27	18	40	24	16
			Exposed	58	58	52	58	58	45	58	53	39	58	48	34	58	43	30	58	39	27	58	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	43	55	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	55	55	55	55	55	55	55	55	50	55	55	44	55	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	58	58	58	58	58	58	58	58	53	58	58	48	58	58	43	58	56	39	58	51	36	58	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	58	58	43	58	54	38	58	49	34	58	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	62	62	58	62	62	52	62	56	46	62	51	42	62	46	38	62	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	62	46	38	62	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	64	64	64	64	64	63	64	64	54	64	62	47	64	56	41	64	51	37	64	46	33	64	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	64	55	41	64	49	36	64	44	31	64	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	59	61	61	53	61	61	47	61	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	61	61	52	61	61	46	61	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
70	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	38	45	45	33	45	42	29	45	37	26	45	37	26
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	40	45	45	34	45	41	29	45	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	47	39	49	41	34	49	36	29	48	31	26	43	28	23	43	28	23
			Exposed	49	49	49	49	49	49	49	49	49	49	49	47	49	49	42	49	47	38	49	43	35	49	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43	50	49	35	50	43	30	50	38	26	50	34	23	50	34	23
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	42	50	50	37	50	44	30	50	37	25	50	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	45	48	48	39	48	48	33	47	42	29
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	39	48	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	36	45	44	31	45	38	27	45	33	23	40	29	21	36	26	18
			Exposed	45	45	45	45	45	45	45	45	41	45	45	37	45	45	34	45	43	31	45	40	28	45	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	45	49	49	41	49	46	38	49	39	32	49	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	49	49	45	49	49	40	49	44	36	49	40	33	49	36	30	49	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	50	41	50	47	33	50	40	27	50	35	24	50	30	21	45	27	18	40	24	16
			Exposed	50	50	50	50	50	45	50	50	39	50	48	34	50	43	30	50	39	27	50	36	25	50	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	48	48	48	48	48	48	48	48	48	48	48	44	48	48	39	48	48	35	48	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	50	39	50	50	36	50	43	30	50	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	50	50	43	50	50	38	50	49	34	50	44	31	50	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	54	54	54	54	54	52	54	54	46	54	51	42	54	46	38	54	42	35	54	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	54	46	38	54	41	34	54	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	55	55	55	55	55	55	55	55	54	55	55	47	55	55	41	55	51	37	55	46	33	55	39	27	55	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	55	55	41	55	49	36	55	44	31	55	40	27	55	36	25	55	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	47	53	53	42	53	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	53	53	52	53	53	46	53	53	40	53	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	33	40	40	29	40	37	26
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	29	40	35	25	40	31	22	37	27	19	33	24	17
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	41	34	43	36	29	43	31	26	43	28	23	43	28	23
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	38	43	43	35	43	36	30	43	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	35	44	44	30	44	44	26	44	34	23
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	37	44	44	30	44	37	25	44	32	22	44	28	19	42	25	17	38	22	15
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	33	42	42	29
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	33	42	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	31	40	38	27	40	33	23	40	29	21	36	26	18
			Exposed	40	40	40	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	40	28	40	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	38	43	39	32	43	33	27	43	29	24	38	25	21	34	22	18	30	20	16
			Exposed	43	43	43	43	43	40	43	43	36	43	40	33	43	36	30	43	33	27	43	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	33	44	40	27	44	35	24	44	30	21	44	27	18	40	24	16
			Exposed	44	44	44	44	44	44	44	44	39	44	44	34	44	43	30	44	39	27	44	36	25	44	31	21	44	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	35	42	42	32	42	38	25	37	33	22	33	30	19
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	35	42	42	31	42	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	39	44	44	36	44	43	30	44	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	44	44	43	44	44	38	44	44	34	44	44	31	44	40	28	44	36	26	44	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	48	48	48	48	48	48	48	48	46	48	48	42	48	46	38	48	42	35	48	38	32	48	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	48	46	38	48	41	34	48	37	30	48	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	49	37	49	46	33	49	39	27	49	34	23	49	29	20	43	25	17	38	22	15	34	20	14
			Exposed	49	49	41	49	49	36	49	44	31	49	40	27	49	36	25	49	33	23	49	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42	47	47	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	47	47	47	47	47	46	47	47	40	47	47	35	47	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	35	26
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	25	35	31	22	35	27	19	33	24	17
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	29	38	31	26	38	28	23
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	36	30	38	31	25	38	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	38	26	40	34	23
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	30	40	37	25	40	32	22	40	28	19	40	25	17	38	22	15
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	33	38	38	29
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	27	38	35	23	35	31	20	31	28	18
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	27	35	33	23	35	29	21	35	26	18
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	35	28	35	33	24	35	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	32	38	33	27	38	29	24	38	25	21	34	22	18	30	20	16
			Exposed	38	38	38	38	38	38	38	38	36	38	38	33	38	36	30	38	33	27	38	30	25	38	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	33	40	40	27	40	35	24	40	30	21	40	27	18	40	24	16
			Exposed	40	40	40	40	40	40	40	40	39	40	40	34	40	40	30	40	39	27	40	36	25	40	31	21	40	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	30	38	38	25	37	33	22	33	30	19
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	31	38	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12			
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	30	39	37	26	39	32	22	38	28	20	34	24	17	30	22	15
			Exposed	39	39	39	39	39	38	39	39	34	39	39	31	39	39	28	39	36	26	39	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	35	42	38	32	42	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	42	42	38	42	41	34	42	37	30	42	33	27	42	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	33	44	39	27	44	34	23	44	29	20	43	25	17	38	22	15	34	20	14
			Exposed	44	44	41	44	44	36	44	44	31	44	40	27	44	36	25	44	33	23	44	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	35	42	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	42	42	42	42	42	42	42	42	40	42	42	35	42	42	32	42	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
100	B	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	25	32	31	22	32	27	19	32	24	17
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	31	26	35	28	23						
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	31	25	35	27	22	35	23	19	31	21	17	28	18	15
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	30	36	36	26	36	34	23
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	36	25	36	32	22	36	28	19	36	25	17	36	22	15
		27-45	Interior	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	34	34	34	34	34	34	33	34	34	29
			Exposed	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	27	34	34	23	34	31	20	31	28	18
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	27	32	32	23	32	29	21	32	26	18
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	32	24	32	29	20	32	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	33	27	35	29	24	35	25	21	34	22	18	30	20	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	30	35	33	27	35	30	25	35	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	27	36	35	24	36	30	21	36	27	18	36	24	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	34	36	36	30	36	36	27	36	36	25	36	31	21	36	26	18	36	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	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	30	34	34	25	34	33	22	33	30	19
			Exposed	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	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	35	26	35	32	22	35	28	20	34	24	17	30	22	15
			Exposed	35	35	35	35	35	35	35	35	34	35	35	31	35	35	28	35	35	26	35	33	23	35	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	32	27	38	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	38	38	38	38	38	34	38	37	30	38	33	27	38	30	25	38	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	39	27	40	34	23	40	29	20	40	25	17	38	22	15	34	20	14
			Exposed	40	40	40	40	40	36	40	40	31	40	40	27	40	36	25	40	33	23	40	30	21	40	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	29	38	36	24	36	32	21	31	28	18	28	25	16
			Exposed	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	28	38	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	113	113	92	113	113	76	113	113	63	113	90	54	113	77	46	113	67	41	96	58	37	74	46	31	58	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	113	77	46	113	64	40	90	55	36	76	47	32	66	42	29	57	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	112	112	81	112	94	65	112	75	53	112	62	45	85	52	40	75	45	36	67	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	85	52	39	73	43	35	64	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	106	106	106	106	106	106	106	106	81	106	86	66	106	72	54	106	61	46	106	52	40	79	41	32	65	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	106	71	54	106	58	44	97	49	38	82	42	33	72	38	29	64	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	101	101	101	101	101	101	101	101	97	101	101	81	101	101	69	101	86	59	101	74	51	72	56	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	101	101	68	101	82	57	94	69	48	76	58	41	63	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	113	86	51	113	72	43	102	61	38	85	52	35	73	46	31	63	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	73	45	31	61	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	112	59	42	80	48	38	70	41	34	61	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	106	81	62	106	66	50	106	55	41	91	46	36	79	41	32	70	37	28	62	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	78	40	31	68	36	27	59	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	101	101	77	101	93	63	101	77	53	88	65	45	72	56	40	60	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	71	55	39	57	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	113	65	40	90	55	36	76	47	32	65	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	74	43	35	64	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	106	59	45	97	49	38	81	42	33	71	37	29	63	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	62	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	101	83	57	94	69	48	75	58	41	62	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
10	B	0-7	Interior	83	83	83	83	83	76	83	83	63	83	83	54	83	77	46	83	67	41	83	58	37	74	46	31	58	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	83	77	46	83	64	40	83	55	36	76	47	32	66	42	29	57	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	83	83	81	83	83	65	83	75	53	83	62	45	83	52	40	75	45	36	67	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	83	52	39	73	43	35	64	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	92	92	92	92	92	92	92	92	81	92	86	66	92	72	54	92	61	46	92	52	40	79	41	32	65	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	92	71	54	92	58	44	92	49	38	82	42	33	72	38	29	64	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	81	87	87	69	87	86	59	87	74	51	72	56	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	87	87	68	87	82	57	87	69	48	76	58	41	63	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	83	83	51	83	72	43	83	61	38	83	52	35	73	46	31	63	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	73	45	31	61	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	83	59	42	80	48	38	70	41	34	61	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	92	81	62	92	66	50	92	55	41	91	46	36	79	41	32	70	37	28	62	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	78	40	31	68	36	27	59	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	87	87	77	87	87	63	87	77	53	87	65	45	72	56	40	60	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	71	55	39	57	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	83	65	40	83	55	36	76	47	32	65	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	74	43	35	64	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	95	59	45	95	49	38	81	42	33	71	37	29	63	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	62	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	90	83	57	90	69	48	75	58	41	62	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
20	B	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	54	57	57	46	57	57	41	57	57	37	57	46	31	57	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	57	57	46	57	57	40	57	55	36	57	47	32	57	42	29	57	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	53	58	58	45	58	52	40	58	45	36	58	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	58	52	39	58	43	35	58	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	66	71	71	54	71	61	46	71	52	40	71	41	32	65	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	71	71	54	71	58	44	71	49	38	71	42	33	71	38	29	64	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	59	68	68	51	68	56	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	68	68	68	68	68	57	68	68	48	68	58	41	63	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	57	57	51	57	57	43	57	57	38	57	52	35	57	46	31	57	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	57	45	31	57	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	58	58	42	58	48	38	58	41	34	58	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	71	71	62	71	66	50	71	55	41	71	46	36	71	41	32	70	37	28	62	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	71	40	31	68	36	27	59	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	68	68	68	68	68	63	68	68	53	68	65	45	68	56	40	60	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	68	55	39	57	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	40	57	55	36	57	47	32	57	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	58	43	35	58	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	74	59	45	74	49	38	74	42	33	71	37	29	63	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	62	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	71	71	57	71	69	48	71	58	41	62	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	54	56	56	46	56	56	41	56	56	37	56	46	31	56	38	27	47	33	23	40	29	20	35	25	18	31	22	16
			Exposed	56	56	46	56	56	40	56	55	36	56	47	32	56	42	29	56	38	27	50	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	53	58	58	45	58	52	40	58	45	36	58	40	33	54	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	58	52	39	58	43	35	58	38	31	56	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	54	58	58	54	58	58	46	58	52	40	58	41	32	58	35	26	54	30	21	46	26	18	40	23	16	35	20	14
			Exposed	58	58	54	58	58	44	58	49	38	58	42	33	58	38	29	58	34	26	57	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	55	55	40	54	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	55	55	55	55	55	55	55	55	48	55	55	41	55	50	36	53	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	56	56	51	56	56	43	56	56	38	56	52	35	56	46	31	56	41	28	55	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	56	45	31	56	40	28	52	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	58	58	42	58	48	38	58	41	34	58	37	30	54	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	54	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	58	58	58	58	58	50	58	55	41	58	46	36	58	41	32	58	37	28	58	34	25	50	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	58	40	31	58	36	27	58	32	24	52	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	55	55	55	55	55	55	55	55	53	55	55	45	55	55	40	55	48	35	51	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	55	55	39	55	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	40	57	55	36	57	47	32	57	41	29	56	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	56	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	58	43	35	58	38	31	56	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	61	59	45	61	49	38	61	42	33	61	37	29	61	34	25	56	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	61	34	25	54	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	59	59	57	59	59	48	59	58	41	59	49	36	52	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	51	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
40	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	37	46	46	31	46	38	27	46	33	23	40	29	20	35	25	18	31	22	16
			Exposed	46	46	46	46	46	40	46	46	36	46	46	32	46	42	29	46	38	27	46	34	24	40	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	45	49	49	40	49	45	36	49	40	33	49	34	28	45	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	49	49	39	49	43	35	49	38	31	49	34	28	49	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	40	49	41	32	49	35	26	49	30	21	46	26	18	40	23	16	35	20	14
			Exposed	49	49	49	49	49	44	49	49	38	49	42	33	49	38	29	49	34	26	49	31	23	46	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	40	47	44	33	42	38	28	37	33	23	32	29	20	29	26	17
			Exposed	47	47	47	47	47	47	47	47	47	47	47	41	47	47	36	47	43	32	45	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	46	46	46	46	46	43	46	46	38	46	46	35	46	46	31	46	41	28	46	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	46	45	31	46	40	28	46	35	25	45	32	22	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	49	49	42	49	48	38	49	41	34	49	37	30	49	33	28	48	30	25	43	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	49	33	27	47	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	49	49	49	49	49	49	49	49	41	49	46	36	49	41	32	49	37	28	49	34	25	49	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	49	40	31	49	36	27	49	32	24	49	29	21	46	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	45	47	47	40	47	47	35	47	42	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	47	47	39	47	46	34	47	40	30	41	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	50	50	40	50	50	36	50	47	32	50	41	29	50	37	26	49	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	50	37	26	47	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	53	43	35	53	38	31	53	34	28	49	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	52	52	45	52	49	38	52	42	33	52	37	29	52	34	25	52	31	22	50	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	52	34	25	52	30	22	47	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	50	50	50	50	50	48	50	50	41	50	49	36	50	42	32	44	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	50	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
50	B	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	31	38	38	27	38	33	23	38	29	20	35	25	18	31	22	16
			Exposed	38	38	38	38	38	38	38	38	36	38	38	32	38	38	29	38	38	27	38	34	24	38	29	20	34	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	40	41	41	36	41	40	33	41	34	28	41	29	24	38	25	20	33	22	18	29	19	16	26	17	14
			Exposed	41	41	39	41	41	35	41	38	31	41	34	28	41	31	26	41	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	41	32	42	35	26	42	30	21	42	26	18	40	23	16	35	20	14
			Exposed	42	42	42	42	42	42	42	42	38	42	42	33	42	38	29	42	34	26	42	31	23	42	26	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	33	40	38	28	37	33	23	32	29	20	29	26	17
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	32	40	39	29	37	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	35	38	38	31	38	38	28	38	37	26	38	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	38	38	31	38	38	28	38	35	25	38	32	22	38	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	41	41	41	41	41	38	41	41	34	41	37	30	41	33	28	41	30	25	41	28	23	36	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	41	33	27	41	30	24	41	27	22	37	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	42	42	42	42	42	42	42	42	41	42	42	36	42	41	32	42	37	28	42	34	25	42	28	20	42	24	17	36	21	14	31	18	12	28	16	11	24	14	10
			Exposed	42	40	31	42	36	27	42	32	24	42	29	21	42	26	18	41	24	16	38	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	32	40	36	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	40	40	39	40	40	34	40	40	30	40	36	27	37	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	42	42	40	42	42	36	42	42	32	42	41	29	42	37	26	42	34	24	42	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	42	37	26	42	33	23	41	30	21	37	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	45	43	35	45	38	31	45	34	28	45	31	25	43	28	23	39	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	45	45	45	45	45	38	45	42	33	45	37	29	45	34	25	45	31	22	45	28	20	41	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	45	34	25	45	30	22	45	27	19	42	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	43	43	43	43	43	43	43	43	41	43	43	36	43	42	32	43	39	29	39	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	43	42	32	42	38	28	38	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	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	23	32	29	20	32	25	18	31	22	16
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	27	32	32	24	32	29	20	32	25	17	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	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	29	24	34	25	20	33	22	18	29	19	16	26	17	14
			Exposed	34	34	34	34	34	34	34	34	31	34	34	28	34	31	26	34	28	23	34	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	26	35	30	21	35	26	18	35	23	16	35	20	14	23	16	11
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	34	26	35	31	23	35	26	18	35	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	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	28	34	33	23	32	29	20	29	26	17
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	29	34	33	24	32	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	32	26	32	31	22	32	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	32	32	31	32	32	28	32	32	25	32	32	22	32	29	20	32	26	19	32	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	30	34	33	28	34	30	25	34	28	23	34	23	19	31	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	34	33	27	34	30	24	34	27	22	34	24	20	33	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	28	35	34	25	35	28	20	35	24	17	35	21	14	31	18	12	28	16	11	24	14	10
			Exposed	35	35	31	35	35	27	35	32	24	35	29	21	35	26	18	35	24	16	35	22	15	32	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	26	34	30	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	34	34	34	34	34	34	34	34	30	34	34	27	34	33	24	34	30	21	31	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	35	35	35	35	35	35	35	35	32	35	35	29	35	35	26	35	34	24	35	31	22	35	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	35	35	26	35	33	23	35	30	21	35	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	38	38	35	38	38	31	38	34	28	38	31	25	38	28	23	38	25	21	36	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	38	28	23	38	25	20	34	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	39	39	39	39	39	38	39	39	33	39	37	29	39	34	25	39	31	22	39	28	20	39	24	16	35	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	39	34	25	39	30	22	39	27	19	39	24	17	38	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	36	37	37	32	37	37	29	37	35	26	33	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	37	37	32	37	37	28	37	34	24	34	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
70	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	20	27	25	18	27	22	16
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	20	27	25	17	27	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	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	29	24	30	25	20	30	22	18	29	19	16	26	17	14
			Exposed	30	30	30	30	30	30	30	30	30	30	30	28	30	30	26	30	28	23	30	26	21	30	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	30	21	31	26	18	31	23	16	31	20	14	23	16	11
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	23	31	26	18	31	23	15	31	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	23	29	29	20	29	26	17
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	28	20	27	25	17	24	21	14	21	19	12	19	17	11
	C	0-7	Interior	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	19	27	23	16	27	20	14	24	18	12	22	16	11
			Exposed	27	27	27	27	27	27	27	27	25	27	27	22	27	27	20	27	26	19	27	24	17	27	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	28	23	30	23	19	30	20	17	27	17	14	23	15	12	20	13	11	18	12	10
			Exposed	30	30	27	30	30	24	30	27	22	30	24	20	30	22	18	30	20	16	28	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	28	20	31	24	17	31	21	14	31	18	12	28	16	11	24	14	10
			Exposed	31	31	31	31	31	27	31	31	24	31	29	21	31	26	18	31	24	16	31	22	15	31	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	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	21	29	26	18	26	23	15	23	20	13	20	18	11
			Exposed	29	29	29	29	29	29	29	29	29	29	29	27	29	29	24	29	29	21	29	27	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	30	24	30	30	22	30	26	18	30	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	30	30	26	30	30	23	30	30	21	30	27	19	30	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	33	33	33	33	33	31	33	33	28	33	31	25	33	28	23	33	25	21	33	23	19	30	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	33	28	23	33	25	20	33	22	18	31	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	34	34	34	34	34	34	34	34	33	34	34	29	34	34	25	34	31	22	34	28	20	34	24	16	34	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	34	34	25	34	30	22	34	27	19	34	24	17	34	22	15	34	20	14	31	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26	32	30	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	32	32	32	32	32	28	32	32	24	32	31	22	31	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
80	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	18	24	22	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	17	24	21	15	24	19	13	23	16	12	20	15	10
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	24	26	25	20	26	22	18	26	19	16	26	17	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	21	26	22	18	26	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	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	26	27	27	21	27	26	18	27	23	16	27	20	14
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	26	18	27	23	15	27	20	13	27	17	12	26	15	10	23	13	9
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	20	26	26	17
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	20	26	25	17	24	21	14	21	19	12	19	17	11	17	15	11
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	12	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	24	19	24	24	17	24	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	23	19	26	20	17	26	17	14	23	15	12	20	13	11	18	12	10
			Exposed	26	26	26	26	26	24	26	26	22	26	24	20	26	22	18	26	20	16	26	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	20	27	24	17	27	21	14	27	18	12	27	16	11	24	14	10	24	14	10
			Exposed	27	27	27	27	27	27	27	27	24	27	27	21	27	26	18	27	24	16	27	22	15	27	18	13	27	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	21	26	26	18	26	23	15	23	20	13	20	18	11	18	11	8
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	21	26	26	19	26	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	22	27	26	18	27	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	27	27	26	27	27	23	27	27	21	27	27	19	27	24	17	27	22	15	27	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	29	29	29	29	29	29	29	29	28	29	29	25	29	28	23	29	25	21	29	23	19	29	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	29	28	23	29	25	20	29	22	18	29	20	17	28	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	25	30	30	22	30	28	20	30	24	16	30	20	14	30	18	12	26	15	10	23	13	9	20	12	8
			Exposed	30	30	25	30	30	22	30	27	19	30	24	17	30	22	15	30	20	14	30	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	21	28	26	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	28	28	28	28	28	28	28	28	24	28	28	22	28	28	19	28	25	17	26	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
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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
90	B	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	16
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17	21	21	15	21	19	13	21	16	12	20	15	10
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	22	18	23	19	16	23	17	14
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	22	18	23	19	15	23	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	23	16	24	20	14
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	18	24	23	15	24	20	13	24	17	12	24	15	10	23	13	9
		27-45	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17	23	21	14	21	19	12	19	17	11			
	C	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	21	16	21	20	14	21	18	12	21	16	11
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	19	21	21	17	21	20	14	21	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	19	23	20	17	23	17	14	23	15	12	20	13	11	18	12	10
			Exposed	23	23	23	23	23	23	23	23	22	23	23	20	23	22	18	23	20	16	23	18	15	23	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	17	24	21	14	24	18	12	24	16	11	24	14	10
			Exposed	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	24	16	24	22	15	24	18	13	24	16	11	23	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	18	23	23	15	23	20	13	20	18	11
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	16	22	20	13	19	17	11	17	15	9	15	13	8	13	12	7			
	D	0-7	Interior	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	22	16	24	19	14	23	17	12	20	15	10	18	13	9
			Exposed	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	15	24	20	14	23	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	25	21	26	23	19	26	20	16	26	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	26	26	23	26	25	20	26	22	18	26	20	17	26	18	15	25	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	22	27	27	20	27	24	16	27	20	14	27	18	12	26	15	10	23	13	9	20	12	8
			Exposed	27	27	25	27	27	22	27	27	19	27	24	17	27	22	15	27	20	14	27	18	12	27	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	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	17	25	22	15	22	19	12	19	17	11	17	15	9
			Exposed	25	25	25	25	25	25	25	25	24	25	25	22	25	25	19	25	25	17	25	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6
100	B	0-7	Interior	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	19	19	19	19	19	19	18	19	19	16
			Exposed	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	17	19	19	15	19	19	13	19	16	12	19	15	10
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	19	16	21	17	14
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	19	15	21	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	16	22	20	14
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	18	22	22	15	22	20	13	22	17	12	22	15	10	22	13	9
		27-45	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17	21	21	14	21	19	12	19	17	11			
	C	0-7	Interior	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	16	19	19	14	19	18	12	19	16	11
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	14	19	17	12	19	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	20	17	21	17	14	21	15	12	20	13	11	18	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	20	16	21	18	15	21	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	17	22	21	14	22	18	12	22	16	11	22	14	10
			Exposed	22	22	22	22	22	22	22	22	22	22	22	21	22	22	18	22	22	16	22	22	15	22	18	13	22	16	11	22	14	9	20	12	8	18	10	7	16	9	6
		27-45	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	21	15	21	20	13	19	17	11	17	15	9	15	13	8
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	21	16	21	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	16	21	19	14	21	17	12	20	15	10	18	13	9			
			Exposed	21	21	21	21	21	21	21	21	21	21	21	19	21	21	17	21	21	15	21	20	14	21	17	12	20	14	10	17	13	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	20	16	23	17	14	22	15	12	19	13	10	17	11	9	15	10	8
			Exposed	23	23	23	23	23	20	23	22	18	23	20	17	23	18	15	23	17	14	23	15	12	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	24	16	24	20	14	24	18	12	24	15	10	23	13	9	20	12	8
			Exposed	24	24	24	24	24	22	24	24	19	24	24	17	24	22	15	24	20	14	24	18	12	24	15	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	17	23	22	15	22	19	12	19	17	11	17	15	9
			Exposed	23	23	23	23	23	23	23	23	23	23	23	22	23	23	19	23	23	17	23	23	15	22	19	13	19	17	11	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	188	188	188	188	188	188	188	188	188	188	188	188	188	188	105	188	188	76	188	155	63	188	91	53	158	64	45	96	55	39	69	48	34	59	43	30	52	38	27
			Exposed	188	188	103	188	188	70	188	131	60	188	96	54	188	76	49	149	63	45	109	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	187	187	187	187	187	187	187	187	187	187	187	187	187	187	71	187	187	60	187	74	55	187	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	187	187	70	187	187	59	187	64	53	187	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	170	178	79	53	178	58	44	121	50	36	82	44	31	67	39	26	59	34	24
			Exposed	178	178	178	178	178	178	178	178	65	178	89	55	178	63	48	178	58	43	178	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	74	169	97	55	169	63	46	62	55	40	54	49	34	48	43	30
			Exposed	169	169	169	169	169	169	169	169	169	169	169	80	169	169	61	169	92	55	169	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	188	188	159	188	188	88	188	177	65	188	118	58	188	90	53	188	72	48	139	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	188	89	52	188	68	47	119	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	187	187	187	187	187	63	187	87	57	187	62	51	187	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	187	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	178	178	178	178	178	178	178	178	178	178	178	61	178	78	53	178	62	47	178	57	42	93	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	178	76	53	178	60	46	178	54	40	103	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	169	169	169	169	169	169	169	169	169	169	169	114	169	169	73	169	144	59	169	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	169	169	72	169	116	58	169	74	51	169	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	188	188	72	188	132	60	188	96	54	188	74	49	142	63	44	104	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	140	62	44	97	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	187	187	59	187	64	53	187	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	178	178	178	178	178	66	178	87	55	178	63	48	178	57	42	150	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	178	57	42	122	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	169	169	169	169	169	169	169	169	79	169	169	61	169	88	54	169	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	169	86	53	169	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
10	B	0-7	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	105	139	139	76	139	139	63	139	91	53	139	64	45	96	55	39	69	48	34	59	43	30	52	38	27
			Exposed	139	139	103	139	139	70	139	131	60	139	96	54	139	76	49	139	63	45	109	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	71	140	140	60	140	74	55	140	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	140	140	70	140	140	59	140	64	53	140	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	79	53	154	58	44	121	50	36	82	44	31	67	39	26	59	34	24
			Exposed	154	154	154	154	154	154	154	154	65	154	89	55	154	63	48	154	58	43	154	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	74	146	97	55	146	63	46	62	55	40	54	49	34	48	43	30
			Exposed	146	146	146	146	146	146	146	146	146	146	146	80	146	146	61	146	92	55	146	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	139	139	139	139	139	88	139	139	65	139	118	58	139	90	53	139	72	48	139	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	139	89	52	139	68	47	119	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	140	140	140	140	140	63	140	87	57	140	62	51	140	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	140	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	154	154	154	154	154	154	154	154	154	154	154	61	154	78	53	154	62	47	154	57	42	93	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	154	76	53	154	60	46	154	54	40	103	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	146	146	146	146	146	146	146	146	146	146	146	114	146	146	73	146	144	59	146	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	146	146	72	146	116	58	146	74	51	146	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	139	139	72	139	132	60	139	96	54	139	74	49	139	63	44	104	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	139	62	44	97	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	140	140	59	140	64	53	140	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	159	159	159	159	159	66	159	87	55	159	63	48	159	57	42	150	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	159	57	42	122	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	151	151	151	151	151	151	151	151	79	151	151	61	151	88	54	151	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	151	86	53	151	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
20	B	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	76	96	96	63	96	91	53	96	64	45	96	55	39	69	48	34	59	43	30	52	38	27
			Exposed	96	96	96	96	96	70	96	96	60	96	96	54	96	76	49	96	63	45	96	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	71	97	97	60	97	74	55	97	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	97	97	70	97	97	59	97	64	53	97	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	79	53	119	58	44	119	50	36	82	44	31	67	39	26	59	34	24
			Exposed	119	119	119	119	119	119	119	119	65	119	89	55	119	63	48	119	58	43	119	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	74	114	97	55	114	63	46	62	55	40	54	49	34	48	43	30
			Exposed	114	114	114	114	114	114	114	114	114	114	114	80	114	114	61	114	92	55	114	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	96	96	96	96	96	88	96	96	65	96	96	58	96	90	53	96	72	48	96	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	96	89	52	96	68	47	96	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	97	97	97	97	97	63	97	87	57	97	62	51	97	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	97	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	119	119	119	119	119	119	119	119	119	119	119	61	119	78	53	119	62	47	119	57	42	93	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	119	76	53	119	60	46	119	54	40	103	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	73	114	114	59	114	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	114	114	72	114	114	58	114	74	51	114	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	96	96	72	96	96	60	96	96	54	96	74	49	96	63	44	96	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	96	62	44	96	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	97	97	59	97	64	53	97	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	125	125	125	125	125	66	125	87	55	125	63	48	125	57	42	125	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	125	57	42	122	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	119	119	119	119	119	119	119	119	79	119	119	61	119	88	54	119	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	119	86	53	119	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	76	94	94	63	94	91	53	94	64	45	94	55	39	69	48	34	59	43	30	52	38	27
			Exposed	94	94	94	94	94	70	94	94	60	94	94	54	94	76	49	94	63	45	94	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	60	97	74	55	97	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	97	97	70	97	97	59	97	64	53	97	58	48	90	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	79	53	97	58	44	97	50	36	82	44	31	67	39	26	59	34	24
			Exposed	97	97	97	97	97	97	97	97	65	97	89	55	97	63	48	97	58	43	97	53	38	83	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	74	93	93	55	93	63	46	62	55	40	54	49	34	48	43	30
			Exposed	93	93	93	93	93	93	93	93	93	93	93	80	93	93	61	93	92	55	93	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	94	94	94	94	94	88	94	94	65	94	94	58	94	90	53	94	72	48	94	62	44	83	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	94	89	52	94	68	47	94	60	42	88	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	97	97	97	97	97	63	97	87	57	97	62	51	97	56	46	87	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	97	56	46	84	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	61	97	78	53	97	62	47	97	57	42	93	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	97	76	53	97	60	46	97	54	40	97	49	35	82	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	73	93	93	59	93	86	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	93	93	72	93	93	58	93	74	51	93	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	96	96	72	96	96	60	96	96	54	96	74	49	96	63	44	96	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	96	62	44	96	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	97	97	59	97	64	53	97	58	48	89	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	102	102	102	102	102	66	102	87	55	102	63	48	102	57	42	102	52	37	92	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	102	57	42	102	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	98	98	98	98	98	98	98	98	79	98	98	61	98	88	54	98	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	98	86	53	98	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
40	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	77	77	63	77	77	53	77	64	45	77	55	39	69	48	34	59	43	30	52	38	27
			Exposed	77	77	77	77	77	70	77	77	60	77	77	54	77	76	49	77	63	45	77	58	41	70	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	71	82	82	60	82	74	55	82	57	47	79	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	82	82	70	82	82	59	82	64	53	82	58	48	82	52	43	78	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	79	53	81	58	44	81	50	36	81	44	31	67	39	26	59	34	24
			Exposed	81	81	81	81	81	81	81	81	65	81	81	55	81	63	48	81	58	43	81	53	38	81	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74	78	78	55	78	63	46	62	55	40	54	49	34	48	43	30
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	61	78	78	55	78	67	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	77	77	77	77	77	77	77	77	65	77	77	58	77	77	53	77	72	48	77	62	44	77	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	77	77	52	77	68	47	77	60	42	77	54	38	70	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	82	82	82	82	82	63	82	82	57	82	62	51	82	56	46	82	51	42	76	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	82	56	46	82	50	41	71	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	61	81	78	53	81	62	47	81	57	42	81	48	34	73	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	81	76	53	81	60	46	81	54	40	81	49	35	81	44	31	71	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	73	78	78	59	78	78	53	77	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	78	78	72	78	78	58	78	74	51	78	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	83	83	72	83	83	60	83	83	54	83	74	49	83	63	44	83	57	40	82	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	83	62	44	83	56	39	73	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	88	88	59	88	64	53	88	58	48	88	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	87	87	87	87	87	66	87	87	55	87	63	48	87	57	42	87	52	37	87	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	87	57	42	87	51	36	86	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	83	83	83	83	83	83	83	83	79	83	83	61	83	83	54	83	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	83	83	53	83	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
50	B	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	53	63	63	45	63	55	39	63	48	34	59	43	30	52	38	27	46	34	24
			Exposed	63	63	63	63	63	63	63	63	60	63	63	54	63	63	49	63	63	45	63	58	41	63	49	34	58	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	60	69	69	55	69	57	47	69	48	40	64	42	34	56	36	30	49	32	27	44	28	24
			Exposed	69	69	69	69	69	59	69	64	53	69	58	48	69	52	43	69	48	39	68	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	53	70	58	44	70	50	36	70	44	31	67	39	26	59	34	24
			Exposed	70	70	70	70	70	70	70	70	65	70	70	55	70	63	48	70	58	43	70	53	38	70	45	31	65	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	55	66	63	46	62	55	40	54	49	34	48	43	30
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	66	55	66	66	49	62	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	58	63	63	53	63	63	48	63	62	44	63	52	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	63	63	52	63	63	47	63	60	42	63	54	38	63	49	34	61	44	31	56	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	69	69	69	69	69	63	69	69	57	69	62	51	69	56	46	69	51	42	69	47	39	61	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	69	56	46	69	50	41	69	45	37	62	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	61	70	70	53	70	62	47	70	57	42	70	48	34	70	41	28	61	35	24	53	31	21	47	27	19	41	24	17
			Exposed	70	70	53	70	60	46	70	54	40	70	49	35	70	44	31	70	40	28	63	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	59	66	66	53	66	60	44	57	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	66	66	66	66	66	58	66	66	51	66	61	45	62	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	70	70	70	70	70	60	70	70	54	70	70	49	70	63	44	70	57	40	70	52	37	61	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	70	62	44	70	56	39	70	50	35	62	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	76	76	59	76	64	53	76	58	48	76	52	43	76	47	39	66	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	76	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	76	76	76	76	76	66	76	76	55	76	63	48	76	57	42	76	52	37	76	47	33	70	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	76	57	42	76	51	36	76	45	32	73	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	61	73	73	54	73	65	48	72	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	73	73	53	73	63	47	63	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	45	53	53	39	53	53	48	34	53	43	30	52	38	27
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	53	45	53	53	41	53	49	34	53	42	30	50	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	57	47	58	48	40	58	42	34	56	36	30	49	32	27	44	28	24
			Exposed	58	58	58	58	58	58	58	58	53	58	58	48	58	52	43	58	48	39	58	44	36	57	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	53	59	58	44	59	50	36	59	44	31	59	39	26	59	34	24
			Exposed	59	59	59	59	59	59	59	59	59	59	59	55	59	59	48	59	58	43	59	53	38	59	45	31	59	38	26	56	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	46	56	55	40	54	49	34	48	43	30
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	49	56	56	40	53	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	53	44	53	52	37	53	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	53	53	52	53	53	47	53	53	42	53	53	38	53	49	34	53	44	31	53	40	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	58	58	58	58	58	58	58	58	57	58	58	51	58	56	46	58	51	42	58	47	39	58	40	33	52	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	58	56	46	58	50	41	58	45	37	58	40	33	56	37	30	51	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	53	59	59	47	59	57	42	59	48	34	59	41	28	59	35	24	53	31	21	47	27	19	41	24	17
			Exposed	59	59	53	59	59	46	59	54	40	59	49	35	59	44	31	59	40	28	59	37	25	53	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	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	51	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	56	56	56	56	56	56	56	56	51	56	56	45	56	56	40	56	51	36	52	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	59	59	59	59	59	59	59	59	54	59	59	49	59	59	44	59	57	40	59	52	37	59	44	31	52	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	59	59	44	59	56	39	59	50	35	59	45	32	56	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	64	64	59	64	64	53	64	58	48	64	52	43	64	47	39	64	43	35	60	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	64	47	39	64	42	35	58	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	65	65	65	65	65	65	65	65	55	65	63	48	65	57	42	65	52	37	65	47	33	65	40	27	59	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	65	57	42	65	51	36	65	45	32	65	41	28	64	37	25	58	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	61	62	62	54	62	62	48	62	59	43	56	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	62	62	53	62	62	47	62	57	41	57	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
70	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	45	46	46	39	46	46	34	46	43	30	46	38	27
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	41	46	46	34	46	42	30	46	36	26	43	32	22	38	28	20	34	25	17
		7-20	Interior	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	48	40	50	42	34	50	36	30	49	32	27	44	28	24
			Exposed	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	48	39	50	44	36	50	37	30	48	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	50	36	51	44	31	51	39	26	51	34	24	51	34	24
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	48	51	51	43	51	51	38	51	45	31	51	38	26	51	33	23	49	29	20	43	25	17	38	23	15
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	40	49	49	34	48	43	30
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	40	49	48	33	46	41	28	40	36	24	36	32	21	32	28	18
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	37	46	45	32	46	39	27	46	34	24	41	30	21	36	26	19
			Exposed	46	46	46	46	46	46	46	46	42	46	46	38	46	46	34	46	44	31	46	40	29	46	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	50	42	50	47	39	50	40	33	50	34	28	45	29	24	39	26	21	34	23	19	31	20	17
			Exposed	50	50	46	50	50	41	50	45	37	50	40	33	50	37	30	50	33	28	47	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	42	51	48	34	51	41	28	51	35	24	51	31	21	47	27	19	41	24	17
			Exposed	51	51	51	51	51	46	51	51	40	51	49	35	51	44	31	51	40	28	51	37	25	51	31	21	46	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	36	49	44	31	43	39	26	38	34	22	34	30	20
			Exposed	49	49	49	49	49	49	49	49	49	49	49	45	49	49	40	49	49	36	49	46	32	44	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	49	51	51	44	51	51	40	51	51	37	51	44	31	51	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	51	51	44	51	51	39	51	50	35	51	45	32	51	41	29	51	37	26	47	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	55	55	55	55	55	53	55	55	48	55	52	43	55	47	39	55	43	35	55	39	32	51	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	55	47	39	55	42	35	55	38	31	52	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	57	57	57	57	57	57	57	57	55	57	57	48	57	57	42	57	52	37	57	47	33	57	40	27	57	34	23	51	30	20	44	26	18	39	23	16	35	20	14
			Exposed	57	57	42	57	51	36	57	45	32	57	41	28	57	37	25	57	34	23	53	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	48	54	54	43	54	50	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	54	54	53	54	54	47	54	54	41	54	51	36	52	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34	40	40	30	40	38	27
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	30	40	36	26	40	32	22	38	28	20	34	25	17
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	42	34	44	42	34	44	36	30	44	32	27	44	28	24
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	39	44	44	36	44	37	30	44	32	26	42	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	36	45	44	31	45	39	26	45	34	24	45	34	24
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	38	45	45	31	45	38	26	45	33	23	45	29	20	43	25	17	38	23	15
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	34	43	43	30
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	33	43	41	28	40	36	24	36	32	21	32	28	18			
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	32	40	39	27	40	34	24	40	30	21	36	26	19
			Exposed	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	29	40	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	39	44	40	33	44	34	28	44	29	24	39	26	21	34	23	19	31	20	17
			Exposed	44	44	44	44	44	41	44	44	37	44	40	33	44	37	30	44	33	28	44	31	25	40	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	34	45	41	28	45	35	24	45	31	21	45	27	19	41	24	17
			Exposed	45	45	45	45	45	45	45	45	40	45	45	35	45	44	31	45	40	28	45	37	25	45	31	21	45	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	32	43	39	26	37	34	22	32	29	18	28	25	16
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	43	32	43	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	40	45	45	37	45	44	31	45	38	27	45	32	23	39	28	20	34	25	18	30	22	16
			Exposed	45	45	44	45	45	39	45	45	35	45	45	32	45	41	29	45	37	26	45	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	48	49	49	43	49	47	39	49	43	35	49	39	32	49	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	49	47	39	49	42	35	49	38	31	49	34	28	47	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	48	50	50	42	50	50	37	50	47	33	50	40	27	50	34	23	50	30	20	44	26	18	39	23	16	35	20	14
			Exposed	50	50	42	50	50	36	50	45	32	50	41	28	50	37	25	50	34	23	50	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	35	48	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	48	48	48	48	48	47	48	48	41	48	48	36	48	47	32	47	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	30	36	36	27			
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	30	36	36	26	36	32	22	36	28	20	34	25	17
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	36	30	39	32	27	39	28	24			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	37	30	39	32	26	39	27	23	36	24	20	32	21	17	28	19	15
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	36	41	41	31	41	39	26	41	34	24			
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	38	41	41	31	41	38	26	41	33	23	41	29	20	41	25	17	38	23	15
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	30			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	32	39	36	24	36	32	21	32	28	18			
	C	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	36	27	36	34	24	36	30	21	36	26	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	31	36	36	29	36	34	24	36	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	34	28	39	29	24	39	26	21	34	23	19	31	20	17
			Exposed	39	39	39	39	39	39	39	39	37	39	39	33	39	37	30	39	33	28	39	31	25	39	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	34	41	41	28	41	35	24	41	31	21	41	27	19	41	24	17
			Exposed	41	41	41	41	41	41	41	41	40	41	41	35	41	41	31	41	40	28	41	37	25	41	31	21	41	27	18	40	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	31	39	39	26	38	34	22	34	30	20			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	32	39	39	26	37	34	22	32	29	19	28	25	16	25	22	14	22	20	12			
	D	0-7	Interior	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	38	27	40	32	23	39	28	20	34	25	18	30	22	16
			Exposed	40	40	40	40	40	39	40	40	35	40	40	32	40	40	29	40	37	26	40	34	24	39	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	35	43	39	32	43	33	27	43	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	43	43	39	43	42	35	43	38	31	43	34	28	43	31	25	43	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	42	45	45	37	45	45	33	45	40	27	45	34	23	45	30	20	44	26	18	39	23	16	35	20	14
			Exposed	45	45	42	45	45	36	45	45	32	45	41	28	45	37	25	45	34	23	45	31	21	45	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	35	43	43	29	42	37	25	36	33	21	32	29	18	28	25	16
			Exposed	43	43	43	43	43	43	43	43	41	43	43	36	43	43	32	43	42	29	43	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10
100	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27			
			Exposed	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	32	22	33	28	20	33	25	17
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30	35	32	27	35	28	24
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	32	26	35	27	23	35	24	20	32	21	17	28	19	15
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	36	37	37	31	37	37	26	37	34	24
			Exposed	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	31	37	37	26	37	33	23	37	29	20	37	25	17	37	23	15
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	28	35	35	24	35	32	21	32	28	18						
	C	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	27	33	33	24	33	30	21	33	26	19			
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	29	33	33	24	33	29	21	33	25	18	30	22	16	27	20	14	24	17	12			
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	34	28	35	29	24	35	26	21	34	23	19	31	20	17
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	30	35	33	28	35	31	25	35	26	21	34	22	18	29	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	28	37	35	24	37	31	21	37	27	19	37	24	17
			Exposed	37	37	37	37	37	37	37	37	37	37	37	35	37	37	31	37	37	28	37	37	25	37	31	21	37	27	18	37	23	16	35	20	14	30	18	12	27	16	11
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	26	35	34	22	34	30	20			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	26	35	34	22	32	29	19	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	36	27	36	32	23	36	28	20	34	25	18	30	22	16
			Exposed	36	36	36	36	36	36	36	36	35	36	36	32	36	36	29	36	36	26	36	34	24	36	29	20	34	25	17	29	21	15	25	19	13	22	16	12	20	15	10
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	33	27	39	28	23	38	25	20	33	21	18	29	19	16	26	17	14
			Exposed	39	39	39	39	39	35	39	38	31	39	34	28	39	31	25	39	28	23	39	26	21	33	22	18	28	19	15	25	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	37	41	41	33	41	40	27	41	34	23	41	30	20	41	26	18	39	23	16	35	20	14
			Exposed	41	41	41	41	41	36	41	41	32	41	41	28	41	37	25	41	34	23	41	31	21	41	26	18	38	22	15	33	19	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	29	39	37	25	36	33	21	32	29	18	28	25	16
			Exposed	39	39	39	39	39	39	39	39	39	39	39	36	39	39	32	39	39	29	39	39	26	37	33	21	31	28	18	27	24	15	24	21	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	94	94	77	94	94	64	94	89	53	94	75	45	94	65	39	94	56	34	81	49	31	62	38	26	49	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	94	64	39	90	54	33	75	46	30	64	40	27	55	35	24	48	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	94	94	68	94	79	54	94	63	45	94	52	37	72	44	33	63	37	30	56	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	71	43	33	61	36	29	53	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	88	88	88	88	88	88	88	88	68	88	72	55	88	60	46	88	51	38	88	44	33	66	34	27	54	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	88	60	45	88	49	37	81	41	31	68	35	27	60	32	24	53	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	84	84	84	84	84	84	84	84	82	84	84	68	84	84	57	84	72	49	84	62	43	61	47	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	84	84	57	84	69	47	79	58	40	63	49	34	52	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	94	72	43	94	60	36	85	51	32	72	44	29	61	38	26	53	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	61	38	26	51	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	94	49	35	67	40	32	58	34	28	51	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	88	68	52	88	55	42	88	46	35	77	39	30	66	34	26	59	31	23	52	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	66	34	26	57	30	23	49	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	84	84	64	84	78	53	84	65	45	74	55	38	60	47	33	50	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	60	46	33	48	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	91	55	34	76	46	30	64	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	62	36	30	53	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	88	50	37	81	41	32	68	35	27	60	31	24	53	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	52	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	84	70	48	79	58	40	63	48	34	52	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
10	B	0-7	Interior	69	69	69	69	69	64	69	69	53	69	69	45	69	65	39	69	56	34	69	49	31	62	38	26	49	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	69	64	39	69	54	33	69	46	30	64	40	27	55	35	24	48	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	70	70	68	70	70	54	70	63	45	70	52	37	70	44	33	63	37	30	56	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	70	43	33	61	36	29	53	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	77	77	77	77	77	77	77	77	68	77	72	55	77	60	46	77	51	38	77	44	33	66	34	27	54	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	77	60	45	77	49	37	77	41	31	68	35	27	60	32	24	53	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	68	73	73	57	73	72	49	73	62	43	61	47	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	73	73	57	73	69	47	73	58	40	63	49	34	52	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	69	69	43	69	60	36	69	51	32	69	44	29	61	38	26	53	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	61	38	26	51	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	70	49	35	67	40	32	58	34	28	51	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	77	68	52	77	55	42	77	46	35	77	39	30	66	34	26	59	31	23	52	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	66	34	26	57	30	23	49	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	73	73	64	73	73	53	73	65	45	73	55	38	60	47	33	50	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	60	46	33	48	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	69	55	34	69	46	30	64	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	62	36	30	53	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	79	50	37	79	41	32	68	35	27	60	31	24	53	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	52	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	75	70	48	75	58	40	63	48	34	52	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
20	B	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	45	48	48	39	48	48	34	48	48	31	48	38	26	48	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	48	48	39	48	48	33	48	46	30	48	40	27	48	35	24	48	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	49	49	49	49	49	49	49	49	45	49	49	37	49	44	33	49	37	30	49	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	49	43	33	49	36	29	49	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	55	59	59	46	59	51	38	59	44	33	59	34	27	54	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	59	59	45	59	49	37	59	41	31	59	35	27	59	32	24	53	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	49	56	56	43	56	47	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	56	56	56	56	56	47	56	56	40	56	49	34	52	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	48	48	43	48	48	36	48	48	32	48	44	29	48	38	26	48	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	48	38	26	48	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	49	49	35	49	40	32	49	34	28	49	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	59	59	52	59	55	42	59	46	35	59	39	30	59	34	26	59	31	23	52	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	59	34	26	57	30	23	49	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	56	56	56	56	56	53	56	56	45	56	55	38	56	47	33	50	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	56	46	33	48	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	46	30	48	39	27	48	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	36	30	49	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	62	50	37	62	41	32	62	35	27	60	31	24	53	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	52	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	59	59	48	59	58	40	59	48	34	52	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	45	47	47	39	47	47	34	47	47	31	47	38	26	47	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	47	47	39	47	47	33	47	46	30	47	40	27	47	35	24	47	32	22	42	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	49	49	49	49	49	49	49	49	45	49	49	37	49	44	33	49	37	30	49	33	27	45	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	49	43	33	49	36	29	49	32	26	47	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	38	48	44	33	48	34	27	48	29	22	45	25	18	38	22	15	33	19	13	29	17	12
			Exposed	48	48	45	48	48	37	48	41	31	48	35	27	48	32	24	48	29	21	48	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	33	45	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	46	46	46	46	46	46	46	46	40	46	46	34	46	42	30	44	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	47	47	43	47	47	36	47	47	32	47	44	29	47	38	26	47	34	24	46	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	47	38	26	47	33	23	44	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	49	49	35	49	40	32	49	34	28	49	31	25	45	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	45	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	48	48	48	48	48	42	48	46	35	48	39	30	48	34	26	48	31	23	48	28	21	42	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	48	34	26	48	30	23	48	27	20	43	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	46	46	46	46	46	46	46	46	45	46	46	38	46	46	33	46	40	30	43	35	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	46	46	33	46	39	29	40	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	46	30	48	39	27	48	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	47	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	36	30	49	32	26	47	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	51	50	37	51	41	32	51	35	27	51	31	24	51	28	21	47	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	51	28	21	45	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	49	49	48	49	49	40	49	48	34	49	41	30	43	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	43	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
40	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	31	39	38	26	39	32	22	39	28	19	33	24	17	29	21	15	26	19	13
			Exposed	39	39	39	39	39	33	39	39	30	39	39	27	39	35	24	39	32	22	39	29	20	34	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	37	41	41	33	41	37	30	41	33	27	41	28	23	37	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	41	41	33	41	36	29	41	32	26	41	29	24	41	26	21	37	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	33	40	34	27	40	29	22	40	25	18	38	22	15	33	19	13	29	17	12
			Exposed	40	40	40	40	40	37	40	40	31	40	35	27	40	32	24	40	29	21	40	26	19	39	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	37	28	35	31	23	31	27	20	27	24	17	24	21	15
			Exposed	39	39	39	39	39	39	39	39	39	39	39	34	39	39	30	39	36	27	38	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	39	39	39	39	39	36	39	39	32	39	39	29	39	38	26	39	34	24	39	31	22	36	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	39	38	26	39	33	23	39	30	21	38	27	19	33	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	41	41	35	41	40	32	41	34	28	41	31	25	41	28	23	40	25	21	36	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	41	28	23	39	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	40	40	40	40	40	40	40	40	35	40	39	30	40	34	26	40	31	23	40	28	21	40	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	40	34	26	40	30	23	40	27	20	40	24	17	39	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	38	39	39	33	39	39	30	39	36	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	39	39	33	39	39	29	39	34	25	34	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	41	41	34	41	41	30	41	39	27	41	34	24	41	31	22	41	28	20	36	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	41	31	22	39	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	44	36	30	44	32	26	44	29	24	41	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	43	43	37	43	41	32	43	35	27	43	31	24	43	28	21	43	26	19	42	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	43	28	21	43	25	18	40	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	41	41	41	41	41	40	41	41	34	41	41	30	41	35	27	37	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	41	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
50	B	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	31	22	31	28	19	31	24	17	29	21	15	26	19	13
			Exposed	31	31	31	31	31	31	31	31	30	31	31	27	31	31	24	31	31	22	31	29	20	31	24	17	29	21	15	25	18	13	21	16	11	19	14	10	17	12	8
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	30	34	33	27	34	28	23	34	24	20	32	21	17	28	18	15	24	16	13	22	14	12
			Exposed	34	34	33	34	34	29	34	32	26	34	29	24	34	26	21	34	24	19	33	22	18	28	18	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	34	27	35	29	22	35	25	18	35	22	15	33	19	13	29	17	12
			Exposed	35	35	35	35	35	35	35	35	31	35	35	27	35	32	24	35	29	21	35	26	19	35	22	15	33	19	13	28	16	11	24	14	10	21	12	8	19	11	7
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	31	23	31	27	20	27	24	17	24	21	15
			Exposed	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	33	24	31	28	20	26	24	16	23	20	14	20	18	12	18	16	10	16	14	9	14	13	8
	C	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	24	31	31	22	31	26	18	31	22	16	27	19	13	23	17	12	20	15	10	18	13	9
			Exposed	31	31	26	31	31	23	31	30	21	31	27	19	31	24	17	30	22	15	28	20	14	23	17	12	20	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	34	34	34	34	34	32	34	34	28	34	31	25	34	28	23	34	25	21	34	23	19	30	20	16	26	17	14	22	14	12	19	13	10	17	11	9	15	10	8
			Exposed	34	28	23	34	25	20	34	22	18	31	20	16	28	18	15	25	17	14	23	15	12	20	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	30	35	34	26	35	31	23	35	28	21	35	24	17	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8
			Exposed	35	34	26	35	30	23	35	27	20	35	24	17	35	22	15	35	20	14	31	18	12	27	15	10	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	26	33	30	22	28	25	18	25	22	15	21	19	13	19	17	11	17	15	10
			Exposed	33	33	33	33	33	29	33	33	25	33	30	22	31	28	20	28	25	18	26	23	16	22	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	35	35	34	35	35	30	35	35	27	35	34	24	35	31	22	35	28	20	35	26	18	30	22	15	26	19	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	35	31	22	35	28	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	38	36	30	38	32	26	38	29	24	38	26	21	36	23	19	33	21	17	30	19	16	25	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	36	23	19	32	21	17	29	19	15	26	17	14	23	15	12	21	14	11	19	13	10	16	11	9	14	9	6	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	37	37	37	37	37	32	37	35	27	37	31	24	37	28	21	37	26	19	37	24	17	34	20	13	29	17	11	25	15	10	22	13	9	19	11	8	17	10	7
			Exposed	37	28	21	37	25	18	37	23	16	35	20	14	32	18	12	29	17	11	26	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	36	36	36	36	36	36	36	36	34	36	36	30	36	35	27	36	32	24	33	29	21	28	25	17	24	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	36	35	27	35	31	23	32	28	20	28	25	18	26	23	16	23	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	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			
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	18	13	18	16	11	18	14	10	17	12	8
		7-20	Interior	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	17	19	18	15	19	16	13	19	14	12			
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	18	15	19	16	13	19	13	11	18	12	10	16	10	8	14	9	7
		20-27	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	19	13	20	17	12			
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	15	20	19	13	20	16	11	20	14	10	20	12	8	19	11	7
		27-45	Interior	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	19	19	19	17	19	19	15			
			Exposed	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	16	19	19	14	19	18	12	18	16	10	16	14	9
	C	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	18	13	18	17	12	18	15	10	18	13	9
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	18	14	18	17	12	18	14	10	17	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	16	19	17	14	19	14	12	19	13	10	17	11	9	15	10	8
			Exposed	19	19	19	19	19	19	19	19	18	19	19	16	19	18	15	19	17	14	19	15	12	19	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	17	20	20	14	20	17	12	20	15	10	20	13	9	20	12	8
			Exposed	20	20	20	20	20	20	20	20	20	20	20	17	20	20	15	20	20	14	20	18	12	20	15	10	20	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	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	15	19	19	13	19	17	11	17	15	10			
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	19	19	13	19	17	11	16	14	9	14	12	8	12	11	7	11	10	6			
	D	0-7	Interior	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	19	13	20	16	11	19	14	10	17	12	9	15	11	8
			Exposed	20	20	20	20	20	19	20	20	17	20	20	16	20	20	14	20	18	13	20	17	12	19	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	21	17	22	19	16	22	16	13	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	22	22	19	22	21	17	22	19	15	22	17	14	22	15	12	21	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	22	17	22	20	13	22	17	11	22	15	10	22	13	9	19	11	8	17	10	7
			Exposed	22	22	21	22	22	18	22	22	16	22	20	14	22	18	12	22	17	11	22	15	10	22	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	17	21	21	15	21	18	12	18	16	10	16	14	9	14	13	8
			Exposed	21	21	21	21	21	21	21	21	20	21	21	18	21	21	16	21	21	14	21	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5
100	B	0-7	Interior	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
			Exposed	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	11	16	14	10	16	12	8
		7-20	Interior	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	17	17	17	15	17	16	13	17	14	12
			Exposed	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	16	13	17	13	11	17	12	10	16	10	8	14	9	7
		20-27	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15	18	18	13	18	18	13	18	17	12
			Exposed	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	16	11	18	14	10	18	12	8	18	11	7
		27-45	Interior	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	17	17	17	17	17	17	17			
			Exposed	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	16	10	16	14	9	16	10	6
	C	0-7	Interior	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	13	16	16	12	16	15	10	16	13	9
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	14	16	16	12	16	14	10	16	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	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	14	12	17	13	10	17	11	9	15	10	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	17	17	14	17	15	12	17	13	10	17	11	9	14	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	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	14	18	17	12	18	15	10	18	13	9	18	12	8
			Exposed	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	18	14	18	18	12	18	15	10	18	13	9	18	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	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	15	17	17	13	17	17	11	17	15	10			
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	13	17	17	11	16	14	9	14	12	8	12	11	7	11	10	6
	D	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15	18	18	13	18	16	11	18	14	10	17	12	9	15	11	8
			Exposed	18	18	18	18	18	18	18	18	17	18	18	16	18	18	14	18	18	13	18	17	12	18	14	10	17	12	8	14	10	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	16	19	16	13	19	14	12	19	12	10	16	11	9	14	9	8	13	8	7			
			Exposed	19	19	19	19	19	17	19	19	15	19	17	14	19	15	12	19	14	11	19	13	10	16	11	9	14	9	7	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	13	20	17	11	20	15	10	20	13	9	19	11	8	17	10	7			
			Exposed	20	20	20	20	20	18	20	20	16	20	20	14	20	18	12	20	17	11	20	15	10	20	13	9	19	11	7	16	9	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	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	18	12	18	16	10	16	14	9	14	13	8
			Exposed	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	19	19	14	19	19	13	18	16	11	16	14	9	13	12	7	12	10	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	185	185	185	185	185	185	185	185	185	185	185	185	185	185	97	185	185	71	185	143	61	185	86	52	145	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	185	185	95	185	185	66	185	123	59	185	91	53	185	72	48	138	62	44	102	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	65	183	183	59	183	67	54	183	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	183	183	65	183	105	58	183	63	52	183	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	76	173	72	52	173	57	43	108	49	35	79	43	30	65	38	26	58	34	23
			Exposed	173	173	173	173	173	173	173	173	62	173	80	54	173	62	47	173	56	42	145	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	69	164	89	54	164	62	45	60	54	39	53	48	33	47	42	29
			Exposed	164	164	164	164	164	164	164	164	126	164	164	74	164	149	60	164	85	53	164	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	185	185	134	185	185	82	185	161	63	185	111	57	185	85	52	185	69	47	129	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	185	84	51	171	65	46	112	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	183	183	183	183	183	62	183	77	56	183	61	50	183	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	183	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	173	173	173	173	173	173	173	173	173	173	173	59	173	71	52	173	61	46	173	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	173	70	52	173	59	45	173	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	164	164	164	164	164	164	164	164	164	164	164	100	164	164	68	164	119	58	164	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	164	164	67	164	103	56	164	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	185	185	68	185	124	59	185	91	53	185	71	48	132	61	43	98	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	130	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	183	183	58	183	63	52	183	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	173	173	173	173	173	63	173	78	54	173	62	47	173	56	41	126	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	173	55	41	109	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	164	164	164	164	164	128	164	164	73	164	134	59	164	81	53	164	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	164	80	52	164	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
10	B	0-7	Interior	135	135	135	135	135	135	135	135	135	135	135	135	135	135	97	135	135	71	135	135	61	135	86	52	135	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	135	135	95	135	135	66	135	123	59	135	91	53	135	72	48	135	62	44	102	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	65	136	136	59	136	67	54	136	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	136	136	65	136	105	58	136	63	52	136	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	76	150	72	52	150	57	43	108	49	35	79	43	30	65	38	26	58	34	23
			Exposed	150	150	150	150	150	150	150	150	62	150	80	54	150	62	47	150	56	42	145	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	69	142	89	54	142	62	45	60	54	39	53	48	33	47	42	29
			Exposed	142	142	142	142	142	142	142	142	126	142	142	74	142	142	60	142	85	53	142	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	135	135	134	135	135	82	135	135	63	135	111	57	135	85	52	135	69	47	129	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	135	84	51	135	65	46	112	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	136	136	136	136	136	62	136	77	56	136	61	50	136	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	136	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	150	150	150	150	150	150	150	150	150	150	150	59	150	71	52	150	61	46	150	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	150	70	52	150	59	45	150	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	142	142	142	142	142	142	142	142	142	142	142	100	142	142	68	142	119	58	142	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	142	142	67	142	103	56	142	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	135	135	68	135	124	59	135	91	53	135	71	48	132	61	43	98	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	130	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	136	136	58	136	63	52	136	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	155	155	155	155	155	63	155	78	54	155	62	47	155	56	41	126	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	155	55	41	109	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	146	146	146	146	146	128	146	146	73	146	134	59	146	81	53	146	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	146	80	52	146	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
20	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	71	94	94	61	94	86	52	94	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	94	94	94	94	94	66	94	94	59	94	91	53	94	72	48	94	62	44	94	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	65	95	95	59	95	67	54	95	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	95	95	65	95	95	58	95	63	52	95	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	76	116	72	52	116	57	43	108	49	35	79	43	30	65	38	26	58	34	23
			Exposed	116	116	116	116	116	116	116	116	62	116	80	54	116	62	47	116	56	42	116	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	69	111	89	54	111	62	45	60	54	39	53	48	33	47	42	29
			Exposed	111	111	111	111	111	111	111	111	111	111	111	74	111	111	60	111	85	53	111	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	94	94	94	94	94	82	94	94	63	94	94	57	94	85	52	94	69	47	94	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	94	84	51	94	65	46	94	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	95	95	95	95	95	62	95	77	56	95	61	50	95	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	95	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	59	116	71	52	116	61	46	116	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	116	70	52	116	59	45	116	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	111	111	111	111	111	111	111	111	111	111	111	100	111	111	68	111	111	58	111	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	111	111	67	111	103	56	111	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	94	94	68	94	94	59	94	91	53	94	71	48	94	61	43	94	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	94	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	95	95	58	95	63	52	95	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	121	121	121	121	121	63	121	78	54	121	62	47	121	56	41	121	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	121	55	41	109	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	116	116	116	116	116	116	116	116	73	116	116	59	116	81	53	116	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	116	80	52	116	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	71	91	91	61	91	86	52	91	63	44	91	54	38	65	47	33	57	42	29	51	37	26
			Exposed	91	91	91	91	91	66	91	91	59	91	91	53	91	72	48	91	62	44	91	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	65	95	95	59	95	67	54	95	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	95	95	65	95	95	58	95	63	52	95	57	47	87	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	76	94	72	52	94	57	43	94	49	35	79	43	30	65	38	26	58	34	23
			Exposed	94	94	94	94	94	94	94	94	62	94	80	54	94	62	47	94	56	42	94	52	37	80	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	69	90	89	54	90	62	45	60	54	39	53	48	33	47	42	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	74	90	90	60	90	85	53	90	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	91	91	91	91	91	82	91	91	63	91	91	57	91	85	52	91	69	47	91	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	91	84	51	91	65	46	91	58	41	84	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	95	95	95	95	95	62	95	77	56	95	61	50	95	55	45	84	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	95	55	45	81	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	59	94	71	52	94	61	46	94	55	41	90	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	94	70	52	94	59	45	94	53	39	94	48	34	80	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	68	90	90	58	90	79	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	90	90	67	90	90	56	90	69	50	78	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	94	94	68	94	94	59	94	91	53	94	71	48	94	61	43	94	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	94	61	43	91	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	95	95	58	95	63	52	95	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	100	100	100	100	100	63	100	78	54	100	62	47	100	56	41	100	51	37	89	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	100	55	41	100	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	96	96	96	96	96	96	96	96	73	96	96	59	96	81	53	96	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	96	80	52	96	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
40	B	0-7	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	71	76	76	61	76	76	52	76	63	44	76	54	38	65	47	33	57	42	29	51	37	26
			Exposed	76	76	76	76	76	66	76	76	59	76	76	53	76	72	48	76	62	44	76	57	40	67	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	65	80	80	59	80	67	54	80	55	46	77	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	80	80	65	80	80	58	80	63	52	80	57	47	80	51	42	75	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	79	72	52	79	57	43	79	49	35	79	43	30	65	38	26	58	34	23
			Exposed	79	79	79	79	79	79	79	79	62	79	79	54	79	62	47	79	56	42	79	52	37	79	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	69	76	76	54	76	62	45	60	54	39	53	48	33	47	42	29
			Exposed	76	76	76	76	76	76	76	76	76	76	76	74	76	76	60	76	76	53	76	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	76	76	76	76	76	76	76	76	63	76	76	57	76	76	52	76	69	47	76	61	43	76	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	76	76	51	76	65	46	76	58	41	76	53	37	66	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	80	80	80	80	80	62	80	77	56	80	61	50	80	55	45	80	50	41	73	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	80	55	45	80	49	40	69	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	59	79	71	52	79	61	46	79	55	41	79	47	33	70	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	79	70	52	79	59	45	79	53	39	79	48	34	79	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	68	76	76	58	76	76	52	66	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	76	76	67	76	76	56	76	69	50	76	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	81	81	68	81	81	59	81	81	53	81	71	48	81	61	43	81	56	39	77	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	81	61	43	81	54	38	70	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	86	86	58	86	63	52	86	56	46	86	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	85	85	85	85	85	63	85	78	54	85	62	47	85	56	41	85	51	37	85	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	85	55	41	85	49	36	83	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	81	81	81	81	81	81	81	81	73	81	81	59	81	81	53	81	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	81	80	52	81	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
50	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	52	62	62	44	62	54	38	62	47	33	57	42	29	51	37	26			
			Exposed	62	62	62	62	62	62	62	62	59	62	62	53	62	62	48	62	62	44	62	57	40	62	48	34	56	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	65	67	67	59	67	67	54	67	55	46	67	47	39	63	41	34	55	36	29	48	31	26	43	28	23
			Exposed	67	67	65	67	67	58	67	63	52	67	57	47	67	51	42	67	47	38	66	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	52	69	57	43	69	49	35	69	43	30	65	38	26	58	34	23
			Exposed	69	69	69	69	69	69	69	69	62	69	69	54	69	62	47	69	56	42	69	52	37	69	44	30	64	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	54	65	62	45	60	54	39	53	48	33	47	42	29
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	65	53	65	65	48	61	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	57	62	62	52	62	62	47	62	61	43	62	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	62	62	51	62	62	46	62	58	41	62	53	37	62	48	34	60	43	31	55	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	67	67	67	67	67	62	67	67	56	67	61	50	67	55	45	67	50	41	67	46	38	59	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	67	55	45	67	49	40	67	44	36	61	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	59	69	69	52	69	61	46	69	55	41	69	47	33	69	40	27	59	35	24	52	30	21	45	27	18	40	24	16
			Exposed	69	69	52	69	59	45	69	53	39	69	48	34	69	43	30	69	39	27	62	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	58	65	65	52	65	59	43	56	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	65	65	65	65	65	56	65	65	50	65	60	44	61	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	68	68	68	68	68	59	68	68	53	68	68	48	68	61	43	68	56	39	68	51	36	59	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	68	61	43	68	54	38	68	49	34	61	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	74	74	58	74	63	52	74	56	46	74	51	42	74	46	38	65	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	73	46	38	63	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	74	74	74	74	74	63	74	74	54	74	62	47	74	56	41	74	51	37	74	46	33	68	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	74	55	41	74	49	36	74	44	31	71	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	59	71	71	53	71	63	47	65	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	71	71	52	71	62	46	62	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	44	52	52	38	52	47	33	52	42	29	51	37	26
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	44	52	52	40	52	48	34	52	41	29	49	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	54	57	55	46	57	47	39	57	41	34	55	36	29	48	31	26	43	28	23
			Exposed	57	57	57	57	57	57	57	57	52	57	57	47	57	51	42	57	47	38	57	43	35	55	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	57	43	58	49	35	58	43	30	58	38	26	58	34	23
			Exposed	58	58	58	58	58	58	58	58	58	58	58	54	58	58	47	58	56	42	58	52	37	58	44	30	58	37	25	55	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	45	55	54	39	53	48	33	47	42	29
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	48	55	55	39	52	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	52	43	52	51	36	52	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	52	52	51	52	52	46	52	52	41	52	52	37	52	48	34	52	43	31	52	40	28	46	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	57	57	57	57	57	57	57	57	56	57	57	50	57	55	45	57	50	41	57	46	38	57	39	32	51	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	57	55	45	57	49	40	57	44	36	57	40	33	55	36	30	50	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	46	58	55	41	58	47	33	58	40	27	58	35	24	52	30	21	45	27	18	40	24	16
			Exposed	58	58	52	58	58	45	58	53	39	58	48	34	58	43	30	58	39	27	58	36	25	52	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	43	55	50	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	55	55	55	55	55	55	55	55	50	55	55	44	55	54	39	55	49	35	51	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	58	58	58	58	58	58	58	58	53	58	58	48	58	58	43	58	56	39	58	51	36	58	43	30	51	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	58	58	43	58	54	38	58	49	34	58	44	31	55	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	62	62	58	62	62	52	62	56	46	62	51	42	62	46	38	62	42	35	59	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	62	46	38	62	41	34	56	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	64	64	64	64	64	63	64	64	54	64	62	47	64	56	41	64	51	37	64	46	33	64	39	27	57	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	64	55	41	64	49	36	64	44	31	64	40	27	62	36	25	57	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	59	61	61	53	61	61	47	61	58	42	55	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	61	61	52	61	61	46	61	56	40	56	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
70	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	38	45	45	33	45	42	29	45	37	26
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	40	45	45	34	45	41	29	45	35	25	42	31	22	37	27	19	33	24	17
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	47	39	49	41	34	49	36	29	48	31	26	43	28	23	40	28	23
			Exposed	49	49	49	49	49	49	49	49	49	49	49	47	49	49	42	49	47	38	49	43	35	49	36	30	47	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43	50	49	35	50	43	30	50	38	26	50	34	23	40	30	19
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	42	50	50	37	50	44	30	50	37	25	50	32	22	48	28	19	42	25	17	38	22	15
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	45	48	48	39	48	48	33	47	42	29
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	39	48	47	33	45	40	27	39	35	23	35	31	20	31	28	18
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	36	45	44	31	45	38	27	45	33	23	40	29	21	36	26	18
			Exposed	45	45	45	45	45	45	45	45	41	45	45	37	45	45	34	45	43	31	45	40	28	45	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	45	49	49	41	49	46	38	49	39	32	49	33	27	44	29	24	38	25	21	34	22	18	30	20	16
			Exposed	49	49	45	49	49	40	49	44	36	49	40	33	49	36	30	49	33	27	46	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	46	50	50	41	50	47	33	50	40	27	50	35	24	50	30	21	45	27	18	40	24	16
			Exposed	50	50	50	50	50	45	50	50	39	50	48	34	50	43	30	50	39	27	50	36	25	50	31	21	45	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	35	48	43	30	42	38	25	37	33	22	33	30	19
			Exposed	48	48	48	48	48	48	48	48	48	48	48	44	48	48	39	48	48	35	48	45	31	43	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	50	39	50	50	36	50	43	30	50	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	50	50	43	50	50	38	50	49	34	50	44	31	50	40	28	50	36	26	46	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	54	54	54	54	54	52	54	54	46	54	51	42	54	46	38	54	42	35	54	38	32	50	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	54	46	38	54	41	34	54	37	30	51	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	55	55	55	55	55	55	55	55	54	55	55	47	55	55	41	55	51	37	55	46	33	55	39	27	55	34	23	50	29	20	43	25	17	38	22	15	34	20	14
			Exposed	55	55	41	55	49	36	55	44	31	55	40	27	55	36	25	55	33	23	52	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	47	53	53	42	53	49	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	53	53	52	53	53	46	53	53	40	53	50	35	51	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	33	40	40	29	40	37	26
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	29	40	35	25	40	31	22	37	27	19	33	24	17
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	41	34	43	36	29	43	31	26	43	28	23	40	28	23
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	38	43	43	35	43	36	30	43	31	25	41	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	35	44	43	30	44	44	26	44	34	23
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	37	44	44	30	44	37	25	44	32	22	44	28	19	42	25	17	38	22	15
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	33	42	42	29
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	33	42	42	29
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	31	40	38	27	40	33	23	40	29	21	36	26	18
			Exposed	40	40	40	40	40	40	40	40	40	40	40	37	40	40	34	40	40	31	40	40	28	40	33	24	39	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	41	43	43	38	43	39	32	43	33	27	43	29	24	38	25	21	34	22	18	30	20	16
			Exposed	43	43	43	43	43	40	43	43	36	43	40	33	43	36	30	43	33	27	43	30	25	39	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	33	44	40	27	44	35	24	44	30	21	44	27	18	40	24	16
			Exposed	44	44	44	44	44	44	44	44	39	44	44	34	44	43	30	44	39	27	44	36	25	44	31	21	44	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	35	42	42	30	42	38	25	37	33	22	33	30	19
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	35	42	42	31	42	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	39	44	44	36	44	43	30	44	37	26	44	32	22	38	28	20	34	24	17	30	22	15
			Exposed	44	44	43	44	44	38	44	44	34	44	44	31	44	40	28	44	36	26	44	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	48	48	48	48	48	48	48	48	46	48	48	42	48	46	38	48	42	35	48	38	32	48	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	48	46	38	48	41	34	48	37	30	48	33	27	46	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	49	37	49	46	33	49	39	27	49	34	23	49	29	20	43	25	17	38	22	15	34	20	14
			Exposed	49	49	41	49	49	36	49	44	31	49	40	27	49	36	25	49	33	23	49	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	42	47	47	35	47	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	47	47	47	47	47	46	47	47	40	47	47	35	47	46	32	46	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM Slider
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	35	26
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	25	35	31	22	35	27	19	33	24	17
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	29	38	31	26	38	28	23
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	36	30	38	31	25	38	27	22	36	23	19	31	21	17	28	18	15
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	38	26	40	34	23
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	30	40	37	25	40	32	22	40	28	19	40	25	17	38	22	15
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	33	38	38	29
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	27	38	35	23	35	31	20	31	28	18
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	27	35	33	23	35	29	21	35	26	18
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	35	28	35	33	24	35	29	20	34	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	32	38	33	27	38	29	24	38	25	21	34	22	18	30	20	16
			Exposed	38	38	38	38	38	38	38	38	36	38	38	33	38	36	30	38	33	27	38	30	25	38	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	33	40	40	27	40	35	24	40	30	21	40	27	18	40	24	16
			Exposed	40	40	40	40	40	40	40	40	39	40	40	34	40	40	30	40	39	27	40	36	25	40	31	21	40	26	18	39	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	30	38	38	25	37	33	22	33	30	19
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	31	38	38	26	37	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	30	39	37	26	39	32	22	38	28	20	34	24	17	30	22	15
			Exposed	39	39	39	39	39	38	39	39	34	39	39	31	39	39	28	39	36	26	39	33	23	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	38	42	42	35	42	38	32	42	32	27	42	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	42	42	38	42	41	34	42	37	30	42	33	27	42	30	25	42	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	41	44	44	37	44	44	33	44	39	27	44	34	23	44	29	20	43	25	17	38	22	15	34	20	14
			Exposed	44	44	41	44	44	36	44	44	31	44	40	27	44	36	25	44	33	23	44	30	21	44	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	35	42	42	29	41	36	24	36	32	21	31	28	18	28	25	16
			Exposed	42	42	42	42	42	42	42	42	40	42	42	35	42	42	32	42	41	28	42	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10
100	B	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	25	32	31	22	32	27	19	32	24	17
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	31	26	35	28	23						
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	31	25	35	27	22	35	23	19	31	21	17	28	18	15
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	36	26	36	34	23						
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	36	25	36	32	22	36	28	19	36	25	17	36	22	15
		27-45	Interior	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	34	34	34	33	34	34	29			
			Exposed	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	27	34	34	23	34	31	20	31	28	18			
	C	0-7	Interior	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	23	32	29	21	32	26	18			
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	32	24	32	29	20	32	25	18	30	22	15	26	19	13	23	17	12
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	33	27	35	29	24	35	25	21	34	22	18	30	20	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	30	35	33	27	35	30	25	35	25	21	33	22	18	29	19	15	25	16	14	22	14	12	20	13	11
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	27	36	36	25	36	31	21	36	26	18	36	24	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	34	36	36	30	36	36	27	36	36	25	36	31	21	36	26	18	36	23	15	34	20	14	30	17	12	26	15	11
		27-45	Interior	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	30	34	34	25	34	33	22	33	30	19			
			Exposed	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	33	22	32	28	18	28	25	16	24	22	13	22	19	12
	D	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	35	26	35	32	22	35	28	20	34	24	17	30	22	15			
			Exposed	35	35	35	35	35	35	35	35	34	35	35	31	35	35	28	35	35	26	35	33	23	35	28	20	33	24	17	29	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	32	27	38	28	23	37	24	20	32	21	17	28	18	15	25	16	14
			Exposed	38	38	38	38	38	34	38	37	30	38	33	27	38	30	25	38	27	23	38	25	21	32	21	18	28	18	15	24	16	13	21	14	11	18	12	10	16	11	9
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	39	27	40	34	23	40	29	20	40	25	17	38	22	15	34	20	14
			Exposed	40	40	40	40	40	36	40	40	31	40	40	27	40	36	25	40	33	23	40	30	21	40	26	18	37	22	15	32	19	13	28	17	11	25	15	10	22	13	9
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	29	38	36	24	36	32	21	31	28	18	28	25	16
			Exposed	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	28	38	38	26	36	32	21	31	28	18	27	24	15	23	21	13	21	18	11	18	16	10

Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

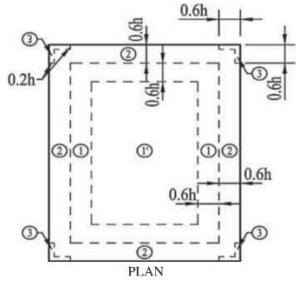
Seismic Design Assumptions

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

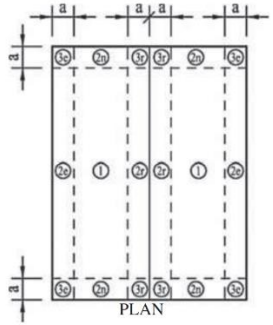
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

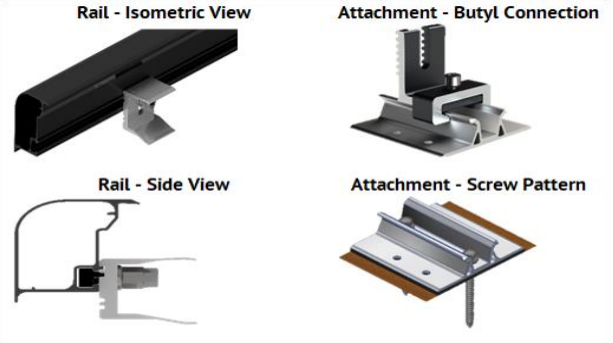
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Trim Rail - DtD Rafter

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	113	113	94	113	113	77	113	113	65	113	91	55	113	78	47	113	68	42	98	60	38	75	47	32	59	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	113	78	47	113	66	40	91	56	36	78	48	33	67	42	30	58	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	112	112	83	112	96	66	112	77	55	112	64	46	89	53	40	77	46	36	68	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	87	53	40	74	44	36	65	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	110	110	110	110	110	110	110	110	83	110	88	67	110	73	56	110	62	47	110	53	41	80	41	32	66	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	110	73	55	110	60	45	98	50	38	83	42	33	73	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	107	107	107	107	107	107	107	107	99	107	107	83	107	107	70	107	87	60	107	75	52	74	57	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	107	107	69	107	84	58	96	70	49	77	59	42	64	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	113	87	52	113	73	44	105	62	39	87	53	35	74	46	32	65	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	74	46	32	62	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	112	60	43	81	49	38	71	42	34	62	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	110	83	63	110	68	51	110	56	42	93	47	37	80	41	32	71	37	28	63	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	80	41	32	69	36	28	60	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	107	107	78	107	95	65	107	79	54	90	66	46	73	57	40	61	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	73	56	40	59	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	113	66	41	92	56	36	77	48	33	66	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	75	44	36	65	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	110	60	46	99	50	38	83	42	33	72	38	29	64	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	63	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	107	85	58	97	70	49	77	59	42	63	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
10	B	0-7	Interior	83	83	83	83	83	77	83	83	65	83	83	55	83	78	47	83	68	42	83	60	38	75	47	32	59	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	83	78	47	83	66	40	83	56	36	78	48	33	67	42	30	58	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	83	83	83	83	83	66	83	77	55	83	64	46	83	53	40	77	46	36	68	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	83	53	40	74	44	36	65	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	109	109	109	109	109	109	109	109	83	109	88	67	109	73	56	109	62	47	109	53	41	80	41	32	66	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	109	73	55	109	60	45	98	50	38	83	42	33	73	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	107	107	107	107	107	107	107	107	99	107	107	83	107	107	70	107	87	60	107	75	52	74	57	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	107	107	69	107	84	58	96	70	49	77	59	42	64	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	83	83	52	83	73	44	83	62	39	83	53	35	74	46	32	65	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	74	46	32	62	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	83	60	43	81	49	38	71	42	34	62	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	109	83	63	109	68	51	109	56	42	93	47	37	80	41	32	71	37	28	63	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	80	41	32	69	36	28	60	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	107	107	78	107	95	65	107	79	54	90	66	46	73	57	40	61	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	73	56	40	59	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	83	66	41	83	56	36	77	48	33	66	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	75	44	36	65	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	110	60	46	99	50	38	83	42	33	72	38	29	64	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	63	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	107	85	58	97	70	49	77	59	42	63	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
20	B	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	55	57	57	47	57	57	42	57	57	38	57	47	32	57	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	57	57	47	57	57	40	57	56	36	57	48	33	57	42	30	57	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	55	58	58	46	58	53	40	58	46	36	58	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	58	53	40	58	44	36	58	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	86	86	86	86	86	86	86	86	83	86	86	67	86	73	56	86	62	47	86	53	41	80	41	32	66	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	86	73	55	86	60	45	86	50	38	83	42	33	73	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	83	84	84	70	84	84	60	84	75	52	74	57	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	84	84	69	84	84	58	84	70	49	77	59	42	64	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	57	57	52	57	57	44	57	57	39	57	53	35	57	46	32	57	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	57	46	32	57	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	58	58	43	58	49	38	58	42	34	58	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	86	83	63	86	68	51	86	56	42	86	47	37	80	41	32	71	37	28	63	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	80	41	32	69	36	28	60	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	84	84	78	84	84	65	84	79	54	84	66	46	73	57	40	61	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	73	56	40	59	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	41	57	56	36	57	48	33	57	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	58	44	36	58	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	90	60	46	90	50	38	83	42	33	72	38	29	64	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	63	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	90	85	58	90	70	49	77	59	42	63	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	55	56	56	47	56	56	42	56	56	38	56	47	32	56	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	56	56	47	56	56	40	56	56	36	56	48	33	56	42	30	56	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	55	58	58	46	58	53	40	58	46	36	58	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	58	53	40	58	44	36	58	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	56	66	62	47	66	53	41	66	41	32	66	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	66	66	55	66	60	45	66	50	38	66	42	33	66	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	61	52	61	57	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	61	61	61	61	61	58	61	61	49	61	59	42	61	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	56	56	52	56	56	44	56	56	39	56	53	35	56	46	32	56	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	56	46	32	56	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	58	58	43	58	49	38	58	42	34	58	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	66	66	63	66	66	51	66	56	42	66	47	37	66	41	32	66	37	28	63	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	66	41	32	66	36	28	60	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	61	61	61	61	61	61	61	61	54	61	61	46	61	57	40	61	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	61	56	40	59	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	41	57	56	36	57	48	33	57	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	58	44	36	58	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	72	60	46	72	50	38	72	42	33	72	38	29	64	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	63	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	67	67	58	67	67	49	67	59	42	63	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
40	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	38	46	46	32	46	39	27	46	33	24	40	29	20	35	26	18	31	23	16
			Exposed	46	46	46	46	46	40	46	46	36	46	46	33	46	42	30	46	38	27	46	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	46	49	49	40	49	46	36	49	40	33	49	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	49	49	40	49	44	36	49	39	32	49	35	29	49	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	41	51	41	32	51	35	26	51	30	22	46	27	18	40	23	16	36	21	14
			Exposed	51	51	51	51	51	45	51	50	38	51	42	33	51	38	29	51	35	26	51	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	41	48	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	48	48	48	48	48	48	48	48	48	48	48	42	48	48	37	48	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	46	46	46	46	46	44	46	46	39	46	46	35	46	46	32	46	41	29	46	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	46	46	32	46	40	28	46	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	49	49	43	49	49	38	49	42	34	49	38	31	49	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	49	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	51	51	51	51	51	51	51	51	42	51	47	37	51	41	32	51	37	28	51	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	51	41	32	51	36	28	51	33	24	51	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	48	36	48	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	48	48	40	48	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	50	50	41	50	50	36	50	48	33	50	42	29	50	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	50	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	53	44	36	53	39	32	53	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	56	56	46	56	50	38	56	42	33	56	38	29	56	34	26	56	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	56	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	53	53	53	53	53	49	53	53	42	53	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
50	B	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	27	38	33	24	38	29	20	35	26	18	31	23	16			
			Exposed	38	38	38	38	38	38	38	38	36	38	38	33	38	38	30	38	38	27	38	35	25	38	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	40	41	41	36	41	40	33	41	34	28	41	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	41	41	40	41	41	36	41	39	32	41	35	29	41	32	26	41	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	41	32	42	35	26	42	30	22	42	27	18	40	23	16	36	21	14
			Exposed	42	42	42	42	42	42	42	42	38	42	42	33	42	38	29	42	35	26	42	32	23	42	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	33	40	38	28	37	33	24	33	29	20	29	26	18
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	29	38	38	26	38	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	38	38	32	38	38	28	38	36	25	38	32	23	38	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	41	41	41	41	41	38	41	41	34	41	38	31	41	34	28	41	31	25	41	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	41	34	28	41	30	25	41	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	42	42	42	42	42	42	42	42	42	42	42	37	42	41	32	42	37	28	42	34	25	42	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	42	41	32	42	36	28	42	33	24	42	29	21	42	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	40	40	40	40	40	35	40	40	31	40	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	42	42	41	42	42	36	42	42	33	42	42	29	42	38	27	42	34	24	42	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	42	38	26	42	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	45	44	36	45	39	32	45	35	29	45	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	46	46	46	46	46	38	46	42	33	46	38	29	46	34	26	46	31	23	46	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	46	34	25	46	30	22	46	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	43	43	43	43	43	43	43	43	42	43	43	37	43	43	32	43	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	43	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	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	27	32	32	24	32	29	20	32	26	18	31	23	16
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	27	32	32	25	32	29	21	32	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	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	29	24	34	25	21	34	22	18	30	19	16	26	17	14
			Exposed	34	34	34	34	34	34	34	34	32	34	34	29	34	32	26	34	29	24	34	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	30	22	35	27	18	35	23	16	35	21	14			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	35	26	35	32	23	35	27	19	35	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	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	28	34	33	24	33	29	20	29	26	18
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	30	34	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26	32	32	22	32	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	32	32	32	32	32	28	32	32	25	32	32	23	32	29	21	32	27	19	32	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	31	25	34	28	23	34	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	34	34	28	34	30	25	34	27	22	34	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	28	35	34	25	35	29	20	35	25	17	35	21	14	32	19	13	28	16	11	25	14	10
			Exposed	35	35	32	35	35	28	35	33	24	35	29	21	35	27	19	35	24	17	35	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	34	34	34	34	34	34	34	34	31	34	34	27	34	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	35	35	35	35	35	35	35	35	33	35	35	29	35	35	27	35	34	24	35	31	22	35	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	35	35	26	35	33	24	35	30	21	35	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	38	38	36	38	38	32	38	35	29	38	31	26	38	28	23	38	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	38	28	23	38	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	39	39	39	39	39	38	39	39	33	39	38	29	39	34	26	39	31	23	39	29	20	39	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	39	34	25	39	30	22	39	27	19	39	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	32	37	37	29	37	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	37	37	32	37	37	28	37	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
70	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	20	27	26	18	27	23	16
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	21	27	25	18	27	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	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	29	24	30	25	21	30	22	18	30	19	16	26	17	14
			Exposed	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	29	24	30	26	22	30	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	30	22	31	27	18	31	23	16	31	21	14			
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	23	31	27	19	31	23	16	31	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	24	29	29	20	29	26	18
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	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	19	27	23	16	27	20	14	25	18	13	22	16	11
			Exposed	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	27	19	27	24	17	27	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	28	23	30	24	20	30	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	30	30	28	30	30	25	30	27	22	30	24	20	30	22	18	30	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	29	20	31	25	17	31	21	14	31	19	13	28	16	11	25	14	10
			Exposed	31	31	31	31	31	28	31	31	24	31	29	21	31	27	19	31	24	17	31	22	15	31	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	22	29	29	20	29	29	18	29	26	18
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	27	30	30	24	30	30	22	30	26	19	30	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	30	30	26	30	30	24	30	30	21	30	27	19	30	24	17	30	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	33	33	33	33	33	32	33	33	29	33	31	26	33	28	23	33	26	21	33	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	33	28	23	33	25	21	33	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	34	34	34	34	34	34	34	34	33	34	34	29	34	34	26	34	31	23	34	29	20	34	24	16	34	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	34	34	25	34	30	22	34	27	19	34	25	17	34	22	15	34	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26	32	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	32	32	32	32	32	28	32	32	25	32	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
80	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	18	24	23	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	22	15	24	19	13	23	17	12	20	15	10
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	18	26	21	16	26	22	18	26	19	16	26	17	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	22	18	26	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	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	18	27	23	16	27	23	14			
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	19	27	23	16	27	20	13	27	17	12	26	15	10	23	13	9
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	26	18
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	20	26	25	17	24	22	14	21	19	12	19	17	11			
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	13	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	24	20	26	20	17	26	18	14	24	15	13	21	13	11	18	12	10
			Exposed	26	26	26	26	26	25	26	26	22	26	24	20	26	22	18	26	20	17	26	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	20	27	25	17	27	21	14	27	19	13	27	16	11	24	14	9	21	12	8
			Exposed	27	27	27	27	27	27	27	27	24	27	27	21	27	27	19	27	24	17	27	22	15	27	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	22	26	26	18	26	23	16	23	21	13	20	18	12			
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	21	26	26	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	22	27	26	19	27	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	27	27	26	27	27	24	27	27	21	27	27	19	27	24	17	27	22	16	27	24	17	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	26	29	28	23	29	26	21	29	24	19	29	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	29	28	23	29	25	21	29	23	19	29	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	30	23	30	29	20	30	24	16	30	21	14	30	18	12	27	16	11	23	14	9	21	12	8
			Exposed	30	30	25	30	30	22	30	27	19	30	25	17	30	22	15	30	20	14	30	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	21	28	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	28	28	28	28	28	28	28	28	25	28	28	22	28	28	19	28	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	64	94	93	54	94	65	46	94	56	40	71	49	35	59	43	30	53	38	27
			Exposed	94	94	94	94	94	73	94	94	61	94	94	55	94	78	50	94	64	45	94	59	41	72	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	77	97	97	61	97	79	56	97	57	47	81	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	97	97	75	97	97	60	97	65	54	97	59	48	92	53	44	79	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	84	54	110	59	44	110	51	37	83	45	31	68	39	27	60	35	24
			Exposed	110	110	110	110	110	110	110	110	70	110	95	56	110	64	49	110	58	44	110	53	39	84	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	77	103	102	56	103	64	47	62	56	40	55	49	35	49	44	30
			Exposed	103	103	103	103	103	103	103	103	103	103	103	84	103	103	63	103	96	55	103	70	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	94	94	94	94	94	91	94	94	66	94	94	59	94	92	53	94	74	49	94	63	44	86	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	94	91	53	94	70	47	94	60	43	91	54	38	72	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	97	97	97	97	97	64	97	96	58	97	63	52	97	57	47	89	52	43	77	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	97	57	47	85	51	42	72	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	110	110	110	110	110	110	110	110	110	110	110	63	110	82	54	110	63	48	110	57	43	97	48	34	74	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	110	80	54	110	61	46	110	55	40	107	50	35	84	45	31	73	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	76	103	103	61	103	89	54	87	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	103	103	75	103	103	59	103	77	51	103	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	96	96	75	96	96	61	96	96	55	96	76	49	96	63	45	96	58	41	84	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	96	63	44	96	56	40	76	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	97	97	60	97	65	54	97	58	48	91	53	43	78	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	77	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	120	120	120	120	120	71	120	93	56	120	64	49	120	58	43	120	53	38	94	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	120	57	43	120	51	37	87	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	112	112	112	112	112	112	112	112	83	112	112	62	112	91	55	112	67	49	79	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	112	90	54	112	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
40	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	64	77	77	54	77	65	46	77	56	40	71	49	35	59	43	30	53	38	27
			Exposed	77	77	77	77	77	73	77	77	61	77	77	55	77	77	50	77	64	45	77	59	41	72	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	82	61	82	79	56	82	57	47	81	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	82	82	75	82	82	60	82	65	54	82	59	48	82	53	44	79	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	84	54	86	59	44	86	51	37	83	45	31	68	39	27	60	35	24
			Exposed	86	86	86	86	86	86	86	86	70	86	86	56	86	64	49	86	58	44	86	53	39	84	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	77	81	81	56	81	64	47	62	56	40	55	49	35	49	44	30
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	63	81	81	55	81	70	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	77	77	77	77	77	77	77	77	66	77	77	59	77	77	53	77	74	49	77	63	44	77	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	77	77	53	77	70	47	77	60	43	77	54	38	72	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	82	82	82	82	82	64	82	82	58	82	63	52	82	57	47	82	52	43	77	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	82	57	47	82	51	42	72	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	63	86	82	54	86	63	48	86	57	43	86	48	34	74	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	86	80	54	86	61	46	86	55	40	86	50	35	84	45	31	73	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	76	81	81	61	81	81	54	81	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	81	81	75	81	81	59	81	77	51	81	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	83	83	75	83	83	61	83	83	55	83	76	49	83	63	45	83	58	41	83	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	83	63	44	83	56	40	76	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	88	88	60	88	65	54	88	58	48	88	53	43	78	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	77	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	94	94	94	94	94	71	94	93	56	94	64	49	94	58	43	94	53	38	94	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	94	57	43	94	51	37	87	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	88	88	88	88	88	88	88	88	83	88	88	62	88	88	55	88	67	49	79	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	88	88	54	88	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
50	B	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	54	63	63	46	63	56	40	63	49	35	59	43	30	53	38	27
			Exposed	63	63	63	63	63	63	63	63	61	63	63	55	63	63	50	63	63	45	63	59	41	63	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	61	69	69	56	69	57	47	69	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	69	69	69	69	69	60	69	65	54	69	59	48	69	53	44	69	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	54	70	59	44	70	51	37	70	45	31	68	39	27	60	35	24
			Exposed	70	70	70	70	70	70	70	70	70	70	70	56	70	64	49	70	58	44	70	53	39	70	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	56	66	64	47	62	56	40	55	49	35	49	44	30
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	63	66	66	55	66	66	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	59	63	63	53	63	63	49	63	63	44	63	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	63	63	53	63	63	47	63	60	43	63	54	38	63	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	69	69	69	69	69	64	69	69	58	69	63	52	69	57	47	69	52	43	69	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	69	57	47	69	51	42	69	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	63	70	70	54	70	63	48	70	57	43	70	48	34	70	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	70	70	54	70	61	46	70	55	40	70	50	35	70	45	31	70	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	66	54	66	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	66	66	66	66	66	59	66	66	51	66	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	70	70	70	70	70	61	70	70	55	70	70	49	70	63	45	70	58	41	70	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	70	63	44	70	56	40	70	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	76	76	60	76	65	54	76	58	48	76	53	43	76	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	76	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	77	77	77	77	77	71	77	77	56	77	64	49	77	58	43	77	53	38	77	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	77	57	43	77	51	37	77	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	62	73	73	55	73	67	49	73	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	73	73	54	73	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	53	40	53	53	49	35	53	43	30	53	38	27
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	45	53	53	41	53	50	35	53	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	57	47	58	49	40	58	42	35	57	37	31	50	33	27	44	29	24
			Exposed	58	58	58	58	58	58	58	58	54	58	58	48	58	53	44	58	48	40	58	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	51	37	59	45	31	59	39	27	59	35	24			
			Exposed	59	59	59	59	59	59	59	59	59	59	59	56	59	59	49	59	58	44	59	53	39	59	45	31	59	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	47	56	56	40	55	49	35	49	44	30
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	50	56	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	53	44	53	53	38	53	45	32	53	39	28	47	34	24	42	30	21	37	27	19
			Exposed	53	53	53	53	53	47	53	53	43	53	53	38	53	49	35	53	45	32	53	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	52	58	57	47	58	52	43	58	47	39	58	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	58	57	47	58	51	42	58	45	37	58	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	48	59	57	43	59	48	34	59	41	28	59	36	24	54	31	21	47	28	19	42	24	17
			Exposed	59	59	54	59	59	46	59	55	40	59	50	35	59	45	31	59	41	28	59	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	44	56	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	56	56	56	56	56	56	56	56	51	56	56	45	56	56	40	56	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	59	59	59	59	59	59	59	59	55	59	59	49	59	59	45	59	58	41	59	53	37	59	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	59	59	44	59	56	40	59	50	36	59	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	64	64	60	64	64	54	64	58	48	64	53	43	64	48	39	64	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	64	48	39	64	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	65	65	65	65	65	65	65	65	56	65	64	49	65	58	43	65	53	38	65	48	34	65	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	65	57	43	65	51	37	65	46	32	65	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	55	62	62	49	62	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	62	62	54	62	62	47	62	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
70	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	43	30	46	38	27						
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	41	46	46	35	46	42	30	46	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	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	49	40	50	42	35	50	37	31	50	33	27	44	29	24
			Exposed	50	50	50	50	50	50	50	50	50	50	50	48	50	50	44	50	48	40	50	44	36	50	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	37	51	45	31	51	39	27	51	35	24			
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	44	51	51	39	51	45	31	51	39	26	51	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	40	49	49	35	49	44	30
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	41	49	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	38	46	45	32	46	39	28	46	34	24	42	30	21	37	27	19
			Exposed	46	46	46	46	46	46	46	46	43	46	46	38	46	46	35	46	45	32	46	41	29	46	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	43	50	47	39	50	40	33	50	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	50	50	47	50	50	42	50	45	37	50	41	34	50	37	31	50	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	48	51	51	43	51	48	34	51	41	28	51	36	24	51	31	21	47	28	19	42	24	17
			Exposed	51	51	51	51	51	46	51	51	40	51	50	35	51	45	31	51	41	28	51	37	26	51	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	37	49	45	31	44	39	26	39	35	23	34	31	20
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	41	49	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	49	51	51	45	51	51	41	51	51	37	51	44	31	51	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	51	51	44	51	51	40	51	50	36	51	46	32	51	41	29	51	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	55	55	55	55	55	54	55	55	48	55	53	43	55	48	39	55	43	36	55	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	55	48	39	55	42	35	55	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	57	57	57	57	57	57	57	57	56	57	57	49	57	57	43	57	53	38	57	48	34	57	41	28	57	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	57	57	43	57	51	37	57	46	32	57	42	28	57	38	26	57	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	54	44	54	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	54	54	54	54	54	47	54	54	42	54	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	30	40	38	27
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	37	26	40	32	23	39	28	20	34	25	18
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	42	35	44	37	31	44	33	27	44	29	24			
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	36	44	37	31	44	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	37	45	45	31	45	39	27	45	35	24			
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	39	45	45	31	45	39	26	45	33	23	45	29	20	44	26	18	39	23	16
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	43	30
			Exposed	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	34	43	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	30	40	38	27
			Exposed	40	40	40	40	40	40	40	40	40	40	40	38	40	40	35	40	40	32	40	40	29	40	35	25	40	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	39	44	40	33	44	34	28	44	30	25	40	26	21	35	23	19	31	20	17
			Exposed	44	44	44	44	44	42	44	44	37	44	41	34	44	37	31	44	34	28	44	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	34	45	41	28	45	36	24	45	31	21	45	28	19	42	24	17
			Exposed	45	45	45	45	45	45	45	45	40	45	45	35	45	45	31	45	41	28	45	37	26	45	32	22	45	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	31	43	39	26	39	35	23	34	31	20			
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	43	33	43	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	41	45	45	37	45	44	31	45	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	45	45	44	45	45	40	45	45	36	45	45	32	45	41	29	45	38	27	45	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	48	49	49	43	49	48	39	49	43	36	49	40	33	49	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	49	48	39	49	42	35	49	38	31	49	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	49	50	50	43	50	50	38	50	48	34	50	41	28	50	35	24	50	30	21	45	26	18	39	23	16	35	21	14
			Exposed	50	50	43	50	50	37	50	46	32	50	42	28	50	38	26	50	34	23	50	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	44	48	48	36	48	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	48	48	48	48	48	47	48	48	42	48	48	37	48	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	36	36	36	36	36	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	27			
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	30	36	36	26	36	32	23	36	28	20	34	25	18
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	37	31	39	33	27	39	29	24			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	37	31	39	32	26	39	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	37	41	41	31	41	39	27	41	35	24			
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	41	41	31	41	39	26	41	33	23	41	29	20	41	26	18	39	23	16
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	30			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	29	39	37	24	36	32	21	32	29	18			
	C	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	36	28	36	34	24	36	30	21	36	27	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	32	36	36	29	36	35	25	36	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	34	28	39	30	25	39	26	21	35	23	19	31	20	17
			Exposed	39	39	39	39	39	39	39	39	37	39	39	34	39	37	31	39	34	28	39	31	26	39	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	34	41	41	28	41	36	24	41	31	21	41	28	19	41	24	17
			Exposed	41	41	41	41	41	41	41	41	40	41	41	35	41	41	31	41	41	28	41	37	26	41	32	22	41	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	31	39	39	26	39	35	23	34	31	20			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	33	39	39	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12			
	D	0-7	Interior	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	38	27	40	33	23	39	29	20	35	25	18	31	22	16
			Exposed	40	40	40	40	40	40	40	40	36	40	40	32	40	40	29	40	38	27	40	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	40	33	43	34	28	43	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	43	43	39	43	42	35	43	38	31	43	34	28	43	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	38	45	45	34	45	41	28	45	35	24	45	30	21	45	26	18	39	23	16	35	21	14
			Exposed	45	45	43	45	45	37	45	45	32	45	42	28	45	38	26	45	34	23	45	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	43	43	43	43	43	43	43	43	42	43	43	37	43	43	33	43	43	29	43	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
100	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27			
			Exposed	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	32	23	33	28	20	33	25	18
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	33	27	35	29	24			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	32	26	35	28	23	35	24	20	33	21	18	29	19	16
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	31	37	37	27	37	35	24			
			Exposed	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	31	37	37	26	37	33	23	37	29	20	37	26	18	37	23	16
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	24	35	32	21	32	29	18			
	C	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	28	33	33	24	33	30	21	33	27	19
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	25	33	30	21	33	26	18	31	22	16	27	20	14	24	18	12			
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	34	28	35	30	25	35	26	21	35	23	19	31	20	17
			Exposed	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	34	28	35	31	26	35	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	28	37	36	24	37	31	21	37	28	19	37	24	17
			Exposed	37	37	37	37	37	37	37	37	37	37	37	35	37	37	31	37	37	28	37	37	26	37	32	22	37	27	19	37	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	26	35	35	23	34	31	20
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	27	35	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	27	36	33	23	36	29	20	35	25	18	31	22	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	32	36	36	29	36	36	27	36	34	24	36	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	33	39	34	28	39	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	39	39	39	39	39	35	39	38	31	39	34	28	39	31	26	39	28	23	39	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	38	41	41	34	41	41	28	41	35	24	41	30	21	41	26	18	39	23	16	35	21	14
			Exposed	41	41	41	41	41	37	41	41	32	41	41	28	41	38	26	41	34	23	41	31	21	41	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	30	39	38	25	37	33	22	32	29	19	29	26	16
			Exposed	39	39	39	39	39	39	39	39	39	39	39	37	39	39	33	39	39	29	39	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	94	94	79	94	94	65	94	91	54	94	77	46	94	66	40	94	57	35	82	50	32	63	39	27	50	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	94	65	39	92	55	34	77	47	30	65	40	27	56	35	25	49	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	94	94	70	94	80	56	94	65	46	94	53	38	75	45	34	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	73	44	33	62	37	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	93	93	93	93	93	90	93	91	70	93	74	56	93	62	47	93	52	39	89	45	34	67	35	27	55	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	93	61	46	93	50	38	82	42	32	69	35	28	61	32	24	54	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	89	89	89	89	89	89	89	89	83	89	89	69	89	86	59	89	73	50	89	63	43	62	48	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	89	86	58	89	70	48	81	59	41	65	50	35	54	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	94	73	44	94	61	37	86	52	33	73	45	29	62	39	27	54	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	62	39	26	52	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	94	50	36	68	41	32	59	35	29	52	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	93	70	53	93	57	43	93	47	35	78	40	31	67	34	27	59	31	24	53	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	67	34	27	58	30	23	50	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	89	89	66	89	79	54	89	66	45	75	56	39	61	48	34	51	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	61	47	34	49	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	93	56	34	77	47	30	65	40	27	55	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	63	37	30	54	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	93	51	38	83	42	32	69	35	28	60	32	24	53	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	53	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	89	71	49	81	59	41	64	49	35	53	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
10	B	0-7	Interior	69	69	69	69	69	65	69	69	54	69	69	46	69	66	40	69	57	35	69	50	32	63	39	27	50	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	69	65	39	69	55	34	69	47	30	65	40	27	56	35	25	49	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	70	70	70	70	70	56	70	65	46	70	53	38	70	45	34	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	70	44	33	62	37	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	91	91	91	91	91	90	91	91	70	91	74	56	91	62	47	91	52	39	89	45	34	67	35	27	55	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	91	61	46	91	50	38	82	42	32	69	35	28	61	32	24	54	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	89	89	89	89	89	89	89	89	83	89	89	69	89	86	59	89	73	50	89	63	43	62	48	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	89	86	58	89	70	48	81	59	41	65	50	35	54	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	69	69	44	69	61	37	69	52	33	69	45	29	62	39	27	54	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	62	39	26	52	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	70	50	36	68	41	32	59	35	29	52	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	91	70	53	91	57	43	91	47	35	78	40	31	67	34	27	59	31	24	53	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	67	34	27	58	30	23	50	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	89	89	66	89	79	54	89	66	45	75	56	39	61	48	34	51	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	61	47	34	49	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	69	56	34	69	47	30	65	40	27	55	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	63	37	30	54	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	93	51	38	83	42	32	69	35	28	60	32	24	53	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	53	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	89	71	49	81	59	41	64	49	35	53	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
20	B	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	48	35	48	48	32	48	39	27	48	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	48	48	39	48	48	34	48	47	30	48	40	27	48	35	25	48	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	49	49	49	49	49	49	49	49	46	49	49	38	49	45	34	49	38	30	49	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	49	44	33	49	37	30	49	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	72	72	72	72	72	72	72	72	70	72	72	56	72	62	47	72	52	39	72	45	34	67	35	27	55	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	72	61	46	72	50	38	72	42	32	69	35	28	61	32	24	54	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	69	70	70	59	70	70	50	70	63	43	62	48	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	70	70	58	70	70	48	70	59	41	65	50	35	54	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	48	48	44	48	48	37	48	48	33	48	45	29	48	39	27	48	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	48	39	26	48	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	49	49	36	49	41	32	49	35	29	49	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	72	70	53	72	57	43	72	47	35	72	40	31	67	34	27	59	31	24	53	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	67	34	27	58	30	23	50	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	70	70	66	70	70	54	70	66	45	70	56	39	61	48	34	51	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	61	47	34	49	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	47	30	48	40	27	48	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	37	30	49	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	75	51	38	75	42	32	69	35	28	60	32	24	53	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	53	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	75	71	49	75	59	41	64	49	35	53	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	46	47	47	40	47	47	35	47	47	32	47	39	27	47	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	47	47	39	47	47	34	47	47	30	47	40	27	47	35	25	47	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	49	49	49	49	49	49	49	49	46	49	49	38	49	45	34	49	38	30	49	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	49	44	33	49	37	30	49	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	47	55	52	39	55	45	34	55	35	27	55	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	55	55	46	55	50	38	55	42	32	55	35	28	55	32	24	54	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	43	51	48	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	51	51	51	51	51	48	51	51	41	51	50	35	51	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	47	47	44	47	47	37	47	47	33	47	45	29	47	39	27	47	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	47	39	26	47	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	49	49	36	49	41	32	49	35	29	49	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	55	55	53	55	55	43	55	47	35	55	40	31	55	34	27	55	31	24	53	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	55	34	27	55	30	23	50	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	51	51	51	51	51	51	51	51	45	51	51	39	51	48	34	51	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	51	47	34	49	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	47	30	48	40	27	48	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	37	30	49	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	60	51	38	60	42	32	60	35	28	60	32	24	53	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	53	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	56	56	49	56	56	41	56	49	35	53	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
40	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	39	27	39	32	23	39	28	20	34	24	17	30	21	15	26	19	13
			Exposed	39	39	39	39	39	34	39	39	30	39	39	27	39	35	25	39	32	22	39	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	38	41	41	34	41	38	30	41	34	28	41	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	41	41	33	41	37	30	41	32	27	41	29	24	41	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	34	43	35	27	43	29	22	43	25	18	39	22	15	34	19	13	30	17	12
			Exposed	43	43	43	43	43	38	43	42	32	43	35	28	43	32	24	43	29	22	43	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	40	40	40	40	40	40	40	40	40	40	40	35	40	40	31	40	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	39	39	39	39	39	37	39	39	33	39	39	29	39	39	27	39	34	24	39	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	39	39	26	39	34	24	39	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	41	41	36	41	41	32	41	35	29	41	31	26	41	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	41	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	43	43	43	43	43	43	43	43	35	43	40	31	43	34	27	43	31	24	43	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	43	34	27	43	30	23	43	27	20	43	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	39	40	40	30	40	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10			
			Exposed	40	40	34	40	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	41	41	34	41	41	30	41	40	27	41	35	24	41	32	22	41	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	41	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	44	37	30	44	32	27	44	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	47	47	38	47	42	32	47	35	28	47	32	24	47	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	47	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	44	44	44	44	44	41	44	44	35	44	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
50	B	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	27	31	31	23	31	28	20	31	24	17	30	21	15	26	19	13			
			Exposed	31	31	31	31	31	31	31	31	30	31	31	27	31	31	25	31	31	22	31	29	20	31	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	30	34	34	28	34	28	23	34	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	34	34	33	34	34	30	34	32	27	34	29	24	34	26	22	34	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	27	35	29	22	35	25	18	35	22	15	34	19	13	30	17	12
			Exposed	35	35	35	35	35	35	35	35	32	35	35	28	35	32	24	35	29	22	35	27	19	35	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	32	23	31	28	20	27	24	17	24	22	15
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	28	33	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	29	31	31	27	31	31	24	31	31	22	31	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	31	31	26	31	31	24	31	30	21	31	27	19	31	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	34	34	34	34	34	32	34	34	29	34	31	26	34	28	23	34	26	21	34	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	34	28	23	34	25	21	34	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	31	35	34	27	35	31	24	35	29	21	35	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	35	34	27	35	30	23	35	27	20	35	25	18	35	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	33	33	33	33	33	29	33	33	26	33	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	35	35	34	35	35	30	35	35	27	35	35	24	35	32	22	35	29	20	35	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	35	31	22	35	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	38	37	30	38	32	27	38	29	24	38	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	38	38	38	38	38	32	38	35	28	38	32	24	38	29	21	38	26	19	38	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	38	29	21	38	25	18	38	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	36	36	36	36	36	36	36	36	35	36	36	31	36	36	27	36	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	36	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	185	185	185	185	185	185	185	185	185	185	185	185	185	185	100	185	185	74	185	146	62	185	89	52	149	64	45	93	55	39	67	48	34	58	42	30	51	37	26
			Exposed	185	185	99	185	185	69	185	126	60	185	94	54	185	74	49	141	63	44	105	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	68	183	183	60	183	71	55	183	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	183	183	67	183	183	58	183	64	52	183	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	88	181	76	53	181	58	43	113	50	36	80	44	30	66	38	26	58	34	23
			Exposed	181	181	181	181	181	181	181	181	64	181	84	55	181	63	48	181	57	43	154	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	71	175	93	55	175	63	46	61	55	39	54	48	34	48	43	29
			Exposed	175	175	175	175	175	175	175	175	136	175	175	77	175	175	61	175	88	54	175	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	185	185	140	185	185	85	185	164	64	185	114	58	185	88	52	185	70	48	132	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	185	87	52	174	67	46	114	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	183	183	183	183	183	63	183	82	56	183	62	51	183	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	183	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	181	181	181	181	181	181	181	181	174	181	181	60	181	75	53	181	61	47	181	56	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	181	73	53	181	60	45	181	54	39	98	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	106	175	175	71	175	125	59	175	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	175	175	70	175	108	57	175	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	185	185	70	185	127	60	185	93	54	185	73	48	135	62	44	100	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	133	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	183	183	59	183	64	53	183	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	181	181	181	181	181	64	181	83	55	181	62	48	181	56	42	132	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	181	56	42	114	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	175	175	175	175	175	141	175	175	76	175	143	60	175	84	53	175	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	175	83	53	175	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
10	B	0-7	Interior	135	135	135	135	135	135	135	135	135	135	135	135	135	135	100	135	135	74	135	135	62	135	89	52	135	64	45	93	55	39	67	48	34	58	42	30	51	37	26
			Exposed	135	135	99	135	135	69	135	126	60	135	94	54	135	74	49	135	63	44	105	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	68	136	136	60	136	71	55	136	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	136	136	67	136	136	58	136	64	52	136	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	88	178	76	53	178	58	43	113	50	36	80	44	30	66	38	26	58	34	23
			Exposed	178	178	178	178	178	178	178	178	64	178	84	55	178	63	48	178	57	43	154	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	71	175	93	55	175	63	46	61	55	39	54	48	34	48	43	29
			Exposed	175	175	175	175	175	175	175	175	136	175	175	77	175	175	61	175	88	54	175	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	135	135	135	135	135	85	135	135	64	135	114	58	135	88	52	135	70	48	132	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	135	87	52	135	67	46	114	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	136	136	136	136	136	63	136	82	56	136	62	51	136	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	136	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	178	178	178	178	178	178	178	178	174	178	178	60	178	75	53	178	61	47	178	56	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	178	73	53	178	60	45	178	54	39	98	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	106	175	175	71	175	125	59	175	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	175	175	70	175	108	57	175	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	135	135	70	135	127	60	135	93	54	135	73	48	135	62	44	100	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	133	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	136	136	59	136	64	53	136	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	181	181	181	181	181	64	181	83	55	181	62	48	181	56	42	132	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	181	56	42	114	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	175	175	175	175	175	141	175	175	76	175	143	60	175	84	53	175	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	175	83	53	175	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
20	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	74	94	94	62	94	89	52	94	64	45	93	55	39	67	48	34	58	42	30	51	37	26
			Exposed	94	94	94	94	94	69	94	94	60	94	94	54	94	74	49	94	63	44	94	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	68	95	95	60	95	71	55	95	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	95	95	67	95	95	58	95	64	52	95	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	88	140	76	53	140	58	43	113	50	36	80	44	30	66	38	26	58	34	23
			Exposed	140	140	140	140	140	140	140	140	64	140	84	55	140	63	48	140	57	43	140	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	71	137	93	55	137	63	46	61	55	39	54	48	34	48	43	29
			Exposed	137	137	137	137	137	137	137	137	136	137	137	77	137	137	61	137	88	54	137	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	94	94	94	94	94	85	94	94	64	94	94	58	94	88	52	94	70	48	94	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	94	87	52	94	67	46	94	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	95	95	95	95	95	63	95	82	56	95	62	51	95	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	95	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	75	140	140	61	140	140	56	140	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	140	73	53	140	60	45	140	54	39	98	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	137	137	137	137	137	137	137	137	137	137	137	106	137	137	71	137	125	59	137	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	137	137	70	137	108	57	137	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	94	94	70	94	94	60	94	93	54	94	73	48	94	62	44	94	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	94	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	95	95	59	95	64	53	95	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	147	147	147	147	147	64	147	83	55	147	62	48	147	56	42	132	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	147	56	42	114	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	146	146	146	146	146	141	146	146	76	146	143	60	146	84	53	146	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	146	83	53	146	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	74	91	91	62	91	89	52	91	64	45	91	55	39	67	48	34	58	42	30	51	37	26
			Exposed	91	91	91	91	91	69	91	91	60	91	91	54	91	74	49	91	63	44	91	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	68	95	95	60	95	71	55	95	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	95	95	67	95	95	58	95	64	52	95	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	88	108	76	53	108	58	43	108	50	36	80	44	30	66	38	26	58	34	23
			Exposed	108	108	108	108	108	108	108	108	64	108	84	55	108	63	48	108	57	43	108	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	71	100	93	55	100	63	46	61	55	39	54	48	34	48	43	29
			Exposed	100	100	100	100	100	100	100	100	100	100	100	77	100	100	61	100	88	54	100	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	91	91	91	91	91	85	91	91	64	91	91	58	91	88	52	91	70	48	91	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	91	87	52	91	67	46	91	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	95	95	95	95	95	63	95	82	56	95	62	51	95	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	95	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	60	108	75	53	108	61	47	108	56	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	108	73	53	108	60	45	108	54	39	98	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	71	100	100	59	100	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	100	100	70	100	100	57	100	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	94	94	70	94	94	60	94	93	54	94	73	48	94	62	44	94	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	94	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	95	95	59	95	64	53	95	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	117	117	117	117	117	64	117	83	55	117	62	48	117	56	42	117	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	117	56	42	114	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	109	109	109	109	109	109	109	109	76	109	109	60	109	84	53	109	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	109	83	53	109	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
40	B	0-7	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	76	76	62	76	76	52	76	64	45	76	55	39	67	48	34	58	42	30	51	37	26
			Exposed	76	76	76	76	76	69	76	76	60	76	76	54	76	74	49	76	63	44	76	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	68	80	80	60	80	71	55	80	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	80	80	67	80	80	58	80	64	52	80	57	47	80	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	76	53	84	58	43	84	50	36	80	44	30	66	38	26	58	34	23
			Exposed	84	84	84	84	84	84	84	84	64	84	84	55	84	63	48	84	57	43	84	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	71	79	79	55	79	63	46	61	55	39	54	48	34	48	43	29
			Exposed	79	79	79	79	79	79	79	79	79	79	79	77	79	79	61	79	79	54	79	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	76	76	76	76	76	76	76	76	64	76	76	58	76	76	52	76	70	48	76	62	43	76	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	76	76	52	76	67	46	76	59	42	76	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	80	80	80	80	80	63	80	80	56	80	62	51	80	56	46	80	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	80	56	46	80	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	60	84	75	53	84	61	47	84	56	42	84	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	84	73	53	84	60	45	84	54	39	84	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	71	79	79	59	79	79	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	79	79	70	79	79	57	79	72	50	79	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	81	81	70	81	81	60	81	81	54	81	73	48	81	62	44	81	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	81	62	44	81	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	86	86	59	86	64	53	86	57	47	86	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	92	92	92	92	92	64	92	83	55	92	62	48	92	56	42	92	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	92	56	42	92	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	86	86	86	86	86	86	86	86	76	86	86	60	86	84	53	86	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	86	83	53	86	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
50	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	52	62	62	45	62	55	39	62	48	34	58	42	30	51	37	26			
			Exposed	62	62	62	62	62	62	62	62	60	62	62	54	62	62	49	62	62	44	62	57	40	62	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	60	67	67	55	67	56	46	67	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	67	67	67	67	67	58	67	64	52	67	57	47	67	52	43	67	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	53	69	58	43	69	50	36	69	44	30	66	38	26	58	34	23
			Exposed	69	69	69	69	69	69	69	69	64	69	69	55	69	63	48	69	57	43	69	52	38	69	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	55	65	63	46	61	55	39	54	48	34	48	43	29			
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	54	65	65	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	58	62	62	52	62	62	48	62	62	43	62	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	62	62	52	62	62	46	62	59	42	62	53	38	62	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	67	67	67	67	67	63	67	67	56	67	62	51	67	56	46	67	51	42	67	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	67	56	46	67	50	41	67	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	60	69	69	53	69	61	47	69	56	42	69	47	34	69	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	69	69	53	69	60	45	69	54	39	69	48	35	69	44	31	69	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	53	65	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	65	65	65	65	65	57	65	65	50	65	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	68	68	68	68	68	60	68	68	54	68	68	48	68	62	44	68	56	40	68	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	68	62	44	68	55	39	68	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	74	74	59	74	64	53	74	57	47	74	52	42	74	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	74	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	75	75	75	75	75	64	75	75	55	75	62	48	75	56	42	75	51	37	75	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	75	56	42	75	50	36	75	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	60	71	71	53	71	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	71	71	53	71	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	45	52	52	39	52	48	34	52	42	30	51	37	26
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	49	52	52	44	52	52	40	52	48	34	52	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	55	57	56	46	57	48	39	57	41	34	55	36	30	49	32	26	43	28	23
			Exposed	57	57	57	57	57	57	57	57	52	57	57	47	57	52	43	57	47	39	57	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	43	58	50	36	58	44	30	58	38	26	58	34	23
			Exposed	58	58	58	58	58	58	58	58	58	58	58	55	58	58	48	58	57	43	58	52	38	58	44	31	58	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	46	55	55	39	54	48	34	48	43	29
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	49	55	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	43	52	52	37	52	44	31	52	38	27	46	34	24	41	30	21	36	26	19
			Exposed	52	52	52	52	52	46	52	52	42	52	52	38	52	48	34	52	44	31	52	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	57	57	57	57	57	57	57	57	56	57	57	51	57	56	46	57	51	42	57	46	38	57	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	57	56	46	57	50	41	57	44	37	57	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	47	58	56	42	58	47	34	58	41	28	58	35	24	52	31	21	46	27	18	41	24	16
			Exposed	58	58	53	58	58	45	58	54	39	58	48	35	58	44	31	58	40	27	58	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	43	55	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	55	55	55	55	55	55	55	55	50	55	55	44	55	55	40	55	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	58	58	58	58	58	58	58	58	54	58	58	48	58	58	44	58	56	40	58	52	36	58	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	58	58	44	58	55	39	58	49	35	58	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	62	62	59	62	62	53	62	57	47	62	52	42	62	47	39	62	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	62	46	38	62	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	64	64	64	64	64	64	64	64	55	64	62	48	64	56	42	64	51	37	64	47	33	64	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	64	56	42	64	50	36	64	45	32	64	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	60	61	61	53	61	61	48	61	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	61	61	53	61	61	46	61	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
70	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	39	45	45	34	45	42	30	45	37	26
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	40	45	45	34	45	41	29	45	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	48	39	49	41	34	49	36	30	49	32	26	43	28	23			
			Exposed	49	49	49	49	49	49	49	49	49	49	49	47	49	49	43	49	47	39	49	43	36	49	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43	50	50	36	50	40	30	50	38	26	50	34	23			
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	50	38	50	44	31	50	38	26	50	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	39	48	48	34	48	43	29
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	40	48	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	37	45	44	31	45	38	27	45	34	24	41	30	21	36	26	19
			Exposed	45	45	45	45	45	45	45	45	42	45	45	38	45	45	34	45	44	31	45	40	28	45	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	42	49	46	38	49	39	32	49	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	49	49	46	49	49	41	49	44	37	49	40	33	49	36	30	49	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	42	50	47	34	50	41	28	50	35	24	50	31	21	46	27	18	41	24	16
			Exposed	50	50	50	50	50	45	50	50	39	50	48	35	50	44	31	50	40	27	50	37	25	50	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	36	48	44	30	43	38	26	38	34	22	34	30	19
			Exposed	48	48	48	48	48	48	48	48	48	48	48	44	48	48	40	48	48	35	48	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	48	50	50	44	50	50	40	50	50	36	50	44	31	50	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	50	50	44	50	50	39	50	49	35	50	45	31	50	40	29	50	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	54	54	54	54	54	53	54	54	47	54	52	42	54	47	39	54	42	35	54	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	54	46	38	54	41	34	54	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	51	37	55	47	33	55	40	27	55	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	55	55	42	55	50	36	55	45	32	55	41	28	55	37	25	55	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	53	43	53	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	53	53	53	53	53	46	53	53	41	53	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34	40	40	30	40	37	26
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	29	40	36	25	40	31	22	38	28	19	34	24	17
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	41	34	43	36	30	43	32	26	43	28	23			
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	37	30	43	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	36	44	44	30	44	44	30	44	38	26	44	34	23
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	38	44	44	31	44	38	26	44	33	22	44	29	20	43	25	17	38	22	15
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	34	42	42	29
			Exposed	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	33	42	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	31	40	38	27	40	34	24	40	30	21	36	26	19
			Exposed	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	28	40	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	38	43	39	32	43	34	28	43	29	24	39	25	21	34	22	18	30	20	16
			Exposed	43	43	43	43	43	41	43	43	37	43	40	33	43	36	30	43	33	27	43	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	34	44	41	28	44	35	24	44	31	21	44	27	18	41	24	16
			Exposed	44	44	44	44	44	44	44	44	39	44	44	35	44	44	31	44	40	27	44	37	25	44	31	21	44	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	36	42	42	30	42	38	26	38	34	22	34	30	19			
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	35	42	42	32	42	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	36	44	44	31	44	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	44	44	44	44	44	39	44	44	35	44	44	31	44	40	29	44	37	26	44	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	48	48	48	48	48	48	48	48	47	48	48	42	48	47	39	48	42	35	48	39	32	48	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	48	46	38	48	41	34	48	37	31	48	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	48	49	49	42	49	49	37	49	47	33	49	40	27	49	34	23	49	29	20	44	26	18	39	23	15	34	20	14
			Exposed	49	49	42	49	49	36	49	45	32	49	41	28	49	37	25	49	34	23	49	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	43	47	47	35	47	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	47	47	47	47	47	46	47	47	41	47	47	36	47	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	26				
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	25	35	31	22	35	28	19	34	24	17
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	30	38	32	26	38	28	23
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	37	30	38	31	26	38	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	30	40	38	26	40	34	23
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	31	40	38	26	40	33	22	40	29	20	40	25	17	38	22	15
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	29	
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	33	38	38	28	38	36	24	35	32	21	31	28	18
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	27	35	34	24	35	30	21	35	26	19
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	35	28	35	34	24	35	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	32	38	34	28	38	29	24	38	25	21	34	22	18	30	20	16
			Exposed	38	38	38	38	38	38	38	38	37	38	38	33	38	36	30	38	33	27	38	30	25	38	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	28	40	35	24	40	31	21	40	27	18	40	24	16
			Exposed	40	40	40	40	40	40	40	40	39	40	40	35	40	40	31	40	40	27	40	37	25	40	31	21	40	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	30	38	38	26	38	34	22	34	30	19
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12			
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	31	39	37	26	39	32	23	39	28	20	34	25	18	30	22	16			
			Exposed	39	39	39	39	39	39	39	39	35	39	39	31	39	39	29	39	37	26	39	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	35	42	39	32	42	33	27	42	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	42	42	38	42	41	34	42	37	31	42	34	28	42	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	37	44	44	33	44	40	27	44	34	23	44	29	20	44	26	18	39	23	15	34	20	14
			Exposed	44	44	42	44	44	36	44	44	32	44	41	28	44	37	25	44	34	23	44	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	35	42	42	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	42	42	42	42	42	42	42	42	41	42	42	36	42	42	32	42	42	29	42	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
100	B	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	26			
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	25	32	31	22	32	28	19	32	24	17
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30	35	32	26	35	28	23
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	31	26	35	27	22	35	24	20	32	21	17	28	18	15
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	36	26	36	34	23
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	36	26	36	33	22	36	29	20	36	25	17	36	22	15
		27-45	Interior	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	34	34	34	34	34	34	29			
			Exposed	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	24	34	32	21	31	28	18			
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	27	32	32	24	32	30	21	32	26	19
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	32	24	32	29	21	32	25	18	30	22	16	27	19	14	24	17	12			
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	34	28	35	29	24	35	25	21	34	22	18	30	20	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	30	35	33	27	35	30	25	35	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	28	36	35	24	36	31	21	36	27	18	36	24	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	35	36	36	31	36	36	27	36	36	25	36	31	21	36	27	18	36	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	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	30	34	34	26	34	34	22	34	30	19
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	26	34	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	26	35	32	23	35	28	20	34	25	18	30	22	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	31	35	35	29	35	35	26	35	34	24	35	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	33	27	38	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	38	38	38	38	38	34	38	37	31	38	34	28	38	30	25	38	28	23	38	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	40	27	40	34	23	40	29	20	40	26	18	39	23	15	34	20	14
			Exposed	40	40	40	40	40	36	40	40	32	40	40	28	40	37	25	40	34	23	40	31	21	40	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	29	38	37	25	36	32	21	32	28	18	28	25	16
			Exposed	38	38	38	38	38	38	38	38	38	38	38	36	38	38	32	38	38	29	38	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	113	113	94	113	113	77	113	113	65	113	91	55	113	78	47	113	68	42	98	60	38	75	47	32	59	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	113	78	47	113	66	40	91	56	36	78	48	33	67	42	30	58	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	112	112	83	112	96	66	112	77	55	112	64	46	89	53	40	77	46	36	68	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	87	53	40	74	44	36	65	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	106	106	106	106	106	106	106	106	83	106	88	67	106	73	56	106	62	47	106	53	41	80	41	32	66	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	106	73	55	106	60	45	98	50	38	83	42	33	73	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	101	101	101	101	101	101	101	101	99	101	101	83	101	101	70	101	87	60	101	75	52	74	57	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	101	101	69	101	84	58	96	70	49	77	59	42	64	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	113	87	52	113	73	44	105	62	39	87	53	35	74	46	32	65	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	74	46	32	62	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	112	60	43	81	49	38	71	42	34	62	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	106	83	63	106	68	51	106	56	42	93	47	37	80	41	32	71	37	28	63	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	80	41	32	69	36	28	60	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	101	101	78	101	95	65	101	79	54	90	66	46	73	57	40	61	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	73	56	40	59	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	113	66	41	92	56	36	77	48	33	66	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	75	44	36	65	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	106	60	46	99	50	38	83	42	33	72	38	29	64	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	63	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	101	85	58	97	70	49	77	59	42	63	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
10	B	0-7	Interior	83	83	83	83	83	77	83	83	65	83	83	55	83	78	47	83	68	42	83	60	38	75	47	32	59	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	83	78	47	83	66	40	83	56	36	78	48	33	67	42	30	58	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	83	83	83	83	83	66	83	77	55	83	64	46	83	53	40	77	46	36	68	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	83	53	40	74	44	36	65	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	92	92	92	92	92	92	92	92	83	92	88	67	92	73	56	92	62	47	92	53	41	80	41	32	66	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	92	73	55	92	60	45	92	50	38	83	42	33	73	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	87	87	87	87	87	87	87	87	87	87	87	83	87	87	70	87	87	60	87	75	52	74	57	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	87	87	69	87	84	58	87	70	49	77	59	42	64	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	83	83	52	83	73	44	83	62	39	83	53	35	74	46	32	65	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	74	46	32	62	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	83	60	43	81	49	38	71	42	34	62	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	92	83	63	92	68	51	92	56	42	92	47	37	80	41	32	71	37	28	63	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	80	41	32	69	36	28	60	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	87	87	78	87	87	65	87	79	54	87	66	46	73	57	40	61	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	73	56	40	59	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	83	66	41	83	56	36	77	48	33	66	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	75	44	36	65	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	95	60	46	95	50	38	83	42	33	72	38	29	64	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	63	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	90	85	58	90	70	49	77	59	42	63	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
20	B	0-7	Interior	57	57	57	57	57	57	57	57	57	57	57	55	57	57	47	57	57	42	57	57	38	57	47	32	57	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	57	57	47	57	57	40	57	56	36	57	48	33	57	42	30	57	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	55	58	58	46	58	53	40	58	46	36	58	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	58	53	40	58	44	36	58	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	67	71	71	56	71	62	47	71	53	41	71	41	32	66	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	71	71	55	71	60	45	71	50	38	71	42	33	71	38	29	65	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	60	68	68	52	68	57	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	68	68	68	68	68	58	68	68	49	68	59	42	64	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	57	57	52	57	57	44	57	57	39	57	53	35	57	46	32	57	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	57	46	32	57	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	58	58	43	58	49	38	58	42	34	58	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	71	71	63	71	68	51	71	56	42	71	47	37	71	41	32	71	37	28	63	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	71	41	32	69	36	28	60	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	68	68	68	68	68	65	68	68	54	68	66	46	68	57	40	61	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	68	56	40	59	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	41	57	56	36	57	48	33	57	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	58	44	36	58	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	74	60	46	74	50	38	74	42	33	72	38	29	64	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	63	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	71	71	58	71	70	49	71	59	42	63	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	56	56	56	56	56	56	56	56	56	56	56	55	56	56	47	56	56	42	56	56	38	56	47	32	56	39	27	48	33	24	40	29	20	35	26	18	31	23	16
			Exposed	56	56	47	56	56	40	56	56	36	56	48	33	56	42	30	56	38	27	51	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	58	58	58	58	58	58	58	58	55	58	58	46	58	53	40	58	46	36	58	40	33	55	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	58	53	40	58	44	36	58	39	32	57	35	29	50	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	58	47	58	53	41	58	41	32	58	35	26	55	30	22	46	27	18	40	23	16	36	21	14
			Exposed	58	58	55	58	58	45	58	50	38	58	42	33	58	38	29	58	35	26	58	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	41	55	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	55	55	55	55	55	55	55	55	49	55	55	42	55	51	37	54	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	56	56	52	56	56	44	56	56	39	56	53	35	56	46	32	56	41	29	56	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	56	46	32	56	40	28	53	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	58	58	43	58	49	38	58	42	34	58	38	31	55	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	55	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	58	58	58	58	58	51	58	56	42	58	47	37	58	41	32	58	37	28	58	34	25	51	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	58	41	32	58	36	28	58	33	24	53	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	55	55	55	55	55	55	55	55	54	55	55	46	55	55	40	55	49	36	52	43	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	55	55	40	55	47	35	48	41	31	41	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	57	57	41	57	56	36	57	48	33	57	42	29	57	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	57	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	58	44	36	58	39	32	56	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	61	60	46	61	50	38	61	42	33	61	38	29	61	34	26	57	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	61	34	25	55	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	59	59	58	59	59	49	59	59	42	59	50	37	53	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	52	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
40	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	42	46	46	38	46	46	32	46	39	27	46	33	24	40	29	20	35	26	18	31	23	16
			Exposed	46	46	46	46	46	40	46	46	36	46	46	33	46	42	30	46	38	27	46	35	25	41	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	46	49	49	40	49	46	36	49	40	33	49	34	28	45	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	49	49	40	49	44	36	49	39	32	49	35	29	49	32	26	45	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	41	32	49	35	26	49	30	22	46	27	18	40	23	16	36	21	14
			Exposed	49	49	49	49	49	45	49	49	38	49	42	33	49	38	29	49	35	26	49	32	23	47	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	41	47	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	47	47	47	47	47	47	47	47	47	47	47	42	47	47	37	47	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	46	46	46	46	46	44	46	46	39	46	46	35	46	46	32	46	41	29	46	38	26	44	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	46	46	32	46	40	28	46	36	25	46	32	23	41	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	49	49	43	49	49	38	49	42	34	49	38	31	49	34	28	49	31	25	44	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	49	34	28	47	30	25	42	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	49	49	49	49	49	49	49	49	42	49	47	37	49	41	32	49	37	28	49	34	25	49	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	49	41	32	49	36	28	49	33	24	49	29	21	47	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	41	47	45	33	43	38	28	37	33	24	33	29	20	29	26	18
			Exposed	47	47	47	47	47	47	47	47	47	47	47	42	47	47	37	47	44	33	46	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	D	0-7	Interior	50	50	41	50	50	36	50	48	33	50	42	29	50	38	27	50	34	24	44	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	50	38	26	48	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	53	44	36	53	39	32	53	35	29	50	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	52	52	46	52	50	38	52	42	33	52	38	29	52	34	26	52	31	23	51	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	52	34	25	52	30	22	48	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	50	50	50	50	50	49	50	50	42	50	50	37	50	43	32	45	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	50	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
50	B	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	32	38	38	27	38	33	24	38	29	20	35	26	18	31	23	16
			Exposed	38	38	38	38	38	38	38	38	36	38	38	33	38	38	30	38	38	27	38	35	25	38	29	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	40	41	41	36	41	40	33	41	34	28	41	29	24	39	25	21	34	22	18	30	19	16	26	17	14
			Exposed	41	41	40	41	41	36	41	39	32	41	35	29	41	32	26	41	29	24	40	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	41	32	42	35	26	42	30	22	42	27	18	40	23	16	36	21	14
			Exposed	42	42	42	42	42	42	42	42	38	42	42	33	42	38	29	42	35	26	42	32	23	42	27	19	39	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	33	40	38	28	37	33	24	33	29	20	29	26	18
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	40	30	38	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	29	38	38	26	38	32	22	37	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	38	38	32	38	38	28	38	36	25	38	32	23	38	29	21	37	27	19	34	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	41	41	41	41	41	38	41	41	34	41	38	31	41	34	28	41	31	25	41	28	23	37	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	41	34	28	41	30	25	41	27	22	38	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	42	42	42	42	42	42	42	42	42	42	42	37	42	41	32	42	37	28	42	34	25	42	29	20	42	25	17	37	21	14	32	19	13	28	16	11	25	14	10
			Exposed	42	41	32	42	36	28	42	33	24	42	29	21	42	27	19	42	24	17	38	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	32	40	36	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	40	40	40	40	40	35	40	40	31	40	37	27	37	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	42	42	41	42	42	36	42	42	33	42	42	29	42	38	27	42	34	24	42	31	22	37	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	42	38	26	42	33	24	42	30	21	37	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	45	44	36	45	39	32	45	35	29	45	31	26	44	28	23	40	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	44	28	23	39	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	45	45	45	45	45	38	45	42	33	45	38	29	45	34	26	45	31	23	45	29	20	42	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	45	34	25	45	30	22	45	27	19	42	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	43	43	43	43	43	43	43	43	42	43	43	37	43	43	32	43	39	29	40	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	43	43	32	43	38	28	38	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	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	27	32	32	24	32	29	20	32	26	18	31	23	16
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	27	32	32	25	32	29	21	32	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	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	29	24	34	25	21	34	22	18	30	19	16	26	17	14
			Exposed	34	34	34	34	34	34	34	34	32	34	34	29	34	32	26	34	29	24	34	26	22	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	30	22	35	27	18	35	23	16	35	21	14			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	35	26	35	32	23	35	27	19	35	23	16	34	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	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	28	34	33	24	33	29	20	29	26	18
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	30	34	34	24	32	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26	32	32	22	32	27	19	32	23	16	28	20	14	25	18	13	22	16	11
			Exposed	32	32	32	32	32	28	32	32	25	32	32	23	32	29	21	32	27	19	32	24	17	28	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	31	34	34	28	34	31	25	34	28	23	34	24	20	31	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	34	34	28	34	30	25	34	27	22	34	24	20	34	22	18	31	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	28	35	34	25	35	29	20	35	25	17	35	21	14	32	19	13	28	16	11	25	14	10
			Exposed	35	35	32	35	35	28	35	33	24	35	29	21	35	27	19	35	24	17	35	22	15	32	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	26	34	31	22	30	27	18	26	23	16	23	21	13	20	18	12
			Exposed	34	34	34	34	34	34	34	34	31	34	34	27	34	33	24	34	30	21	31	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	35	35	35	35	35	35	35	35	33	35	35	29	35	35	27	35	34	24	35	31	22	35	26	19	31	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	35	35	26	35	33	24	35	30	21	35	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	38	38	36	38	38	32	38	35	29	38	31	26	38	28	23	38	26	21	36	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	38	28	23	38	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	39	39	39	39	39	38	39	39	33	39	38	29	39	34	26	39	31	23	39	29	20	39	24	16	35	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	39	34	25	39	30	22	39	27	19	39	25	17	38	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	32	37	37	29	37	36	26	34	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	37	37	32	37	37	28	37	34	25	35	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
70	B	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	20	27	26	18	27	23	16
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	21	27	25	18	27	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	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	29	24	30	25	21	30	22	18	30	19	16	26	17	14
			Exposed	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	29	24	30	26	22	30	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	31	30	22	31	27	18	31	23	16	31	21	14
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	23	31	27	19	31	23	16	31	20	13	30	17	12	26	15	10	23	13	9
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	24	29	29	20	29	26	18
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	29	20	28	25	17	24	22	14	21	19	12	19	17	11
	C	0-7	Interior	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	19	27	23	16	27	20	14	25	18	13	22	16	11
			Exposed	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	27	19	27	24	17	27	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	28	23	30	24	20	30	20	17	27	18	14	24	15	13	21	13	11	18	12	10
			Exposed	30	30	28	30	30	25	30	27	22	30	24	20	30	22	18	30	20	17	28	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	29	20	31	25	17	31	21	14	31	19	13	28	16	11	25	14	10
			Exposed	31	31	31	31	31	28	31	31	24	31	29	21	31	27	19	31	24	17	31	22	15	31	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	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	22	29	27	18	26	23	16	23	21	13	20	18	12
			Exposed	29	29	29	29	29	29	29	29	29	29	29	27	29	29	24	29	29	21	29	28	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	27	30	30	24	30	30	22	30	26	19	30	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	30	30	26	30	30	24	30	30	21	30	27	19	30	24	17	30	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	33	33	33	33	33	32	33	33	29	33	31	26	33	28	23	33	26	21	33	24	19	31	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	33	28	23	33	25	21	33	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	34	34	34	34	34	34	34	34	33	34	34	29	34	34	26	34	31	23	34	29	20	34	24	16	34	21	14	31	18	12	27	16	11	23	14	9	21	12	8
			Exposed	34	34	25	34	30	22	34	27	19	34	25	17	34	22	15	34	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	26	32	30	21	29	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	32	32	32	32	32	28	32	32	25	32	31	22	31	28	19	29	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6
80	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	18	24	23	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	22	15	24	19	13	23	17	12	20	15	10
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	18	26	21	16	26	22	18	26	19	16	26	17	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	22	18	26	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	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	18	27	23	16	27	23	16	27	20	14
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	19	27	23	16	27	20	13	27	17	12	26	15	10	23	13	9
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	26	18
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	20	26	25	17	24	22	14	21	19	12	19	17	11			
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	13	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	21	14	24	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	24	20	26	20	17	26	18	14	24	15	13	21	13	11	18	12	10
			Exposed	26	26	26	26	26	25	26	26	22	26	24	20	26	22	18	26	20	17	26	18	15	24	15	13	20	13	11	18	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	20	27	25	17	27	21	14	27	19	13	27	16	11	24	14	9	21	12	8
			Exposed	27	27	27	27	27	27	27	27	24	27	27	21	27	27	19	27	24	17	27	22	15	27	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	21	26	26	19	26	24	16	23	20	13	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	24	27	27	22	27	26	19	27	23	16	27	20	14	23	17	12	21	15	11	18	13	9
			Exposed	27	27	26	27	27	24	27	27	21	27	27	19	27	24	17	27	22	16	27	24	17	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	26	29	28	23	29	26	21	29	24	19	29	20	16	26	17	14	23	15	12	20	13	11	17	11	9	15	10	8
			Exposed	29	28	23	29	25	21	29	23	19	29	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	30	23	30	29	20	30	24	16	30	21	14	30	18	12	27	16	11	23	14	9	21	12	8
			Exposed	30	30	25	30	30	22	30	27	19	30	25	17	30	22	15	30	20	14	30	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	14	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	21	28	26	18	25	22	15	22	20	13	19	17	11	17	15	9
			Exposed	28	28	28	28	28	28	28	28	25	28	28	22	28	28	19	28	26	17	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	188	188	188	188	188	188	188	188	188	188	188	188	188	188	109	188	188	78	188	157	64	188	93	54	161	65	46	99	56	40	71	49	35	59	43	30	53	38	27
			Exposed	188	188	107	188	188	73	188	134	61	188	99	55	188	78	50	153	64	45	112	59	41	72	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	187	187	187	187	187	187	187	187	187	187	187	187	187	187	77	187	187	61	187	79	56	187	57	47	81	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	187	187	75	187	187	60	187	65	54	187	59	48	92	53	44	79	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	171	178	84	54	178	59	44	126	51	37	83	45	31	68	39	27	60	35	24
			Exposed	178	178	178	178	178	178	178	178	70	178	95	56	178	64	49	178	58	44	178	53	39	84	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	77	169	102	56	169	64	47	62	56	40	55	49	35	49	44	30
			Exposed	169	169	169	169	169	169	169	169	169	169	169	84	169	169	63	169	96	55	169	70	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	188	188	168	188	188	91	188	179	66	188	121	59	188	92	53	188	74	49	142	63	44	86	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	188	91	53	188	70	47	122	60	43	91	54	38	72	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	187	187	187	187	187	64	187	96	58	187	63	52	187	57	47	89	52	43	77	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	187	57	47	85	51	42	72	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	178	178	178	178	178	178	178	178	178	178	178	63	178	82	54	178	63	48	178	57	43	97	48	34	74	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	178	80	54	178	61	46	178	55	40	107	50	35	84	45	31	73	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	169	169	169	169	169	169	169	169	169	169	169	121	169	169	76	169	157	61	169	89	54	87	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	169	169	75	169	122	59	169	77	51	169	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	188	188	75	188	135	61	188	98	55	188	76	49	145	63	45	106	58	41	84	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	143	63	44	99	56	40	76	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	187	187	60	187	65	54	187	58	48	91	53	43	78	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	77	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	178	178	178	178	178	71	178	93	56	178	64	49	178	58	43	161	53	38	94	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	178	57	43	128	51	37	87	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	169	169	169	169	169	169	169	169	83	169	169	62	169	91	55	169	67	49	79	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	169	90	54	169	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
10	B	0-7	Interior	139	139	139	139	139	139	139	139	139	139	139	139	139	139	109	139	139	78	139	139	64	139	93	54	139	65	46	99	56	40	71	49	35	59	43	30	53	38	27
			Exposed	139	139	107	139	139	73	139	134	61	139	99	55	139	78	50	139	64	45	112	59	41	72	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	140	140	140	140	140	140	140	140	140	140	140	140	140	140	77	140	140	61	140	79	56	140	57	47	81	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	140	140	75	140	140	60	140	65	54	140	59	48	92	53	44	79	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	84	54	154	59	44	126	51	37	83	45	31	68	39	27	60	35	24
			Exposed	154	154	154	154	154	154	154	154	70	154	95	56	154	64	49	154	58	44	154	53	39	84	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	77	146	102	56	146	64	47	62	56	40	55	49	35	49	44	30
			Exposed	146	146	146	146	146	146	146	146	146	146	146	84	146	146	63	146	96	55	146	70	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	139	139	139	139	139	91	139	139	66	139	121	59	139	92	53	139	74	49	139	63	44	86	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	139	91	53	139	70	47	122	60	43	91	54	38	72	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	140	140	140	140	140	64	140	96	58	140	63	52	140	57	47	89	52	43	77	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	140	57	47	85	51	42	72	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	154	154	154	154	154	154	154	154	154	154	154	63	154	82	54	154	63	48	154	57	43	97	48	34	74	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	154	80	54	154	61	46	154	55	40	107	50	35	84	45	31	73	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	146	146	146	146	146	146	146	146	146	146	146	121	146	146	76	146	146	61	146	89	54	87	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	146	146	75	146	122	59	146	77	51	146	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	139	139	75	139	135	61	139	98	55	139	76	49	139	63	45	106	58	41	84	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	139	63	44	99	56	40	76	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	140	140	60	140	65	54	140	58	48	91	53	43	78	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	77	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	159	159	159	159	159	71	159	93	56	159	64	49	159	58	43	159	53	38	94	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	159	57	43	128	51	37	87	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	151	151	151	151	151	151	151	151	83	151	151	62	151	91	55	151	67	49	79	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	151	90	54	151	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
20	B	0-7	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	78	96	96	64	96	93	54	96	65	46	96	56	40	71	49	35	59	43	30	53	38	27
			Exposed	96	96	96	96	96	73	96	96	61	96	96	55	96	78	50	96	64	45	96	59	41	72	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	77	97	97	61	97	79	56	97	57	47	81	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	97	97	75	97	97	60	97	65	54	97	59	48	92	53	44	79	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	84	54	119	59	44	119	51	37	83	45	31	68	39	27	60	35	24
			Exposed	119	119	119	119	119	119	119	119	70	119	95	56	119	64	49	119	58	44	119	53	39	84	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	77	114	102	56	114	64	47	62	56	40	55	49	35	49	44	30
			Exposed	114	114	114	114	114	114	114	114	114	114	114	84	114	114	63	114	96	55	114	70	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	96	96	75	96	96	91	96	96	66	96	96	59	96	92	53	96	74	49	96	63	44	86	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	96	91	53	96	70	47	96	60	43	91	54	38	72	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	97	97	97	97	97	64	97	96	58	97	63	52	97	57	47	89	52	43	77	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	97	57	47	85	51	42	72	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	119	119	119	119	119	119	119	119	119	119	119	63	119	82	54	119	63	48	119	57	43	97	48	34	74	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	119	80	54	119	61	46	119	55	40	107	50	35	84	45	31	73	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	114	114	114	114	114	114	114	114	114	114	114	114	114	114	76	114	114	61	114	89	54	87	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	114	114	75	114	114	59	114	77	51	114	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	96	96	75	96	96	61	96	96	55	96	76	49	96	63	45	96	58	41	84	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	96	63	44	96	56	40	76	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	97	97	60	97	65	54	97	58	48	91	53	43	78	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	77	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	125	125	125	125	125	71	125	93	56	125	64	49	125	58	43	125	53	38	94	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	125	57	43	125	51	37	87	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	119	119	119	119	119	119	119	119	83	119	119	62	119	91	55	119	67	49	79	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	119	90	54	119	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	64	94	93	54	94	65	46	94	56	40	71	49	35	59	43	30	53	38	27
			Exposed	94	94	94	94	94	73	94	94	61	94	94	55	94	78	50	94	64	45	94	59	41	72	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	77	97	97	61	97	79	56	97	57	47	81	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	97	97	75	97	97	60	97	65	54	97	59	48	92	53	44	79	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	84	54	97	59	44	97	51	37	83	45	31	68	39	27	60	35	24
			Exposed	97	97	97	97	97	97	97	97	70	97	95	56	97	64	49	97	58	44	97	53	39	84	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	77	93	93	56	93	64	47	62	56	40	55	49	35	49	44	30
			Exposed	93	93	93	93	93	93	93	93	93	93	93	84	93	93	63	93	93	55	93	70	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	94	94	94	94	94	91	94	94	66	94	94	59	94	92	53	94	74	49	94	63	44	86	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	94	91	53	94	70	47	94	60	43	91	54	38	72	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	97	97	97	97	97	64	97	96	58	97	63	52	97	57	47	89	52	43	77	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	97	57	47	85	51	42	72	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	97	97	97	97	97	97	97	97	97	97	97	63	97	82	54	97	63	48	97	57	43	97	48	34	74	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	97	80	54	97	61	46	97	55	40	97	50	35	84	45	31	73	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	93	93	93	93	93	93	93	93	93	93	93	93	93	93	76	93	93	61	93	89	54	87	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	93	93	75	93	93	59	93	77	51	93	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	96	96	75	96	96	61	96	96	55	96	76	49	96	63	45	96	58	41	84	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	96	63	44	96	56	40	76	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	97	97	60	97	65	54	97	58	48	91	53	43	78	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	77	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	102	102	102	102	102	71	102	93	56	102	64	49	102	58	43	102	53	38	94	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	102	57	43	102	51	37	87	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	98	98	98	98	98	98	98	98	83	98	98	62	98	91	55	98	67	49	79	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	98	90	54	98	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
40	B	0-7	Interior	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	64	77	77	54	77	65	46	77	56	40	71	49	35	59	43	30	53	38	27
			Exposed	77	77	77	77	77	73	77	77	61	77	77	55	77	77	50	77	64	45	77	59	41	72	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	82	82	82	82	82	82	82	82	82	82	82	82	82	82	77	82	82	61	82	79	56	82	57	47	81	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	82	82	75	82	82	60	82	65	54	82	59	48	82	53	44	79	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	54	81	59	44	81	51	37	81	45	31	68	39	27	60	35	24
			Exposed	81	81	81	81	81	81	81	81	70	81	81	56	81	64	49	81	58	44	81	53	39	81	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	78	78	56	78	64	47	62	56	40	55	49	35	49	44	30
			Exposed	78	78	78	78	78	78	78	78	78	78	78	78	78	78	63	78	78	55	78	70	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	77	77	77	77	77	77	77	77	66	77	77	59	77	77	53	77	74	49	77	63	44	77	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	77	77	53	77	70	47	77	60	43	77	54	38	72	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	82	82	82	82	82	64	82	82	58	82	63	52	82	57	47	82	52	43	77	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	82	57	47	82	51	42	72	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	81	81	81	81	81	81	81	81	81	81	81	63	81	81	54	81	63	48	81	57	43	81	48	34	74	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	81	80	54	81	61	46	81	55	40	81	50	35	81	45	31	73	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76	78	78	61	78	78	54	78	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	78	78	75	78	78	59	78	77	51	78	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	83	83	75	83	83	61	83	83	55	83	76	49	83	63	45	83	58	41	83	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	83	63	44	83	56	40	76	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	88	88	60	88	65	54	88	58	48	88	53	43	78	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	77	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	87	87	87	87	87	71	87	87	56	87	64	49	87	58	43	87	53	38	87	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	87	57	43	87	51	37	87	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	83	83	83	83	83	83	83	83	83	83	83	62	83	83	55	83	67	49	79	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	83	83	54	83	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
50	B	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	54	63	63	46	63	56	40	63	49	35	59	43	30	53	38	27			
			Exposed	63	63	63	63	63	63	63	63	61	63	63	55	63	63	50	63	63	45	63	59	41	63	50	35	58	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	61	69	69	56	69	57	47	69	49	40	65	42	35	57	37	31	50	33	27	44	29	24
			Exposed	69	69	69	69	69	60	69	65	54	69	59	48	69	53	44	69	48	40	69	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	54	70	59	44	70	51	37	70	45	31	68	39	27	60	35	24
			Exposed	70	70	70	70	70	70	70	70	70	70	70	56	70	64	49	70	58	44	70	53	39	70	45	31	67	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	56	66	64	47	62	56	40	55	49	35	49	44	30
			Exposed	66	66	66	66	66	66	66	66	66	66	66	66	66	66	63	66	66	55	66	66	50	63	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	63	63	63	63	63	63	63	63	63	63	63	59	63	63	53	63	63	49	63	63	44	63	53	38	63	45	32	54	39	28	47	34	24	42	30	21	37	27	19
			Exposed	63	63	53	63	63	47	63	60	43	63	54	38	63	49	35	62	45	32	57	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	69	69	69	69	69	64	69	69	58	69	63	52	69	57	47	69	52	43	69	47	39	62	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	69	57	47	69	51	42	69	45	37	63	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	70	70	70	70	70	70	70	70	70	70	70	63	70	70	54	70	63	48	70	57	43	70	48	34	70	41	28	61	36	24	54	31	21	47	28	19	42	24	17
			Exposed	70	70	54	70	61	46	70	55	40	70	50	35	70	45	31	70	41	28	64	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	61	66	66	54	66	61	44	58	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	66	66	66	66	66	59	66	66	51	66	62	45	63	56	40	57	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	70	70	70	70	70	61	70	70	55	70	70	49	70	63	45	70	58	41	70	53	37	61	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	70	63	44	70	56	40	70	50	36	63	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	76	76	60	76	65	54	76	58	48	76	53	43	76	48	39	68	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	76	48	39	65	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	76	76	76	76	76	71	76	76	56	76	64	49	76	58	43	76	53	38	76	48	34	72	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	76	57	43	76	51	37	76	46	32	74	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	62	73	73	55	73	67	49	73	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	73	73	54	73	64	47	64	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	46	53	53	40	53	53	49	35	53	43	30	53	38	27
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	45	53	53	41	53	50	35	53	42	30	50	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	57	47	58	49	40	58	42	35	57	37	31	50	33	27	44	29	24
			Exposed	58	58	58	58	58	58	58	58	54	58	58	48	58	53	44	58	48	40	58	44	36	57	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	51	37	59	45	31	59	39	27	59	35	24			
			Exposed	59	59	59	59	59	59	59	59	59	59	59	56	59	59	49	59	58	44	59	53	39	59	45	31	59	39	26	57	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	47	56	56	40	55	49	35	49	44	30
			Exposed	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	56	56	50	56	56	41	54	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	53	44	53	53	38	53	45	32	53	39	28	47	34	24	42	30	21	37	27	19
			Exposed	53	53	53	53	53	47	53	53	43	53	53	38	53	49	35	53	45	32	53	41	29	48	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	58	58	58	58	58	58	58	58	58	58	58	52	58	57	47	58	52	43	58	47	39	58	40	33	53	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	58	57	47	58	51	42	58	45	37	58	41	34	57	37	31	52	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	59	59	59	54	59	59	48	59	57	43	59	48	34	59	41	28	59	36	24	54	31	21	47	28	19	42	24	17
			Exposed	59	59	54	59	59	46	59	55	40	59	50	35	59	45	31	59	41	28	59	37	26	54	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	54	56	56	44	56	52	37	50	45	31	44	39	26	39	35	23	34	31	20
			Exposed	56	56	56	56	56	56	56	56	51	56	56	45	56	56	40	56	51	36	52	47	33	44	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	59	59	59	59	59	59	59	59	55	59	59	49	59	59	45	59	58	41	59	53	37	59	44	31	52	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	59	59	44	59	56	40	59	50	36	59	46	32	57	41	29	52	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	64	64	60	64	64	54	64	58	48	64	53	43	64	48	39	64	43	36	61	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	64	48	39	64	42	35	58	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	65	65	65	65	65	65	65	65	56	65	64	49	65	58	43	65	53	38	65	48	34	65	41	28	59	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	65	57	43	65	51	37	65	46	32	65	42	28	65	38	26	59	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	55	62	62	49	62	60	44	57	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	62	62	54	62	62	47	62	58	42	58	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
70	B	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	46	46	35	46	43	30	46	38	27
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	46	46	41	46	46	35	46	42	30	46	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	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	49	40	50	42	35	50	37	31	50	33	27	44	29	24
			Exposed	50	50	50	50	50	50	50	50	50	50	50	48	50	50	44	50	48	40	50	44	36	50	37	31	49	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	37	51	45	31	51	39	27	51	35	24
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	44	51	51	39	51	45	31	51	39	26	51	33	23	50	29	20	44	26	18	39	23	16
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	40	49	49	35	49	44	30
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	41	49	48	34	47	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	38	46	45	32	46	39	28	46	34	24	42	30	21	37	27	19
			Exposed	46	46	46	46	46	46	46	46	43	46	46	38	46	46	35	46	45	32	46	41	29	46	35	25	41	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	43	50	47	39	50	40	33	50	34	28	45	30	25	40	26	21	35	23	19	31	20	17
			Exposed	50	50	47	50	50	42	50	45	37	50	41	34	50	37	31	50	34	28	47	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	48	51	51	43	51	48	34	51	41	28	51	36	24	51	31	21	47	28	19	42	24	17
			Exposed	51	51	51	51	51	46	51	51	40	51	50	35	51	45	31	51	41	28	51	37	26	51	32	22	46	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	37	49	45	31	44	39	26	39	35	23	34	31	20
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	48	34	47	42	29	41	37	24	36	32	21	32	29	19	29	26	16
	D	0-7	Interior	51	51	51	51	51	51	51	51	51	51	51	49	51	51	45	51	51	41	51	51	37	51	44	31	51	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	51	51	44	51	51	40	51	50	36	51	46	32	51	41	29	51	38	27	47	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	55	55	55	55	55	54	55	55	48	55	53	43	55	48	39	55	43	36	55	40	33	51	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	55	48	39	55	42	35	55	38	31	53	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	57	57	57	57	57	57	57	57	56	57	57	49	57	57	43	57	53	38	57	48	34	57	41	28	57	35	24	51	30	21	45	26	18	39	23	16	35	21	14
			Exposed	57	57	43	57	51	37	57	46	32	57	42	28	57	38	26	57	34	23	54	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	49	54	54	44	54	51	36	49	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	54	54	54	54	54	47	54	54	42	54	52	37	53	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	30	40	38	27
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	40	40	30	40	37	26	40	32	23	39	28	20	34	25	18
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	40	44	42	35	44	37	31	44	33	27	44	29	24
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	36	44	37	31	44	32	26	42	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	44	45	45	37	45	45	31	45	39	27	45	35	24
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	39	45	45	31	45	39	26	45	33	23	45	29	20	44	26	18	39	23	16
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	43	30
			Exposed	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	34	43	42	29	41	37	24	36	32	21	32	29	18
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	32	40	39	28	40	34	24	40	30	21	37	27	19
			Exposed	40	40	40	40	40	40	40	40	40	40	40	38	40	40	35	40	40	32	40	40	29	40	35	25	40	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	39	44	40	33	44	34	28	44	30	25	40	26	21	35	23	19	31	20	17
			Exposed	44	44	44	44	44	42	44	44	37	44	41	34	44	37	31	44	34	28	44	31	26	40	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	34	45	41	28	45	36	24	45	32	22	45	27	19	40	23	16	35	21	14
			Exposed	45	45	45	45	45	45	45	45	40	45	45	35	45	45	31	45	41	28	45	37	26	45	32	22	45	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	37	43	43	31	43	39	26	39	35	23	34	31	20
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	36	43	43	33	43	40	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	41	45	45	37	45	44	31	45	38	27	45	33	23	39	29	20	35	25	18	31	22	16
			Exposed	45	45	44	45	45	40	45	45	36	45	45	32	45	41	29	45	38	27	45	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	49	49	49	49	49	49	49	49	48	49	49	43	49	48	39	49	43	36	49	40	33	49	34	28	44	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	49	48	39	49	42	35	49	38	31	49	34	28	48	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	49	50	50	43	50	50	38	50	48	34	50	41	28	50	35	24	50	30	21	45	26	18	39	23	16	35	21	14
			Exposed	50	50	43	50	50	37	50	46	32	50	42	28	50	38	26	50	34	23	50	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	44	48	48	36	48	44	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	48	48	48	48	48	47	48	48	42	48	48	37	48	47	33	48	43	29	44	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	36	36	36	36	36	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	27			
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	30	36	36	26	36	32	23	36	28	20	34	25	18
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	37	31	39	33	27	39	29	24
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	37	31	39	32	26	39	28	23	37	24	20	33	21	18	29	19	16
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	37	41	41	31	41	39	27	41	35	24
			Exposed	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	41	41	31	41	39	26	41	33	23	41	29	20	41	26	18	39	23	16
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	30
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	39	29	39	37	24	36	32	21	32	29	18			
	C	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	32	36	36	28	36	34	24	36	30	21	36	27	19
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	32	36	36	29	36	35	25	36	30	21	35	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33	39	34	28	39	30	25	39	26	21	35	23	19	31	20	17
			Exposed	39	39	39	39	39	39	39	39	37	39	39	34	39	37	31	39	34	28	39	31	26	39	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	34	41	41	28	41	36	24	41	31	21	41	28	19	41	24	17
			Exposed	41	41	41	41	41	41	41	41	40	41	41	35	41	41	31	41	41	28	41	37	26	41	32	22	41	27	19	40	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	31	39	39	26	39	35	23	34	31	20
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	33	39	39	27	38	34	22	33	29	19	29	26	16	25	23	14	23	20	12			
	D	0-7	Interior	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	38	27	40	33	23	39	29	20	35	25	18	31	22	16
			Exposed	40	40	40	40	40	40	40	40	36	40	40	32	40	40	29	40	38	27	40	34	24	40	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	40	33	43	34	28	43	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	43	43	39	43	42	35	43	38	31	43	34	28	43	31	26	43	28	23	40	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	38	45	45	34	45	41	28	45	35	24	45	30	21	45	26	18	39	23	16	35	21	14
			Exposed	45	45	43	45	45	37	45	45	32	45	42	28	45	38	26	45	34	23	45	31	21	45	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	36	43	43	30	42	38	25	37	33	22	32	29	19	29	26	16
			Exposed	43	43	43	43	43	43	43	43	42	43	43	37	43	43	33	43	43	29	43	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10
100	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27
			Exposed	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	32	23	33	28	20	33	25	18
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	33	27	35	29	24
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	32	26	35	28	23	35	24	20	33	21	18	29	19	16
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	31	37	37	27	37	35	24
			Exposed	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	31	37	37	26	37	33	23	37	29	20	37	26	18	37	23	16
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	24	35	32	21	32	29	18			
	C	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	28	33	33	24	33	30	21	33	27	19
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	25	33	30	21	33	26	18	31	22	16	27	20	14	24	18	12
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	34	28	35	30	25	35	26	21	35	23	19	31	20	17
			Exposed	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	34	28	35	31	26	35	26	22	34	22	19	30	19	16	26	17	14	23	15	12	20	13	11
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	28	37	36	24	37	31	21	37	28	19	37	24	17
			Exposed	37	37	37	37	37	37	37	37	37	37	37	35	37	37	31	37	37	28	37	37	26	37	32	22	37	27	19	37	23	16	35	21	14	31	18	12	27	16	11
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	26	35	35	23	34	31	20
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	27	35	34	22	33	29	19	29	26	16	25	23	14	23	20	12
	D	0-7	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	36	27	36	33	23	36	29	20	35	25	18	31	22	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	32	36	36	29	36	36	27	36	34	24	36	29	21	34	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	33	39	34	28	39	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	39	39	39	39	39	35	39	38	31	39	34	28	39	31	26	39	28	23	39	26	21	34	22	18	29	19	16	25	16	13	22	14	12	19	13	10	17	11	9
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	38	41	41	34	41	41	28	41	35	24	41	30	21	41	26	18	39	23	16	35	21	14
			Exposed	41	41	41	41	41	37	41	41	32	41	41	28	41	38	26	41	34	23	41	31	21	41	27	18	39	23	16	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	30	39	38	25	37	33	22	32	29	19	29	26	16
			Exposed	39	39	39	39	39	39	39	39	39	39	39	37	39	39	33	39	39	29	39	39	27	37	33	22	32	29	18	28	25	15	24	22	13	21	19	12	19	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	94	94	79	94	94	65	94	91	54	94	77	46	94	66	40	94	57	35	82	50	32	63	39	27	50	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	94	65	39	92	55	34	77	47	30	65	40	27	56	35	25	49	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	94	94	70	94	80	56	94	65	46	94	53	38	75	45	34	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	73	44	33	62	37	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	88	88	88	88	88	88	88	88	70	88	74	56	88	62	47	88	52	39	88	45	34	67	35	27	55	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	88	61	46	88	50	38	82	42	32	69	35	28	61	32	24	54	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	84	84	84	84	84	84	84	84	83	84	84	69	84	84	59	84	73	50	84	63	43	62	48	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	84	84	58	84	70	48	81	59	41	65	50	35	54	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	94	73	44	94	61	37	86	52	33	73	45	29	62	39	27	54	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	62	39	26	52	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	94	50	36	68	41	32	59	35	29	52	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	88	70	53	88	57	43	88	47	35	78	40	31	67	34	27	59	31	24	53	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	67	34	27	58	30	23	50	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	84	84	66	84	79	54	84	66	45	75	56	39	61	48	34	51	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	61	47	34	49	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	93	56	34	77	47	30	65	40	27	55	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	63	37	30	54	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	88	51	38	83	42	32	69	35	28	60	32	24	53	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	53	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	84	71	49	81	59	41	64	49	35	53	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
10	B	0-7	Interior	69	69	69	69	69	65	69	69	54	69	69	46	69	66	40	69	57	35	69	50	32	63	39	27	50	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	69	65	39	69	55	34	69	47	30	65	40	27	56	35	25	49	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	70	70	70	70	70	56	70	65	46	70	53	38	70	45	34	64	38	30	57	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	70	44	33	62	37	30	54	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	77	77	77	77	77	77	77	77	70	77	74	56	77	62	47	77	52	39	77	45	34	67	35	27	55	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	77	61	46	77	50	38	77	42	32	69	35	28	61	32	24	54	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	69	73	73	59	73	73	50	73	63	43	62	48	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	73	73	58	73	70	48	73	59	41	65	50	35	54	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	69	69	44	69	61	37	69	52	33	69	45	29	62	39	27	54	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	62	39	26	52	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	70	50	36	68	41	32	59	35	29	52	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	77	70	53	77	57	43	77	47	35	77	40	31	67	34	27	59	31	24	53	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	67	34	27	58	30	23	50	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	73	73	66	73	73	54	73	66	45	73	56	39	61	48	34	51	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	61	47	34	49	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	69	56	34	69	47	30	65	40	27	55	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	63	37	30	54	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	79	51	38	79	42	32	69	35	28	60	32	24	53	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	53	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	75	71	49	75	59	41	64	49	35	53	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
20	B	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	46	48	48	40	48	48	35	48	48	32	48	39	27	48	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	48	48	39	48	48	34	48	47	30	48	40	27	48	35	25	48	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	49	49	49	49	49	49	49	49	46	49	49	38	49	45	34	49	38	30	49	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	49	44	33	49	37	30	49	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	59	59	59	59	59	59	59	59	59	59	59	56	59	59	47	59	52	39	59	45	34	59	35	27	55	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	59	59	46	59	50	38	59	42	32	59	35	28	59	32	24	54	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	50	56	56	43	56	48	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	56	56	56	56	56	48	56	56	41	56	50	35	54	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	48	48	44	48	48	37	48	48	33	48	45	29	48	39	27	48	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	48	39	26	48	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	49	49	36	49	41	32	49	35	29	49	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	59	59	53	59	57	43	59	47	35	59	40	31	59	34	27	59	31	24	53	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	59	34	27	58	30	23	50	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	56	56	56	56	56	54	56	56	45	56	56	39	56	48	34	51	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	56	47	34	49	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	47	30	48	40	27	48	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	37	30	49	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	62	51	38	62	42	32	62	35	28	60	32	24	53	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	53	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	59	59	49	59	59	41	59	49	35	53	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	46	47	47	40	47	47	35	47	47	32	47	39	27	47	32	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	47	47	39	47	47	34	47	47	30	47	40	27	47	35	25	47	32	22	43	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	49	49	49	49	49	49	49	49	46	49	49	38	49	45	34	49	38	30	49	34	28	46	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	49	44	33	49	37	30	49	32	27	47	29	24	42	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	47	48	48	39	48	45	34	48	35	27	48	29	22	46	25	18	39	22	15	34	19	13	30	17	12
			Exposed	48	48	46	48	48	38	48	42	32	48	35	28	48	32	24	48	29	22	48	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	34	46	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	46	46	46	46	46	46	46	46	41	46	46	35	46	43	31	45	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	47	47	44	47	47	37	47	47	33	47	45	29	47	39	27	47	34	24	47	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	47	39	26	47	34	24	44	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	49	49	36	49	41	32	49	35	29	49	31	26	46	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	46	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	48	48	48	48	48	43	48	47	35	48	40	31	48	34	27	48	31	24	48	29	21	43	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	48	34	27	48	30	23	48	27	20	44	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	46	46	46	46	46	46	46	46	45	46	46	39	46	46	34	46	41	30	44	36	27	34	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	46	46	34	46	40	29	40	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	48	48	34	48	47	30	48	40	27	48	35	24	48	32	22	42	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	47	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	49	37	30	49	32	27	47	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	51	51	38	51	42	32	51	35	28	51	32	24	51	29	21	47	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	51	29	21	46	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	49	49	49	49	49	41	49	49	35	49	42	31	44	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	44	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
40	B	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	32	39	39	27	39	32	23	39	28	20	34	24	17	30	21	15	26	19	13
			Exposed	39	39	39	39	39	34	39	39	30	39	39	27	39	35	25	39	32	22	39	29	20	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	41	41	41	41	41	41	41	41	41	41	41	38	41	41	34	41	38	30	41	34	28	41	28	23	38	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	41	41	33	41	37	30	41	32	27	41	29	24	41	26	22	37	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34	40	35	27	40	29	22	40	25	18	39	22	15	34	19	13	30	17	12
			Exposed	40	40	40	40	40	38	40	40	32	40	35	28	40	32	24	40	29	22	40	27	19	39	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	34	39	38	28	36	32	23	31	28	20	27	24	17	24	22	15
			Exposed	39	39	39	39	39	39	39	39	39	39	39	35	39	39	31	39	37	28	38	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	39	39	39	39	39	37	39	39	33	39	39	29	39	39	27	39	34	24	39	31	22	37	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	39	39	26	39	34	24	39	30	21	38	27	19	34	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	41	41	36	41	41	32	41	35	29	41	31	26	41	28	23	41	26	21	37	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	41	28	23	40	25	21	35	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	40	40	40	40	40	40	40	40	35	40	40	31	40	34	27	40	31	24	40	29	21	40	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	40	34	27	40	30	23	40	27	20	40	25	18	39	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	34	39	39	29	39	39	27	39	34	24	39	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	39	39	34	39	39	29	39	34	26	35	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	41	41	34	41	41	30	41	40	27	41	35	24	41	32	22	41	29	20	37	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	41	31	22	40	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	44	37	30	44	32	27	44	29	24	42	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	43	43	38	43	42	32	43	35	28	43	32	24	43	29	21	43	26	19	42	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	43	29	21	43	25	18	40	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	41	41	41	41	41	41	41	41	35	41	41	31	41	36	27	37	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	41	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5
50	B	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	27	31	31	23	31	28	20	31	24	17	30	21	15	26	19	13
			Exposed	31	31	31	31	31	31	31	31	30	31	31	27	31	31	25	31	31	22	31	29	20	31	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	30	34	34	28	34	28	23	34	24	20	32	21	17	28	18	15	25	16	13	22	14	12
			Exposed	34	34	33	34	34	30	34	32	27	34	29	24	34	26	22	34	24	20	34	22	18	28	18	15	24	16	13	21	14	11	18	12	10	16	10	9	14	9	8
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	27	35	29	22	35	25	18	35	22	15	34	19	13	30	17	12
			Exposed	35	35	35	35	35	35	35	35	32	35	35	28	35	32	24	35	29	22	35	27	19	35	22	16	33	19	13	28	17	11	25	14	10	22	13	9	19	11	8
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	32	23	31	28	20	27	24	17	24	22	15
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	28	33	33	25	31	28	20	27	24	17	23	21	14	20	18	12	18	16	10	16	14	9
	C	0-7	Interior	31	31	31	31	31	31	31	31	31	31	31	29	31	31	27	31	31	24	31	31	22	31	26	19	31	23	16	27	19	14	23	17	12	21	15	10	18	13	9
			Exposed	31	31	26	31	31	24	31	30	21	31	27	19	31	24	17	31	22	16	28	20	14	24	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	34	34	34	34	34	32	34	34	29	34	31	26	34	28	23	34	26	21	34	24	19	31	20	16	26	17	14	23	15	12	20	13	10	17	11	9	15	10	8
			Exposed	34	28	23	34	25	21	34	23	19	31	20	17	28	18	15	26	17	14	24	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	31	35	34	27	35	31	24	35	29	21	35	24	17	35	21	14	31	18	12	27	15	10	23	14	9	21	12	8
			Exposed	35	34	27	35	30	23	35	27	20	35	25	18	35	22	15	35	20	14	32	19	13	27	16	11	23	13	9	20	12	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	30	22	29	26	18	25	22	15	22	19	13	19	17	11	17	15	10
			Exposed	33	33	33	33	33	29	33	33	26	33	31	23	31	28	20	28	25	18	26	23	16	22	20	13	19	17	11	16	15	9	14	13	8	12	11	7	11	10	6
	D	0-7	Interior	35	35	34	35	35	30	35	35	27	35	35	24	35	32	22	35	29	20	35	26	18	31	22	16	26	19	13	22	16	11	20	14	10	17	12	9	15	11	8
			Exposed	35	31	22	35	28	20	35	25	18	31	23	16	28	20	14	26	19	13	23	17	12	20	14	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	38	37	30	38	32	27	38	29	24	38	26	22	37	24	19	33	22	18	30	20	16	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7
			Exposed	37	24	19	32	21	17	29	19	16	26	17	14	24	15	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	6	11	7	6	9	6	5	8	5	4
		20-27	Interior	37	37	37	37	37	32	37	35	28	37	32	24	37	29	21	37	26	19	37	24	17	35	20	14	30	17	12	26	15	10	22	13	9	20	11	8	17	10	7
			Exposed	37	29	21	37	25	18	37	23	16	36	21	14	32	19	13	29	17	12	27	15	11	22	13	9	19	11	8	17	10	6	14	8	6	13	7	5	11	6	4
		27-45	Interior	36	36	36	36	36	36	36	36	35	36	36	31	36	36	27	36	33	24	33	30	22	28	25	18	24	22	15	21	19	12	18	16	11	16	14	9	14	13	8
			Exposed	36	36	27	36	32	23	32	29	21	29	26	18	26	23	16	24	21	15	22	19	13	18	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	185	185	185	185	185	185	185	185	185	185	185	185	185	185	100	185	185	74	185	146	62	185	89	52	149	64	45	93	55	39	67	48	34	58	42	30	51	37	26
			Exposed	185	185	99	185	185	69	185	126	60	185	94	54	185	74	49	141	63	44	105	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	68	183	183	60	183	71	55	183	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	183	183	67	183	183	58	183	64	52	183	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	88	173	76	53	173	58	43	113	50	36	80	44	30	66	38	26	58	34	23
			Exposed	173	173	173	173	173	173	173	173	64	173	84	55	173	63	48	173	57	43	154	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	71	164	93	55	164	63	46	61	55	39	54	48	34	48	43	29
			Exposed	164	164	164	164	164	164	164	164	136	164	164	77	164	164	61	164	88	54	164	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	185	185	140	185	185	85	185	164	64	185	114	58	185	88	52	185	70	48	132	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	185	87	52	174	67	46	114	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	183	183	183	183	183	63	183	82	56	183	62	51	183	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	183	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	173	173	173	173	173	173	173	173	173	173	173	60	173	75	53	173	61	47	173	56	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	173	73	53	173	60	45	173	54	39	98	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	164	164	164	164	164	164	164	164	164	164	164	106	164	164	71	164	125	59	164	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	164	164	70	164	108	57	164	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	185	185	70	185	127	60	185	93	54	185	73	48	135	62	44	100	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	133	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	183	183	59	183	64	53	183	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	173	173	173	173	173	64	173	83	55	173	62	48	173	56	42	132	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	173	56	42	114	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	164	164	164	164	164	141	164	164	76	164	143	60	164	84	53	164	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	164	83	53	164	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
10	B	0-7	Interior	135	135	135	135	135	135	135	135	135	135	135	135	135	135	100	135	135	74	135	135	62	135	89	52	135	64	45	93	55	39	67	48	34	58	42	30	51	37	26
			Exposed	135	135	99	135	135	69	135	126	60	135	94	54	135	74	49	135	63	44	105	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	136	136	136	136	136	136	136	136	136	136	136	136	136	136	68	136	136	60	136	71	55	136	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	136	136	67	136	136	58	136	64	52	136	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	88	150	76	53	150	58	43	113	50	36	80	44	30	66	38	26	58	34	23
			Exposed	150	150	150	150	150	150	150	150	64	150	84	55	150	63	48	150	57	43	150	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	71	142	93	55	142	63	46	61	55	39	54	48	34	48	43	29
			Exposed	142	142	142	142	142	142	142	142	136	142	142	77	142	142	61	142	88	54	142	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	135	135	135	135	135	85	135	135	64	135	114	58	135	88	52	135	70	48	132	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	135	87	52	135	67	46	114	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	136	136	136	136	136	63	136	82	56	136	62	51	136	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	136	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	150	150	150	150	150	150	150	150	150	150	150	60	150	75	53	150	61	47	150	56	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	150	73	53	150	60	45	150	54	39	98	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	142	142	142	142	142	142	142	142	142	142	142	106	142	142	71	142	125	59	142	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	142	142	70	142	108	57	142	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	135	135	70	135	127	60	135	93	54	135	73	48	135	62	44	100	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	133	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	136	136	59	136	64	53	136	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	155	155	155	155	155	64	155	83	55	155	62	48	155	56	42	132	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	155	56	42	114	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	146	146	146	146	146	141	146	146	76	146	143	60	146	84	53	146	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	146	83	53	146	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
20	B	0-7	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	74	94	94	62	94	89	52	94	64	45	93	55	39	67	48	34	58	42	30	51	37	26
			Exposed	94	94	94	94	94	69	94	94	60	94	94	54	94	74	49	94	63	44	94	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	68	95	95	60	95	71	55	95	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	95	95	67	95	95	58	95	64	52	95	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	88	116	76	53	116	58	43	113	50	36	80	44	30	66	38	26	58	34	23
			Exposed	116	116	116	116	116	116	116	116	64	116	84	55	116	63	48	116	57	43	116	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	71	111	93	55	111	63	46	61	55	39	54	48	34	48	43	29
			Exposed	111	111	111	111	111	111	111	111	111	111	111	77	111	111	61	111	88	54	111	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	94	94	94	94	94	85	94	94	64	94	94	58	94	88	52	94	70	48	94	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	94	87	52	94	67	46	94	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	95	95	95	95	95	63	95	82	56	95	62	51	95	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	95	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	116	116	116	116	116	116	116	116	116	116	116	60	116	75	53	116	61	47	116	56	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	116	73	53	116	60	45	116	54	39	98	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	111	111	111	111	111	111	111	111	111	111	111	106	111	111	71	111	111	59	111	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	111	111	70	111	108	57	111	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	94	94	70	94	94	60	94	93	54	94	73	48	94	62	44	94	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	94	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	95	95	59	95	64	53	95	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	121	121	121	121	121	64	121	83	55	121	62	48	121	56	42	121	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	121	56	42	114	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	116	116	116	116	116	116	116	116	76	116	116	60	116	84	53	116	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	116	83	53	116	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	74	91	91	62	91	89	52	91	64	45	91	55	39	67	48	34	58	42	30	51	37	26
			Exposed	91	91	91	91	91	69	91	91	60	91	91	54	91	74	49	91	63	44	91	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	95	95	95	95	95	95	95	95	95	95	95	95	95	95	68	95	95	60	95	71	55	95	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	95	95	67	95	95	58	95	64	52	95	57	47	89	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	88	94	76	53	94	58	43	94	50	36	80	44	30	66	38	26	58	34	23
			Exposed	94	94	94	94	94	94	94	94	64	94	84	55	94	63	48	94	57	43	94	52	38	82	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	71	90	90	55	90	63	46	61	55	39	54	48	34	48	43	29
			Exposed	90	90	90	90	90	90	90	90	90	90	90	77	90	90	61	90	88	54	90	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	91	91	91	91	91	85	91	91	64	91	91	58	91	88	52	91	70	48	91	62	43	81	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	91	87	52	91	67	46	91	59	42	86	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	95	95	95	95	95	63	95	82	56	95	62	51	95	56	46	86	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	95	56	46	82	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	94	94	94	94	94	94	94	94	94	94	94	60	94	75	53	94	61	47	94	56	42	91	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	94	73	53	94	60	45	94	54	39	94	48	35	81	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	90	90	90	90	90	90	90	90	90	90	90	90	90	90	71	90	90	59	90	82	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	90	90	70	90	90	57	90	72	50	89	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	94	94	70	94	94	60	94	93	54	94	73	48	94	62	44	94	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	94	62	44	94	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	95	95	59	95	64	53	95	57	47	88	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	100	100	100	100	100	64	100	83	55	100	62	48	100	56	42	100	51	37	90	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	100	56	42	100	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	96	96	96	96	96	96	96	96	76	96	96	60	96	84	53	96	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	96	83	53	96	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
40	B	0-7	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	74	76	76	62	76	76	52	76	64	45	76	55	39	67	48	34	58	42	30	51	37	26
			Exposed	76	76	76	76	76	69	76	76	60	76	76	54	76	74	49	76	63	44	76	57	40	69	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	80	80	80	80	80	80	80	80	80	80	80	80	80	80	68	80	80	60	80	71	55	80	56	46	78	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	80	80	67	80	80	58	80	64	52	80	57	47	80	52	43	77	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	76	53	79	58	43	79	50	36	79	44	30	66	38	26	58	34	23
			Exposed	79	79	79	79	79	79	79	79	64	79	79	55	79	63	48	79	57	43	79	52	38	79	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	71	76	76	55	76	63	46	61	55	39	54	48	34	48	43	29
			Exposed	76	76	76	76	76	76	76	76	76	76	76	76	76	76	61	76	76	54	76	66	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	76	76	76	76	76	76	76	76	64	76	76	58	76	76	52	76	70	48	76	62	43	76	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	76	76	52	76	67	46	76	59	42	76	53	38	68	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	80	80	80	80	80	63	80	80	56	80	62	51	80	56	46	80	51	42	75	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	80	56	46	80	50	41	70	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	79	79	79	79	79	79	79	79	79	79	79	60	79	75	53	79	61	47	79	56	42	79	47	34	72	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	79	73	53	79	60	45	79	54	39	79	48	35	79	44	31	70	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	71	76	76	59	76	76	53	72	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	76	76	70	76	76	57	76	72	50	76	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	81	81	70	81	81	60	81	81	54	81	73	48	81	62	44	81	56	40	80	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	81	62	44	81	55	39	72	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	86	86	59	86	64	53	86	57	47	86	52	42	75	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	75	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	85	85	85	85	85	64	85	83	55	85	62	48	85	56	42	85	51	37	85	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	85	56	42	85	50	36	84	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	81	81	81	81	81	81	81	81	76	81	81	60	81	81	53	81	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	81	81	53	81	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
50	B	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	52	62	62	45	62	55	39	62	48	34	58	42	30	51	37	26			
			Exposed	62	62	62	62	62	62	62	62	60	62	62	54	62	62	49	62	62	44	62	57	40	62	48	34	57	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	60	67	67	55	67	56	46	67	48	39	64	41	34	55	36	30	49	32	26	43	28	23
			Exposed	67	67	67	67	67	58	67	64	52	67	57	47	67	52	43	67	47	39	67	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	53	69	58	43	69	50	36	69	44	30	66	38	26	58	34	23
			Exposed	69	69	69	69	69	69	69	69	64	69	69	55	69	63	48	69	57	43	69	52	38	69	44	31	65	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	55	65	63	46	61	55	39	54	48	34	48	43	29
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	65	65	54	65	65	49	62	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	62	62	62	62	62	62	62	62	62	62	62	58	62	62	52	62	62	48	62	62	43	62	52	37	61	44	31	53	38	27	46	34	24	41	30	21	36	26	19
			Exposed	62	62	52	62	62	46	62	59	42	62	53	38	62	48	34	61	44	31	55	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	67	67	67	67	67	63	67	67	56	67	62	51	67	56	46	67	51	42	67	46	38	60	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	67	56	46	67	50	41	67	44	37	62	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	60	69	69	53	69	61	47	69	56	42	69	47	34	69	41	28	60	35	24	52	31	21	46	27	18	41	24	16
			Exposed	69	69	53	69	60	45	69	54	39	69	48	35	69	44	31	69	40	27	63	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	65	65	53	65	59	43	57	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	65	65	65	65	65	57	65	65	50	65	61	44	61	55	40	56	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	68	68	68	68	68	60	68	68	54	68	68	48	68	62	44	68	56	40	68	52	36	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	68	62	44	68	55	39	68	49	35	61	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	74	74	59	74	64	53	74	57	47	74	52	42	74	47	39	65	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	74	46	38	64	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	74	74	74	74	74	64	74	74	55	74	62	48	74	56	42	74	51	37	74	47	33	70	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	74	56	42	74	50	36	74	45	32	72	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	71	71	71	71	71	71	71	71	71	71	71	60	71	71	53	71	64	48	68	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	71	71	53	71	63	46	63	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	45	52	52	39	52	48	34	52	42	30	51	37	26
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	49	52	52	44	52	52	40	52	48	34	52	41	29	49	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	55	57	56	46	57	48	39	57	41	34	55	36	30	49	32	26	43	28	23
			Exposed	57	57	57	57	57	57	57	57	52	57	57	47	57	52	43	57	47	39	57	43	36	56	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	43	58	50	36	58	44	30	58	38	26	58	34	23
			Exposed	58	58	58	58	58	58	58	58	58	58	58	55	58	58	48	58	57	43	58	52	38	58	44	31	58	38	26	56	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	46	55	55	39	54	48	34	48	43	29
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	55	55	49	55	55	40	53	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	43	52	52	37	52	44	31	52	38	27	46	34	24	41	30	21	36	26	19
			Exposed	52	52	52	52	52	46	52	52	42	52	52	38	52	48	34	52	44	31	52	40	28	47	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	57	57	57	57	57	57	57	57	56	57	57	51	57	56	46	57	51	42	57	46	38	57	39	32	51	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	57	56	46	57	50	41	57	44	37	57	40	33	56	36	30	51	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	53	58	58	47	58	56	42	58	47	34	58	41	28	58	35	24	52	31	21	46	27	18	41	24	16
			Exposed	58	58	53	58	58	45	58	54	39	58	48	35	58	44	31	58	40	27	58	37	25	53	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	55	55	43	55	51	36	49	44	30	43	38	26	38	34	22	34	30	19
			Exposed	55	55	55	55	55	55	55	55	50	55	55	44	55	55	40	55	50	35	51	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	58	58	58	58	58	58	58	58	54	58	58	48	58	58	44	58	56	40	58	52	36	58	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	58	58	44	58	55	39	58	49	35	58	45	31	56	40	29	51	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	62	62	59	62	62	53	62	57	47	62	52	42	62	47	39	62	42	35	60	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	62	46	38	62	41	34	57	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	64	64	64	64	64	64	64	64	55	64	62	48	64	56	42	64	51	37	64	47	33	64	40	27	58	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	64	56	42	64	50	36	64	45	32	64	41	28	63	37	25	57	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	60	61	61	53	61	61	48	61	59	43	56	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	61	61	53	61	61	46	61	56	41	57	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
70	B	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	39	45	45	34	45	42	30	45	37	26
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	40	45	45	34	45	41	29	45	36	25	43	31	22	38	28	19	34	24	17
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	48	39	49	41	34	49	36	30	49	32	26	43	28	23			
			Exposed	49	49	49	49	49	49	49	49	49	49	49	47	49	49	43	49	47	39	49	43	36	49	37	30	48	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	43	50	50	36	50	40	30	50	38	26	50	34	23			
			Exposed	50	50	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	43	50	50	38	50	44	31	50	38	26	50	33	22	49	29	20	43	25	17	38	22	15
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	48	48	39	48	48	34	48	43	29
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	40	48	47	33	46	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	43	45	45	37	45	44	31	45	38	27	45	34	24	41	30	21	36	26	19
			Exposed	45	45	45	45	45	45	45	45	42	45	45	38	45	45	34	45	44	31	45	40	28	45	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	42	49	46	38	49	39	32	49	34	28	44	29	24	39	25	21	34	22	18	30	20	16
			Exposed	49	49	46	49	49	41	49	44	37	49	40	33	49	36	30	49	33	27	46	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	47	50	50	42	50	47	34	50	41	28	50	35	24	50	31	21	46	27	18	41	24	16
			Exposed	50	50	50	50	50	45	50	50	39	50	48	35	50	44	31	50	40	27	50	37	25	50	31	21	45	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	48	48	36	48	44	30	43	38	26	38	34	22	34	30	19
			Exposed	48	48	48	48	48	48	48	48	48	48	48	44	48	48	40	48	48	35	48	46	32	43	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	48	50	50	44	50	50	40	50	50	36	50	44	31	50	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	50	50	44	50	50	39	50	49	35	50	45	31	50	40	29	50	37	26	46	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	54	54	54	54	54	53	54	54	47	54	52	42	54	47	39	54	42	35	54	39	32	50	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	54	46	38	54	41	34	54	37	31	52	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	48	55	55	42	55	51	37	55	47	33	55	40	27	55	34	23	50	29	20	44	26	18	39	23	15	34	20	14
			Exposed	55	55	42	55	50	36	55	45	32	55	41	28	55	37	25	55	34	23	53	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	48	53	53	43	53	50	35	48	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	53	53	53	53	53	46	53	53	41	53	51	36	52	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
80	B	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	34	40	40	30	40	37	26
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	29	40	36	25	40	31	22	38	28	19	34	24	17
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	41	34	43	36	30	43	32	26	43	28	23			
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	37	30	43	31	26	41	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	36	44	44	30	44	44	30	44	38	26	44	34	23
			Exposed	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	38	44	44	31	44	38	26	44	33	22	44	29	20	43	25	17	38	22	15
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	34	42	42	29
			Exposed	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	33	42	41	28	40	36	24	35	32	21	31	28	18
	C	0-7	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	31	40	38	27	40	34	24	40	30	21	36	26	19
			Exposed	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	40	28	40	34	24	40	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	38	43	39	32	43	34	28	43	29	24	39	25	21	34	22	18	30	20	16
			Exposed	43	43	43	43	43	41	43	43	37	43	40	33	43	36	30	43	33	27	43	30	25	39	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	34	44	41	28	44	35	24	44	31	21	44	27	18	39	23	16	34	20	14
			Exposed	44	44	44	44	44	44	44	44	39	44	44	35	44	44	31	44	40	27	44	37	25	44	31	21	44	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	36	42	42	30	42	38	26	38	34	22	34	30	19
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	35	42	42	32	42	39	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	44	44	36	44	44	31	44	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	44	44	44	44	44	39	44	44	35	44	44	31	44	40	29	44	37	26	44	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	48	48	48	48	48	48	48	48	47	48	48	42	48	47	39	48	42	35	48	39	32	48	33	27	43	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	48	46	38	48	41	34	48	37	31	48	34	28	47	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	48	49	49	42	49	49	37	49	47	33	49	40	27	49	34	23	49	29	20	44	26	18	39	23	15	34	20	14
			Exposed	49	49	42	49	49	36	49	45	32	49	41	28	49	37	25	49	34	23	49	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	43	47	47	35	47	43	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	47	47	47	47	47	46	47	47	41	47	47	36	47	46	32	47	42	29	43	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Rafter
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30	35	35	26
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	29	35	35	25	35	31	22	35	28	19	34	24	17
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	36	30	38	32	26	38	28	23
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	37	30	38	31	26	38	27	22	36	24	20	32	21	17	28	18	15
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	30	40	38	26	40	34	23
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	31	40	38	26	40	33	22	40	29	20	40	25	17	38	22	15
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	29
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	28	38	36	24	35	32	21	31	28	18
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	27	35	34	24	35	30	21	35	26	19
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	31	35	35	28	35	34	24	35	29	21	34	25	18	30	22	16	27	19	14	24	17	12
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	32	38	34	28	38	29	24	38	25	21	34	22	18	30	20	16
			Exposed	38	38	38	38	38	38	38	38	37	38	38	33	38	36	30	38	33	27	38	30	25	38	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	40	40	28	40	35	24	40	31	21	40	27	18	40	24	16
			Exposed	40	40	40	40	40	40	40	40	39	40	40	35	40	40	31	40	40	27	40	37	25	40	31	21	40	27	18	39	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	30	38	38	26	38	34	22	34	30	19			
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	38	26	37	33	22	32	29	18	28	25	16	25	22	14	22	20	12			
	D	0-7	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	36	39	39	31	39	37	26	39	32	23	39	28	20	34	25	18	30	22	16			
			Exposed	39	39	39	39	39	39	39	39	35	39	39	31	39	39	29	39	37	26	39	34	24	39	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	35	42	39	32	42	33	27	42	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	42	42	38	42	41	34	42	37	31	42	34	28	42	30	25	42	28	23	39	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	37	44	44	33	44	40	27	44	34	23	44	29	20	44	26	18	39	23	15	34	20	14
			Exposed	44	44	42	44	44	36	44	44	32	44	41	28	44	37	25	44	34	23	44	31	21	44	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	35	42	42	29	41	37	25	36	32	21	32	28	18	28	25	16
			Exposed	42	42	42	42	42	42	42	42	41	42	42	36	42	42	32	42	42	29	42	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10
100	B	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	26
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	29	32	32	25	32	31	22	32	28	19	32	24	17
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30	35	32	26	35	28	23
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	35	31	26	35	27	22	35	24	20	32	21	17	28	18	15
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	30	36	36	26	36	34	23
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	36	26	36	33	22	36	29	20	36	25	17	36	22	15
		27-45	Interior	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	34	34	34	34	34	34	34	34	34	29
			Exposed	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	24	34	32	21	31	28	18			
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	27	32	32	24	32	30	21	32	26	19
			Exposed	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	32	24	32	29	21	32	25	18	30	22	16	27	19	14	24	17	12			
		7-20	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	34	28	35	29	24	35	25	21	34	22	18	30	20	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	33	35	35	30	35	33	27	35	30	25	35	26	21	34	22	18	29	19	16	25	17	14	22	15	12	20	13	11
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	36	36	28	36	35	24	36	31	21	36	27	18	36	24	16
			Exposed	36	36	36	36	36	36	36	36	36	36	36	35	36	36	31	36	36	27	36	36	25	36	31	21	36	27	18	36	23	16	34	20	14	30	18	12	27	16	11
		27-45	Interior	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	30	34	34	26	34	34	22	34	30	19			
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	26	34	33	22	32	29	18	28	25	16	25	22	14	22	20	12
	D	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	26	35	32	23	35	28	20	34	25	18	30	22	16			
			Exposed	35	35	35	35	35	35	35	35	35	35	35	31	35	35	29	35	35	26	35	34	24	35	28	20	33	24	17	29	21	15	25	18	13	22	16	11	20	14	10
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	32	38	33	27	38	28	23	37	24	20	33	21	18	29	19	15	25	17	14
			Exposed	38	38	38	38	38	34	38	37	31	38	34	28	38	30	25	38	28	23	38	25	21	33	21	18	28	18	15	24	16	13	21	14	11	19	12	10	17	11	9
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	40	27	40	34	23	40	29	20	40	26	18	39	23	15	34	20	14
			Exposed	40	40	40	40	40	36	40	40	32	40	40	28	40	37	25	40	34	23	40	31	21	40	26	18	38	22	15	33	19	13	29	17	11	25	15	10	22	13	9
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	29	38	37	25	36	32	21	32	28	18	28	25	16
			Exposed	38	38	38	38	38	38	38	38	38	38	38	36	38	38	32	38	38	29	38	38	26	36	33	21	31	28	18	27	24	15	24	21	13	21	19	11	18	17	10

Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

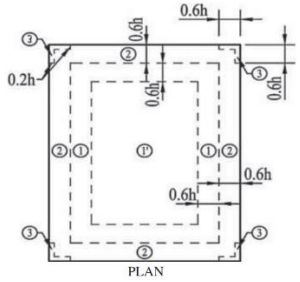
Seismic Design Assumptions

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

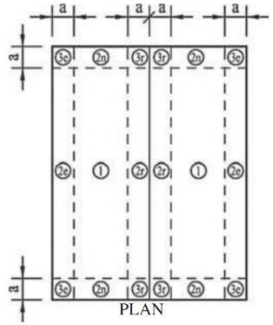
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

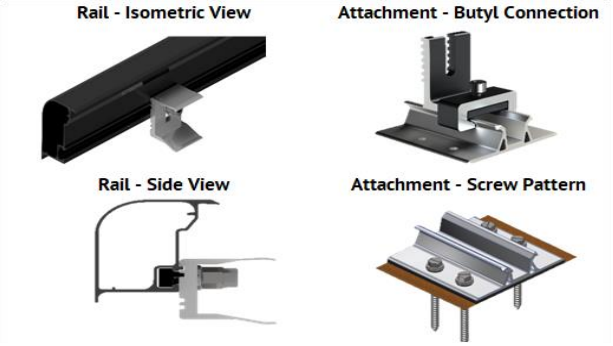
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Trim Rail - DtD OSB

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	11	10	7	10	9	6
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	8	6	11	7	5	11	6	4	10	6	4
		27-45	Interior	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	10	12	12	9	11	11	8	11	11	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	7	12	11	6	10	9	6	9	8	5	8	7	4
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	6	5	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	6	5	8	5	4	7	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	11	10	7	10	9	6	10	8	5	10	7	5	9	6	4
			Exposed	11	11	11	11	11	11	11	11	9	11	11	8	11	11	8	11	10	7	11	9	6	11	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	11	11	7	10	10	6	10	9	5	9	8	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	8	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	7	5	8	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	8	6	5	8	5	4	7	5	4	6	4	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	11	9	6	11	7	5	10	6	4	10	6	4	9	5	3
			Exposed	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	12	12	8	11	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	13	13	12	13	13	10	13	13	9	13	13	8	13	12	7	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
70	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	9	6	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	9	6	9	8	5	8	7	4
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	9	5	3	8	4	3	7	4	2	7	4	2	6	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	10	10	6	9	9	5	9	8	5	8	7	5
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	10	6	10	9	5	8	7	4	7	6	4	6	6	3	6	5	3	5	4	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	10	7	10	9	6	9	7	5	9	6	4	9	6	4	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	9	6	10	8	5	10	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	11	7	10	9	6	9	8	5	8	7	4	7	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	8	6	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	9	6	9	8	5	8	7	4
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	8	4	3	7	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	8	8	5	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	4	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	6	5	4	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	8	6	4	8	6	4	8	5	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	6	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	7	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	7	6	4	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	6	4
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	5	3	7	4	3	6	4	2	6	4	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3	5	5	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	3	2	4	3	2	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3	6	4	2
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	4	2
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	48	48	48	48	48	46	48	48	41	48	48	37	48	48	33	48	43	30	48	39	27	46	33	23	39	28	20	34	24	17	29	21	15	26	19	13	23	16	12
			Exposed	48	48	33	48	42	29	48	38	26	47	34	24	43	31	21	39	28	19	35	25	18	30	21	15	25	18	13	22	16	11	19	14	10	17	12	8	15	11	7
		7-20	Interior	48	48	45	48	48	40	48	44	36	48	39	32	48	36	29	48	32	26	46	29	24	38	25	20	33	21	17	28	18	15	24	16	13	21	14	11	19	12	10
			Exposed	48	35	29	48	31	26	44	28	23	39	25	21	36	23	19	32	21	17	29	19	16	25	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7
		20-27	Interior	49	49	49	49	49	44	49	49	38	49	48	33	49	43	29	49	39	26	49	36	24	49	30	20	45	26	17	38	22	15	33	19	13	29	17	11	26	15	10
			Exposed	49	43	29	49	38	26	49	34	23	49	31	21	49	28	19	44	25	17	40	23	16	34	19	13	29	17	11	25	14	10	21	12	8	19	11	7	17	10	7
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	43	49	49	38	49	49	34	49	45	30	42	38	25	36	32	21	31	28	17	27	24	15	24	21	13	21	19	11
			Exposed	49	49	38	49	48	33	48	43	29	43	38	25	39	35	23	35	32	20	32	29	18	27	24	15	23	21	13	20	18	11	18	16	10	15	14	8	14	12	7
	C	0-7	Interior	48	48	36	48	46	32	48	41	28	48	36	25	46	33	23	42	30	21	38	27	19	32	23	16	27	20	14	23	17	12	20	15	10	18	13	9	16	11	8
			Exposed	46	33	23	41	29	20	36	26	18	33	23	16	29	21	15	27	19	14	24	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	5
		7-20	Interior	48	38	31	48	34	28	47	30	25	42	27	22	38	25	20	35	22	18	32	20	17	27	17	14	23	15	12	20	13	10	17	11	9	15	10	8	13	9	7
			Exposed	38	25	20	34	22	18	30	20	16	27	18	14	25	16	13	22	15	12	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5	9	6	4
		20-27	Interior	49	46	32	49	41	28	49	37	25	49	33	22	49	30	20	47	27	18	43	25	17	36	21	14	31	18	12	27	15	10	23	13	9	20	12	8	18	10	7
			Exposed	49	30	20	46	26	18	41	24	16	37	21	14	33	19	13	30	18	12	28	16	11	23	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4
		27-45	Interior	49	49	41	49	49	36	49	46	31	46	41	28	42	37	25	38	34	22	35	31	20	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9	15	13	8
			Exposed	42	37	25	37	33	21	33	30	19	30	27	17	27	24	15	25	22	13	23	20	12	19	17	10	16	15	9	14	13	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	48	43	30	48	38	26	47	34	24	42	30	21	38	27	19	35	25	17	32	23	16	27	19	13	23	16	11	19	14	10	17	12	9	15	11	8	13	10	7
			Exposed	38	27	19	34	24	17	30	22	15	27	20	14	25	18	12	22	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	48	32	26	44	28	23	39	25	21	35	23	19	32	21	17	29	19	15	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7	11	7	6
			Exposed	32	20	17	28	18	15	25	16	13	23	15	12	21	13	11	19	12	10	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	49	38	26	49	34	23	49	31	21	48	28	19	43	25	17	39	23	15	36	21	14	30	17	12	26	15	10	22	13	9	19	11	8	17	10	7	15	9	6
			Exposed	43	25	17	38	22	15	34	20	13	31	18	12	28	16	11	25	15	10	23	13	9	20	11	8	17	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	49	48	33	48	43	29	43	38	25	39	35	22	35	31	20	32	28	18	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	12	8	12	11	7
			Exposed	35	31	20	31	28	17	28	25	15	25	22	14	23	20	12	21	18	11	19	17	10	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
10	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	33	23	33	28	20	33	24	17	29	21	15	26	19	13	23	16	12
			Exposed	33	33	33	33	33	29	33	33	26	33	33	24	33	31	21	33	28	19	33	25	18	30	21	15	25	18	13	22	16	11	19	14	10	17	12	8	15	11	7
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	32	34	34	29	34	32	26	34	29	24	34	25	20	33	21	17	28	18	15	24	16	13	21	14	11	19	12	10
			Exposed	34	34	29	34	31	26	34	28	23	34	25	21	34	23	19	32	21	17	29	19	16	25	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7
		20-27	Interior	44	44	44	44	44	44	44	44	38	44	44	33	44	43	29	44	39	26	44	36	24	44	30	20	44	26	17	38	22	15	33	19	13	29	17	11	26	15	10
			Exposed	44	43	29	44	38	26	44	34	23	44	31	21	44	28	19	44	25	17	40	23	16	34	19	13	29	17	11	25	14	10	21	12	8	19	11	7	17	10	7
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	43	48	48	38	48	48	34	48	45	30	42	38	25	36	32	21	31	28	17	27	24	15	24	21	13	21	19	11
			Exposed	48	48	38	48	48	33	48	43	29	43	38	25	39	35	23	35	32	20	32	29	18	27	24	15	23	21	13	20	18	11	18	16	10	15	14	8	14	12	7
	C	0-7	Interior	33	33	33	33	33	32	33	33	28	33	33	25	33	33	23	33	30	21	33	27	19	32	23	16	27	20	14	23	17	12	20	15	10	18	13	9	16	11	8
			Exposed	33	33	23	33	29	20	33	26	18	33	23	16	29	21	15	27	19	14	24	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	5
		7-20	Interior	34	34	31	34	34	28	34	30	25	34	27	22	34	25	20	34	22	18	32	20	17	27	17	14	23	15	12	20	13	10	17	11	9	15	10	8	13	9	7
			Exposed	34	25	20	34	22	18	30	20	16	27	18	14	25	16	13	22	15	12	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5	9	6	4
		20-27	Interior	44	44	32	44	41	28	44	37	25	44	33	22	44	30	20	44	27	18	43	25	17	36	21	14	31	18	12	27	15	10	23	13	9	20	12	8	18	10	7
			Exposed	44	30	20	44	26	18	41	24	16	37	21	14	33	19	13	30	18	12	28	16	11	23	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4
		27-45	Interior	48	48	41	48	48	36	48	46	31	46	41	28	42	37	25	38	34	22	35	31	20	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9	15	13	8
			Exposed	42	37	25	37	33	21	33	30	19	30	27	17	27	24	15	25	22	13	23	20	12	19	17	10	16	15	9	14	13	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	33	33	30	33	33	26	33	33	24	33	30	21	33	27	19	33	25	17	32	23	16	27	19	13	23	16	11	19	14	10	17	12	9	15	11	8	13	10	7
			Exposed	33	27	19	33	24	17	30	22	15	27	20	14	25	18	12	22	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	34	32	26	34	28	23	34	25	21	34	23	19	32	21	17	29	19	15	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7	11	7	6
			Exposed	32	20	17	28	18	15	25	16	13	23	15	12	21	13	11	19	12	10	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	46	38	26	46	34	23	46	31	21	46	28	19	43	25	17	39	23	15	36	21	14	30	17	12	26	15	10	22	13	9	19	11	8	17	10	7	15	9	6
			Exposed	43	25	17	38	22	15	34	20	13	31	18	12	28	16	11	25	15	10	23	13	9	20	11	8	17	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	49	48	33	48	43	29	43	38	25	39	35	22	35	31	20	32	28	18	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	12	8	12	11	7
			Exposed	35	31	20	31	28	17	28	25	15	25	22	14	23	20	12	21	18	11	19	17	10	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
20	B	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17	23	21	15	23	19	13	23	16	12
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	18	23	21	15	23	18	13	22	16	11	19	14	10	17	12	8	15	11	7
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	21	17	23	18	15	23	16	13	21	14	11	19	12	10	19	12	10
			Exposed	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	21	17	23	19	16	23	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	35	26	35	35	24	35	30	20	35	26	17	35	22	15	33	19	13	29	17	11	26	15	10
			Exposed	35	35	29	35	35	26	35	34	23	35	31	21	35	28	19	35	25	17	35	23	16	34	19	13	29	17	11	25	14	10	21	12	8	19	11	7	17	10	7
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	34	39	39	30	39	38	25	36	32	21	31	28	17	27	24	15	24	21	13	21	19	11
			Exposed	39	39	38	39	39	33	39	39	29	39	38	25	39	35	23	35	32	20	32	29	18	27	24	15	23	21	13	20	18	11	18	16	10	15	14	8	14	12	7
	C	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	16	23	20	14	23	17	12	20	15	10	18	13	9	16	11	8
			Exposed	23	23	23	23	23	20	23	23	18	23	23	16	23	21	15	23	19	14	23	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	5
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	22	18	23	20	17	23	17	14	23	15	12	20	13	10	17	11	9	15	10	8	13	9	7
			Exposed	23	23	20	23	22	18	23	20	16	23	18	14	23	16	13	22	15	12	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5	9	6	4
		20-27	Interior	35	35	32	35	35	28	35	35	25	35	33	22	35	30	20	35	27	18	35	25	17	35	21	14	31	18	12	27	15	10	23	13	9	20	12	8	18	10	7
			Exposed	35	30	20	35	26	18	35	24	16	35	21	14	33	19	13	30	18	12	28	16	11	23	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4
		27-45	Interior	39	39	39	39	39	36	39	39	31	39	39	28	39	37	25	38	34	22	35	31	20	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9	15	13	8
			Exposed	39	37	25	37	33	21	33	30	19	30	27	17	27	24	15	25	22	13	23	20	12	19	17	10	16	15	9	14	13	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	17	23	23	16	23	19	13	23	16	11	19	14	10	17	12	9	15	11	8	13	10	7
			Exposed	23	23	19	23	23	17	23	22	15	23	20	14	23	18	12	22	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	23	23	23	23	23	23	23	23	21	23	23	19	23	21	17	23	19	15	23	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7	11	7	6
			Exposed	23	20	17	23	18	15	23	16	13	23	15	12	21	13	11	19	12	10	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	36	36	26	36	34	23	36	31	21	36	28	19	36	25	17	36	23	15	36	21	14	30	17	12	26	15	10	22	13	9	19	11	8	17	10	7	15	9	6
			Exposed	36	25	17	36	22	15	34	20	13	31	18	12	28	16	11	25	15	10	23	13	9	20	11	8	17	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	40	40	33	40	40	29	40	38	25	39	35	22	35	31	20	32	28	18	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	12	8	12	11	7
			Exposed	35	31	20	31	28	17	28	25	15	25	22	14	23	20	12	21	18	11	19	17	10	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	8	7
		20-27	Interior	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	11	13	13	10	13	10	7
			Exposed	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	11	13	13	10	13	12	8	13	11	7	13	10	7
		27-45	Interior	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	14	14	11
			Exposed	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	11	14	14	10	14	14	8	14	12	7
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	9	6	4
		20-27	Interior	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	13	13	10	13	13	9	12	12	8	12	10	7
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	12	8	13	10	7	13	9	6	12	8	5	12	7	4	12	9	6
		27-45	Interior	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	10	14	14	10	13	13	9	13	13	8	13	13	9
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	14	9	14	13	8	12	11	7	11	10	6	10	9	5	11	10	6
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	6	9	7	5	9	6	4
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	14	13	9	13	11	8	13	10	7	12	9	6
			Exposed	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	13	9	14	11	8	14	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	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	11	15	15	10	14	14	9	13	12	8	12	11	7
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
100	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	7
		20-27	Interior	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	11	11	11	10
			Exposed	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	10	11	11	8	11	11	7	11	10	7	11	10	7
		27-45	Interior	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	12	12	12	11
			Exposed	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	11	12	12	10	12	12	8	12	12	7
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	6	4
		20-27	Interior	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	10	11	11	9	11	11	8	11	11	7	11	10	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	11	8	5	11	7	4	11	8	5
		27-45	Interior	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	10	12	12	9	12	12	9	12	12	8	12	12	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4	7	5	4	7	5	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	12	11	8	12	10	7	11	9	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	11	8	13	10	7	13	8	6	12	7	5	11	6	4	10	6	4
		27-45	Interior	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	11	14	14	10	13	13	9	13	12	8	12	11	7
			Exposed	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4	8	7	4

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	11	11	8	11	10	7	11	9	6	11	8	6
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	10	11	11	9	11	10	7	11	9	6	11	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	9	7	11	8	6	11	7	5	9	6	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	8	11	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	13	8	14	11	7	14	9	6	14	8	5	13	7	5
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	14	12	8	14	11	8	14	9	6	14	8	5	12	7	5	11	6	4	9	5	3	8	5	3
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	12	16	16	10	15	14	8	13	12	7	12	10	6	10	9	5
			Exposed	16	16	16	16	16	16	16	16	14	16	16	13	16	16	11	16	16	10	16	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	7	11	9	6	10	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	8	7	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3
			Exposed	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	14	9	6	14	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	16	16	12	16	16	11	16	15	9	15	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	9	11	11	8	11	9	6	11	8	6	10	7	5	8	6	4	7	5	4	6	5	3
			Exposed	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	11	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	15	15	13	15	15	11	15	15	10	15	14	9	15	12	8	15	11	7	15	10	7	15	8	6	13	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	15	12	8	15	11	7	15	10	6	15	9	6	14	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	14	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	17	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
40	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	6	9	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8	6	9	7	5	9	6	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	8	10	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	12	9	6	12	8	5	11	7	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	8	12	9	6	12	8	5	12	7	5	11	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	13	13	8	12	12	7	12	10	6	10	9	5
			Exposed	14	14	14	14	14	14	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7	9	7	6	9	6	5	8	5	4	7	5	4	6	4	3
			Exposed	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	11	7	5	11	6	4	10	6	4	9	5	3
			Exposed	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	13	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	14	14	12	14	14	11	14	14	9	14	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	9	10	10	8	10	9	6	10	8	6	10	7	5	8	6	4	7	5	4	6	5	3
			Exposed	10	10	9	10	10	8	10	10	7	10	10	7	10	9	6	10	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	7	10	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	13	13	13	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	10	7	13	8	6	12	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	13	12	8	13	11	7	13	10	6	13	9	6	13	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	15	15	15	15	15	14	15	15	12	15	15	11	14	14	10	14	14	9	13	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	15	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
50	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	10	9	6	10	8	5	10	7	5	10	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	6	10	8	5	10	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	12	12	8	11	11	7	10	10	6	10	9	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3	6	4	2
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	5	4	6	4	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	9	6	4	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	9	6	10	8	5	10	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	11	11	7	11	10	6	10	9	5	8	7	4	7	7	4	7	6	4
			Exposed	12	12	12	12	12	11	12	12	9	12	12	8	12	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	6	8	7	5	8	6	4	7	5	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	2
		20-27	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	8	6	10	7	5	10	6	4	9	5	4	8	5	3	7	4	3
			Exposed	11	11	8	11	11	7	11	10	6	11	9	6	11	8	5	11	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	12	12	9	12	12	8	11	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	13	13	10	13	13	8	13	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	7	5	4	7	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	6	9	8	5	9	7	5	9	6	4	9	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	9	9	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	9	5	9	8	5	7	7	4
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	6	5	4	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	8	6	4	8	6	4	8	5	3
			Exposed	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	4	6	4	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	7	5	7	6	4	6	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	8	6	9	7	5	9	6	4	8	5	4	8	5	3	7	4	3
			Exposed	10	10	8	10	10	7	10	10	6	10	9	6	10	8	5	10	7	5	10	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	10	10	6	10	9	5	9	8	5	8	7	4	7	6	4
			Exposed	11	11	10	11	11	8	11	11	7	11	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	5	7	7	4
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	5	4	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	7	6	4	7	6	4	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	5	8	7	4	8	6	4	8	5	3	7	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3	5	3	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	8	6	8	7	5	8	6	4	8	5	4	7	5	3
			Exposed	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	5	9	6	4	8	5	3	7	4	3	6	4	2	5	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	9	5	8	8	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	5	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	4	7	6	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	2	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	6	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	4	5	4	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	4	3	5	3	3	5	3	2	4	3	2	4	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	8	6	8	8	4	7	5	3	6	4	2	6	3	2	5	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	8	5	8	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	5	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2	6	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4	6	4	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3	5	4	2	4	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	5	4	6	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4	6	5	3	5	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3	5	5	3
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2	5	3	2	4	3	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	5	5	3	5	4	2	4	4	2
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4	6	5	3	5	4	3	4	4	2	4	3	2	4	3	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	6	3	2	5	3	2	5	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4	6	6	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	47	47	47	47	47	45	47	47	40	47	47	36	47	47	33	47	42	30	47	39	27	45	32	23	38	28	19	33	24	17	29	21	14	25	18	13	22	16	11
			Exposed	47	47	32	47	41	29	47	37	26	46	33	23	42	30	21	38	27	19	34	25	17	29	21	15	25	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	47	47	44	47	47	39	47	43	35	47	38	32	47	35	28	47	32	26	45	29	24	38	24	20	32	21	17	28	18	15	24	15	13	21	14	11	19	12	10
			Exposed	47	35	28	47	31	25	43	28	23	38	25	20	35	22	18	32	20	17	29	19	15	24	16	13	21	13	11	18	12	9	15	10	8	14	9	7	12	8	6
		20-27	Interior	47	47	47	47	47	43	47	47	37	47	47	33	47	42	29	47	38	26	47	35	24	47	29	20	44	25	17	37	22	15	33	19	13	29	17	11	25	15	10
			Exposed	47	42	28	47	37	25	47	33	23	47	30	20	47	27	18	43	25	17	39	23	15	33	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	42	48	48	37	48	48	33	48	44	30	41	37	24	35	31	20	30	27	17	26	24	14	23	21	13	21	18	11
			Exposed	48	48	37	48	47	32	47	42	28	42	38	25	38	34	22	35	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	13	8	13	12	7
	C	0-7	Interior	47	47	35	47	45	31	47	40	28	47	36	25	45	32	23	41	29	20	37	27	19	31	22	16	26	19	13	23	16	12	20	14	10	17	13	9	15	11	8
			Exposed	45	32	22	40	29	20	35	26	18	32	23	16	29	21	15	26	19	13	24	17	12	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	47	37	31	47	33	27	46	30	24	41	27	22	37	24	20	34	22	18	31	20	16	26	17	14	22	14	12	19	12	10	17	11	9	15	9	8	13	8	7
			Exposed	37	24	20	33	21	18	30	19	16	27	17	14	24	16	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4
		20-27	Interior	47	45	31	47	40	27	47	36	24	47	32	22	47	29	20	46	27	18	42	24	16	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8	18	10	7
			Exposed	47	29	20	45	26	18	40	23	16	36	21	14	33	19	13	30	17	12	27	16	11	23	13	9	19	11	8	17	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	48	48	40	48	48	35	48	45	31	45	40	27	41	37	24	37	33	22	34	30	19	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	13	8
			Exposed	41	36	24	36	32	21	33	29	18	29	26	16	27	24	15	24	22	13	22	20	12	19	17	10	16	14	9	14	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	47	42	29	47	37	26	46	33	23	41	30	21	37	27	19	34	24	17	31	22	16	26	19	13	22	16	11	19	14	10	17	12	8	15	11	7	13	9	7
			Exposed	37	27	19	33	24	17	30	21	15	27	19	13	24	17	12	22	16	11	20	14	10	17	12	8	14	10	7	12	9	6	11	8	5	9	7	5	8	6	4
		7-20	Interior	47	31	25	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	26	17	14	22	14	12	19	12	10	16	10	9	14	9	7	12	8	6	11	7	6
			Exposed	31	20	16	28	18	15	25	16	13	22	14	12	20	13	11	18	12	10	17	11	9	14	9	7	12	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	47	38	25	47	33	23	47	30	20	47	27	18	42	24	16	39	22	15	35	20	14	29	17	12	25	15	10	22	13	8	19	11	7	17	10	6	15	8	6
			Exposed	42	24	16	38	22	15	34	19	13	30	17	12	27	16	11	25	14	10	23	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	48	47	32	47	42	28	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	24	21	13	20	18	11	18	16	10	15	14	8	14	12	7	12	11	6
			Exposed	34	30	19	30	27	17	27	24	15	25	22	13	22	20	12	20	18	11	18	17	10	16	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
10	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	32	23	33	28	19	33	24	17	29	21	14	25	18	13	22	16	11
			Exposed	33	33	32	33	33	29	33	33	26	33	33	23	33	30	21	33	27	19	33	25	17	29	21	15	25	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	32	33	33	28	33	32	26	33	29	24	33	24	20	32	21	17	28	18	15	24	15	13	21	14	11	19	12	10
			Exposed	33	33	28	33	31	25	33	28	23	33	25	20	33	22	18	32	20	17	29	19	15	24	16	13	21	13	11	18	12	9	15	10	8	14	9	7	12	8	6
		20-27	Interior	43	43	43	43	43	43	43	43	37	43	43	33	43	42	29	43	38	26	43	35	24	43	29	20	43	25	17	37	22	15	33	19	13	29	17	11	25	15	10
			Exposed	43	42	28	43	37	25	43	33	23	43	30	20	43	27	18	43	25	17	39	23	15	33	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	42	47	47	37	47	47	33	47	44	30	41	37	24	35	31	20	30	27	17	26	24	14	23	21	13	21	18	11
			Exposed	47	47	37	47	47	32	47	42	28	42	38	25	38	34	22	35	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	13	8	13	12	7
	C	0-7	Interior	33	33	33	33	33	31	33	33	28	33	33	25	33	32	23	33	29	20	33	27	19	31	22	16	26	19	13	23	16	12	20	14	10	17	13	9	15	11	8
			Exposed	33	32	22	33	29	20	33	26	18	32	23	16	29	21	15	26	19	13	24	17	12	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	33	33	31	33	33	27	33	30	24	33	27	22	33	24	20	33	22	18	31	20	16	26	17	14	22	14	12	19	12	10	17	11	9	15	9	8	13	8	7
			Exposed	33	24	20	33	21	18	30	19	16	27	17	14	24	16	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4
		20-27	Interior	43	43	31	43	40	27	43	36	24	43	32	22	43	29	20	43	27	18	42	24	16	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8	18	10	7
			Exposed	43	29	20	43	26	18	40	23	16	36	21	14	33	19	13	30	17	12	27	16	11	23	13	9	19	11	8	17	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	47	47	40	47	47	35	47	45	31	45	40	27	41	37	24	37	33	22	34	30	19	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	13	8
			Exposed	41	36	24	36	32	21	33	29	18	29	26	16	27	24	15	24	22	13	22	20	12	19	17	10	16	14	9	14	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	33	33	29	33	33	26	33	33	23	33	30	21	33	27	19	33	24	17	31	22	16	26	19	13	22	16	11	19	14	10	17	12	8	15	11	7	13	9	7
			Exposed	33	27	19	33	24	17	30	21	15	27	19	13	24	17	12	22	16	11	20	14	10	17	12	8	14	10	7	12	9	6	11	8	5	9	7	5	8	6	4
		7-20	Interior	33	31	25	33	28	23	33	25	20	33	22	18	31	20	17	28	18	15	26	17	14	22	14	12	19	12	10	16	10	9	14	9	7	12	8	6	11	7	6
			Exposed	31	20	16	28	18	15	25	16	13	22	14	12	20	13	11	18	12	10	17	11	9	14	9	7	12	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	44	38	25	44	33	23	44	30	20	44	27	18	42	24	16	39	22	15	35	20	14	29	17	12	25	15	10	22	13	8	19	11	7	17	10	6	15	8	6
			Exposed	42	24	16	38	22	15	34	19	13	30	17	12	27	16	11	25	14	10	23	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	48	47	32	47	42	28	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	24	21	13	20	18	11	18	16	10	15	14	8	14	12	7	12	11	6
			Exposed	34	30	19	30	27	17	27	24	15	25	22	13	22	20	12	20	18	11	18	17	10	16	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
20	B	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	19	23	23	17	23	21	14	23	18	13	22	16	11
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	17	23	21	15	23	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	21	17	23	18	15	23	15	13	21	14	11	19	12	10
			Exposed	23	23	23	23	23	23	23	23	23	23	23	20	23	22	18	23	20	17	23	19	15	23	16	13	21	13	11	18	12	9	15	10	8	14	9	7	12	8	6
		20-27	Interior	34	34	34	34	34	34	34	34	34	34	34	33	34	34	29	34	34	26	34	34	24	34	29	20	34	25	17	34	22	15	33	19	13	29	17	11	25	15	10
			Exposed	34	34	28	34	34	25	34	33	23	34	30	20	34	27	18	34	25	17	34	23	15	33	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	33	38	38	30	38	37	24	35	31	20	30	27	17	26	24	14	23	21	13	21	18	11
			Exposed	38	38	37	38	38	32	38	38	28	38	38	25	38	34	22	35	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	13	8	13	12	7
	C	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	19	23	22	16	23	19	13	23	16	12	20	14	10	17	13	9	15	11	8
			Exposed	23	23	22	23	23	20	23	23	18	23	23	16	23	21	15	23	19	13	23	17	12	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	22	18	23	20	16	23	17	14	22	14	12	19	12	10	17	11	9	15	9	8	13	8	7
			Exposed	23	23	20	23	21	18	23	19	16	23	17	14	23	16	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4
		20-27	Interior	34	34	31	34	34	27	34	34	24	34	32	22	34	29	20	34	27	18	34	24	16	34	20	14	30	17	12	26	15	10	23	13	9	20	12	8	18	10	7
			Exposed	34	29	20	34	26	18	34	23	16	34	21	14	33	19	13	30	17	12	27	16	11	23	13	9	19	11	8	17	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	38	38	38	38	38	35	38	38	31	38	38	27	38	37	24	37	33	22	34	30	19	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	13	8
			Exposed	38	36	24	36	32	21	33	29	18	29	26	16	27	24	15	24	22	13	22	20	12	19	17	10	16	14	9	14	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	19	23	23	19	23	23	17	23	22	16	23	19	13	22	16	11	19	14	10	17	12	8	15	11	7	13	9	7
			Exposed	23	23	19	23	23	17	23	21	15	23	19	13	23	17	12	22	16	11	20	14	10	17	12	8	14	10	7	12	9	6	11	8	5	9	7	5	8	6	4
		7-20	Interior	23	23	23	23	23	23	23	23	20	23	22	18	23	20	17	23	18	15	23	17	14	22	14	12	19	12	10	16	10	9	14	9	7	12	8	6	11	7	6
			Exposed	23	20	16	23	18	15	23	16	13	22	14	12	20	13	11	18	12	10	17	11	9	14	9	7	12	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	35	35	25	35	33	23	35	30	20	35	27	18	35	24	16	35	22	15	35	20	14	29	17	12	25	15	10	22	13	8	19	11	7	17	10	6	15	8	6
			Exposed	35	24	16	35	22	15	34	19	13	30	17	12	27	16	11	25	14	10	23	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	39	39	32	39	39	28	39	38	25	38	34	22	34	31	20	31	28	18	28	25	16	24	21	13	20	18	11	18	16	10	15	14	8	14	12	7	12	11	6
			Exposed	34	30	19	30	27	17	27	24	15	25	22	13	22	20	12	20	18	11	18	17	10	16	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	8	6
		20-27	Interior	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	11	12	12	10	12	12	10
			Exposed	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	11	12	12	9	12	12	8	12	11	7	12	9	6
		27-45	Interior	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	11
			Exposed	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	13	13	11	13	13	9	13	13	8	13	12	7
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4	4
		20-27	Interior	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	10	12	12	9	12	12	8	12	10	7	12	9	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	8	6	12	7	5	11	7	4
		27-45	Interior	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	11	13	13	10	13	13	9	13	13	8	13	10	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	13	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	7	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	7	10	8	6	10	7	6	10	7	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	7	10	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	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	10	13	13	8	13	11	7	12	10	6	12	8	6
			Exposed	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	13	9	14	11	7	14	9	6	13	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	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	11	14	14	10	14	14	8	13	12	7	12	11	6
			Exposed	15	15	15	15	15	15	15	15	15	15	15	13	15	15	12	15	15	11	15	15	10	15	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
100	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	6
		20-27	Interior	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	10	11	11	10
			Exposed	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	9	11	11	8	11	11	7	11	9	6	11	9	6
		27-45	Interior	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	12	12	12	11
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	12	8	12	12	7	12	12	7
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	11	11	7	11	10	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	11	7	5	11	7	4
		27-45	Interior	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	11	12	12	9	12	12	9	12	12	8	12	12	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	8	6	9	7	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	6	9	7	5	9	6	5	8	5	4	7	4	4	6	5	4
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	11	10	6	11	8	6	10	7	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	11	7	12	9	6	12	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	10	13	13	8	12	12	7	12	11	6	11	9	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	13	13	10	13	12	9	13	11	8	13	10	7
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	10	13	13	9	13	11	7	13	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	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	12	10	14	11	9	14	9	8	13	8	7	11	7	6
			Exposed	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	12	10	14	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	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	15	10	17	13	9	17	11	8	17	10	7	15	9	6
			Exposed	17	17	17	17	17	15	17	17	14	17	17	12	17	16	11	17	15	10	17	14	9	17	11	8	17	10	7	15	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	15	19	19	12	18	16	10	16	14	9	14	12	8	12	11	7
			Exposed	19	19	19	19	19	19	19	19	17	19	19	15	19	19	13	19	19	12	19	17	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
	C	0-7	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	12	8	13	10	7	12	9	6	10	8	5	9	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	11	8	13	10	7	12	9	6	10	7	5	9	6	4	8	5	4	7	5	3	6	4	3
		7-20	Interior	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	13	11	14	12	10	14	10	8	13	9	7	12	7	6	10	6	5	9	6	5	8	5	4
			Exposed	14	14	12	14	13	11	14	12	9	14	10	8	14	9	8	13	8	7	12	8	6	10	6	5	9	5	4	7	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	17	17	17	17	17	16	17	17	15	17	17	13	17	17	12	17	16	11	17	15	10	17	12	8	17	10	7	16	9	6	14	8	5	12	7	5	11	6	4
			Exposed	17	17	12	17	16	11	17	14	9	17	13	8	17	11	8	17	10	7	16	9	6	14	8	5	12	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	19	19	19	19	19	19	19	19	19	19	19	16	19	19	15	19	19	13	19	18	12	17	15	10	15	13	8	13	11	7	11	10	6	10	9	5	9	8	5
			Exposed	19	19	14	19	19	13	19	18	11	18	16	10	16	14	9	15	13	8	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	14	14	14	14	14	14	14	14	14	14	14	13	14	14	11	14	14	10	14	13	9	14	11	8	13	10	7	11	8	6	10	7	5	9	6	4	8	6	4
			Exposed	14	14	11	14	14	10	14	13	9	14	12	8	14	10	7	13	9	7	12	9	6	10	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	14	14	14	14	14	14	14	14	12	14	13	11	14	12	10	14	11	9	14	10	8	13	8	7	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3
			Exposed	14	12	10	14	11	9	14	10	8	13	9	7	12	8	6	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	18	18	15	18	18	14	18	18	12	18	16	11	18	15	10	18	13	9	18	12	8	18	10	7	15	9	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	18	15	10	18	13	9	18	12	8	18	10	7	17	9	6	15	9	6	14	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	20	20	20	20	20	17	20	20	15	20	20	13	20	19	12	19	17	11	17	15	9	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	20	18	12	18	16	10	16	15	9	15	13	8	13	12	7	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
40	B	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	11	8	11	10	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	7	11	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	11	9	12	9	8	11	9	7	11	8	5	9	7	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	14	13	9	14	11	8	14	10	7	13	9	6
			Exposed	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	14	9	14	11	8	14	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	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	12	16	16	10	15	14	9	14	12	8	12	11	7
			Exposed	16	16	16	16	16	16	16	16	16	16	16	15	16	16	13	16	16	12	16	16	11	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
	C	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	10	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	6	10	7	5	9	6	4	8	5	4	7	5	3	6	4	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	10	8	11	9	7	11	7	6	10	6	5	9	6	5	8	5	4
			Exposed	12	12	12	12	12	11	12	12	9	12	10	8	12	9	8	12	8	7	12	8	6	10	6	5	9	5	4	7	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	12	8	14	10	7	14	9	6	13	8	5	12	7	5	11	6	4
			Exposed	14	14	12	14	14	11	14	14	9	14	13	8	14	11	8	14	10	7	14	9	6	14	8	5	12	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	14	16	16	15	16	16	13	16	16	12	15	15	10	14	13	8	13	11	7	11	10	6	10	9	5	9	8	5
			Exposed	16	16	14	16	16	13	16	16	11	16	16	10	16	14	9	15	13	8	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	11	8	12	10	7	11	8	6	10	7	5	9	6	4	8	6	4
			Exposed	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	7	12	9	6	10	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	12	8	7	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3
			Exposed	12	12	10	12	11	9	12	10	8	12	9	7	12	8	6	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	15	15	15	15	15	14	15	15	12	15	15	11	15	15	10	15	13	9	15	12	8	15	10	7	14	9	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	15	15	10	15	13	9	15	12	8	15	10	7	15	9	6	15	9	6	14	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	18	18	18	18	18	17	18	18	15	18	18	13	17	17	12	17	17	11	16	15	9	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	18	18	12	18	16	10	16	15	9	15	13	8	13	12	7	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
50	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	6	9	7	5	9	6	4
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	9	7	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	10	12	12	9	12	11	8	12	10	7	12	9	6
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	11	8	12	10	7	12	8	6	12	7	5	11	6	4	10	6	4
		27-45	Interior	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	10	13	13	9	13	12	8	12	11	7	11	8	5
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	9	6	4	8	5	4	7	5	3	6	4	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	9	7	6	9	6	5	9	6	5	8	5	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	9	8	10	8	7	10	8	6	10	6	5	9	5	4	7	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	8	12	10	7	12	9	6	11	8	5	11	7	5	10	6	4
			Exposed	12	12	12	12	12	11	12	12	9	12	12	8	12	11	8	12	10	7	12	9	6	12	8	5	12	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	13	13	8	12	11	7	11	10	6	10	9	5	9	8	5
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	14	13	8	13	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	8	6	10	7	5	9	6	4	8	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	7	10	9	6	10	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	10	8	7	10	7	6	10	6	5	8	5	4	7	5	4	6	4	3
			Exposed	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	10	7	12	9	6	12	7	5	11	6	4	10	6	4	9	5	3
			Exposed	13	13	10	13	13	9	13	12	8	13	10	7	13	9	6	13	9	6	13	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	13	15	15	12	15	15	11	14	14	9	13	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	15	15	12	15	15	10	15	15	9	15	13	8	13	12	7	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	11	10	7	10	9	6
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	8	6	11	7	5	11	6	4	10	6	4
		27-45	Interior	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	10	12	12	9	11	11	8	11	11	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	7	12	11	6	10	9	6	9	8	5	8	7	4
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	4	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	6	5	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	6	5	8	5	4	7	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	11	10	7	10	9	6	10	8	5	10	7	5	9	6	4
			Exposed	11	11	11	11	11	9	11	11	8	11	11	8	11	10	7	11	9	6	11	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2	7	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	11	11	7	10	10	6	10	9	5	9	8	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	12	7	11	10	6	10	9	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	7	8	6	4	8	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	7	5	8	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	8	6	5	8	5	4	7	5	4	6	4	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	11	9	6	11	7	5	10	6	4	10	6	4	9	5	3	6	4	3
			Exposed	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	12	12	8	11	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	13	13	12	13	13	10	13	13	9	13	13	8	13	12	7	12	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
70	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	9	6	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	9	6	9	8	5	8	7	4
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	9	5	3	8	4	3	7	4	2	7	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	10	10	6	9	9	5	9	8	5	9	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	9	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	5	4	6	4	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	5	4	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	10	7	10	9	6	9	7	5	9	6	4	9	6	4	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	9	6	10	8	5	10	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	11	7	10	9	6	9	8	5	8	7	4	7	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	11	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	8	6	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	9	6	9	8	5	8	7	4
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	8	4	3	7	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	5	8	8	5	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	5	8	7	4	7	6	4	6	6	3	6	5	3	5	4	2
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	6	5	4	6	4	3	5	3	2
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	6	4	3	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	8	6	4	8	6	4	6	4	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	6	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	7	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	6	3	6	5	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	4	7	6	4	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	6	4
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	7	4
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	5	3	7	4	3	6	4	2	6	4	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	6	3	6	5	3	5	5	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	3	2	4	3	2	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3	6	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	48	48	48	48	48	46	48	48	41	48	48	37	48	48	33	48	43	30	48	39	27	46	33	23	39	28	20	34	24	17	29	21	15	26	19	13	23	16	12
			Exposed	48	48	33	48	42	29	48	38	26	47	34	24	43	31	21	39	28	19	35	25	18	30	21	15	25	18	13	22	16	11	19	14	10	17	12	8	15	11	7
		7-20	Interior	48	48	45	48	48	40	48	44	36	48	39	32	48	36	29	48	32	26	46	29	24	38	25	20	33	21	17	28	18	15	24	16	13	21	14	11	19	12	10
			Exposed	48	35	29	48	31	26	44	28	23	39	25	21	36	23	19	32	21	17	29	19	16	25	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7
		20-27	Interior	49	49	49	49	49	44	49	49	38	49	48	33	49	43	29	49	39	26	49	36	24	49	30	20	45	26	17	38	22	15	33	19	13	29	17	11	26	15	10
			Exposed	49	43	29	49	38	26	49	34	23	49	31	21	49	28	19	44	25	17	40	23	16	34	19	13	29	17	11	25	14	10	21	12	8	19	11	7	17	10	7
		27-45	Interior	49	49	49	49	49	49	49	49	49	49	49	43	49	49	38	49	49	34	49	45	30	42	38	25	36	32	21	31	28	17	27	24	15	24	21	13	21	19	11
			Exposed	49	49	38	49	48	33	48	43	29	43	38	25	39	35	23	35	32	20	32	29	18	27	24	15	23	21	13	20	18	11	18	16	10	15	14	8	14	12	7
	C	0-7	Interior	48	48	36	48	46	32	48	41	28	48	36	25	46	33	23	42	30	21	38	27	19	32	23	16	27	20	14	23	17	12	20	15	10	18	13	9	16	11	8
			Exposed	46	33	23	41	29	20	36	26	18	33	23	16	29	21	15	27	19	14	24	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	5
		7-20	Interior	48	38	31	48	34	28	47	30	25	42	27	22	38	25	20	35	22	18	32	20	17	27	17	14	23	15	12	20	13	10	17	11	9	15	10	8	13	9	7
			Exposed	38	25	20	34	22	18	30	20	16	27	18	14	25	16	13	22	15	12	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5	9	6	4
		20-27	Interior	49	46	32	49	41	28	49	37	25	49	33	22	49	30	20	47	27	18	43	25	17	36	21	14	31	18	12	27	15	10	23	13	9	20	12	8	18	10	7
			Exposed	49	30	20	46	26	18	41	24	16	37	21	14	33	19	13	30	18	12	28	16	11	23	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4
		27-45	Interior	49	49	41	49	49	36	49	46	31	46	41	28	42	37	25	38	34	22	35	31	20	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9	15	13	8
			Exposed	42	37	25	37	33	21	33	30	19	30	27	17	27	24	15	25	22	13	23	20	12	19	17	10	16	15	9	14	13	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	48	43	30	48	38	26	47	34	24	42	30	21	38	27	19	35	25	17	32	23	16	27	19	13	23	16	11	19	14	10	17	12	9	15	11	8	13	10	7
			Exposed	38	27	19	34	24	17	30	22	15	27	20	14	25	18	12	22	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	48	32	26	44	28	23	39	25	21	35	23	19	32	21	17	29	19	15	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7	11	7	6
			Exposed	32	20	17	28	18	15	25	16	13	23	15	12	21	13	11	19	12	10	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	49	38	26	49	34	23	49	31	21	48	28	19	43	25	17	39	23	15	36	21	14	30	17	12	26	15	10	22	13	9	19	11	8	17	10	7	15	9	6
			Exposed	43	25	17	38	22	15	34	20	13	31	18	12	28	16	11	25	15	10	23	13	9	20	11	8	17	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	49	48	33	48	43	29	43	38	25	39	35	22	35	31	20	32	28	18	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	12	8	12	11	7
			Exposed	35	31	20	31	28	17	28	25	15	25	22	14	23	20	12	21	18	11	19	17	10	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
10	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	33	23	33	28	20	33	24	17	29	21	15	26	19	13	23	16	12
			Exposed	33	33	33	33	33	29	33	33	26	33	33	24	33	31	21	33	28	19	33	25	18	30	21	15	25	18	13	22	16	11	19	14	10	17	12	8	15	11	7
		7-20	Interior	34	34	34	34	34	34	34	34	34	34	34	32	34	34	29	34	32	26	34	29	24	34	25	20	33	21	17	28	18	15	24	16	13	21	14	11	19	12	10
			Exposed	34	34	29	34	31	26	34	28	23	34	25	21	34	23	19	32	21	17	29	19	16	25	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7
		20-27	Interior	44	44	44	44	44	44	44	44	38	44	44	33	44	43	29	44	39	26	44	36	24	44	30	20	44	26	17	38	22	15	33	19	13	29	17	11	26	15	10
			Exposed	44	43	29	44	38	26	44	34	23	44	31	21	44	28	19	44	25	17	40	23	16	34	19	13	29	17	11	25	14	10	21	12	8	19	11	7	17	10	7
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	43	48	48	38	48	48	34	48	45	30	42	38	25	36	32	21	31	28	17	27	24	15	24	21	13	21	19	11
			Exposed	48	48	38	48	48	33	48	43	29	43	38	25	39	35	23	35	32	20	32	29	18	27	24	15	23	21	13	20	18	11	18	16	10	15	14	8	14	12	7
	C	0-7	Interior	33	33	33	33	33	32	33	33	28	33	33	25	33	33	23	33	30	21	33	27	19	32	23	16	27	20	14	23	17	12	20	15	10	18	13	9	16	11	8
			Exposed	33	33	23	33	29	20	33	26	18	33	23	16	29	21	15	27	19	14	24	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	5
		7-20	Interior	34	34	31	34	34	28	34	30	25	34	27	22	34	25	20	34	22	18	32	20	17	27	17	14	23	15	12	20	13	10	17	11	9	15	10	8	13	9	7
			Exposed	34	25	20	34	22	18	30	20	16	27	18	14	25	16	13	22	15	12	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5	9	6	4
		20-27	Interior	44	44	32	44	41	28	44	37	25	44	33	22	44	30	20	44	27	18	43	25	17	36	21	14	31	18	12	27	15	10	23	13	9	20	12	8	18	10	7
			Exposed	44	30	20	44	26	18	41	24	16	37	21	14	33	19	13	30	18	12	28	16	11	23	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4
		27-45	Interior	48	48	41	48	48	36	48	46	31	46	41	28	42	37	25	38	34	22	35	31	20	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9	15	13	8
			Exposed	42	37	25	37	33	21	33	30	19	30	27	17	27	24	15	25	22	13	23	20	12	19	17	10	16	15	9	14	13	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	33	33	30	33	33	26	33	33	24	33	30	21	33	27	19	33	25	17	32	23	16	27	19	13	23	16	11	19	14	10	17	12	9	15	11	8	13	10	7
			Exposed	33	27	19	33	24	17	30	22	15	27	20	14	25	18	12	22	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	34	32	26	34	28	23	34	25	21	34	23	19	32	21	17	29	19	15	26	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7	11	7	6
			Exposed	32	20	17	28	18	15	25	16	13	23	15	12	21	13	11	19	12	10	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	46	38	26	46	34	23	46	31	21	46	28	19	43	25	17	39	23	15	36	21	14	30	17	12	26	15	10	22	13	9	19	11	8	17	10	7	15	9	6
			Exposed	43	25	17	38	22	15	34	20	13	31	18	12	28	16	11	25	15	10	23	13	9	20	11	8	17	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	49	48	33	48	43	29	43	38	25	39	35	22	35	31	20	32	28	18	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	12	8	12	11	7
			Exposed	35	31	20	31	28	17	28	25	15	25	22	14	23	20	12	21	18	11	19	17	10	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
20	B	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17	23	21	15	23	19	13	23	16	12
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	18	23	21	15	23	18	13	22	16	11	19	14	10	17	12	8	15	11	7
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	21	17	23	18	15	23	16	13	21	14	11	19	12	10	19	12	10
			Exposed	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	21	17	23	19	16	23	16	13	21	14	11	18	12	10	16	10	8	14	9	7	12	8	7
		20-27	Interior	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	35	26	35	35	24	35	30	20	35	26	17	35	22	15	33	19	13	29	17	11	26	15	10
			Exposed	35	35	29	35	35	26	35	34	23	35	31	21	35	28	19	35	25	17	35	23	16	34	19	13	29	17	11	25	14	10	21	12	8	19	11	7	17	10	7
		27-45	Interior	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	39	39	34	39	39	30	39	38	25	36	32	21	31	28	17	27	24	15	24	21	13	21	19	11
			Exposed	39	39	38	39	39	33	39	39	29	39	38	25	39	35	23	35	32	20	32	29	18	27	24	15	23	21	13	20	18	11	18	16	10	15	14	8	14	12	7
	C	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	16	23	20	14	23	17	12	20	15	10	18	13	9	16	11	8
			Exposed	23	23	23	23	23	20	23	23	18	23	23	16	23	21	15	23	19	14	23	18	12	21	15	10	18	13	9	15	11	8	13	10	7	12	8	6	10	7	5
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	22	18	23	20	17	23	17	14	23	15	12	20	13	10	17	11	9	15	10	8	13	9	7
			Exposed	23	23	20	23	22	18	23	20	16	23	18	14	23	16	13	22	15	12	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	6	5	9	6	4
		20-27	Interior	35	35	32	35	35	28	35	35	25	35	33	22	35	30	20	35	27	18	35	25	17	35	21	14	31	18	12	27	15	10	23	13	9	20	12	8	18	10	7
			Exposed	35	30	20	35	26	18	35	24	16	35	21	14	33	19	13	30	18	12	28	16	11	23	14	9	20	12	8	17	10	7	15	9	6	13	8	5	12	7	4
		27-45	Interior	39	39	39	39	39	36	39	39	31	39	39	28	39	37	25	38	34	22	35	31	20	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9	15	13	8
			Exposed	39	37	25	37	33	21	33	30	19	30	27	17	27	24	15	25	22	13	23	20	12	19	17	10	16	15	9	14	13	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	23	23	23	23	23	23	23	23	21	23	23	19	23	23	17	23	23	16	23	19	13	23	16	11	19	14	10	17	12	9	15	11	8	13	10	7
			Exposed	23	23	19	23	23	17	23	22	15	23	20	14	23	18	12	22	16	11	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5	9	6	4
		7-20	Interior	23	23	23	23	23	23	23	23	21	23	23	19	23	21	17	23	19	15	23	17	14	22	14	12	19	12	10	16	11	9	14	9	8	13	8	7	11	7	6
			Exposed	23	20	17	23	18	15	23	16	13	23	15	12	21	13	11	19	12	10	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	36	36	26	36	34	23	36	31	21	36	28	19	36	25	17	36	23	15	36	21	14	30	17	12	26	15	10	22	13	9	19	11	8	17	10	7	15	9	6
			Exposed	36	25	17	36	22	15	34	20	13	31	18	12	28	16	11	25	15	10	23	13	9	20	11	8	17	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	40	40	33	40	40	29	40	38	25	39	35	22	35	31	20	32	28	18	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	12	8	12	11	7
			Exposed	35	31	20	31	28	17	28	25	15	25	22	14	23	20	12	21	18	11	19	17	10	16	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	8	7
		20-27	Interior	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	11	13	13	10	13	10	7
			Exposed	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	11	13	13	10	13	12	8	13	11	7	13	10	7
		27-45	Interior	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	14	14	11
			Exposed	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	11	14	14	10	14	14	8	14	12	7
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	5
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	9	6	4
		20-27	Interior	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	13	13	10	13	13	9	12	12	8	12	10	7
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	12	8	13	10	7	13	9	6	12	8	5	12	7	4	12	9	6
		27-45	Interior	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	10	14	14	10	13	13	9	13	13	8	13	11	8
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	14	9	14	13	8	12	11	7	11	10	6	10	9	5	11	8	5
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	6	9	7	5	9	6	4	9	6	4
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	9	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	9	6	5	8	5	4	7	5	4
		20-27	Interior	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	10	14	13	9	13	11	8	13	10	7	12	9	6
			Exposed	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	13	9	14	11	8	14	10	7	14	8	6	13	7	5	11	6	4	10	6	4
		27-45	Interior	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	11	15	15	10	14	14	9	13	12	8	12	11	7
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4
100	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	7
		20-27	Interior	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	11	11	11	10
			Exposed	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	10	11	11	8	11	11	7	11	10	7	11	10	7
		27-45	Interior	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	12	12	12	11
			Exposed	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	11	12	12	10	12	12	8	12	12	7	12	12	7
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	5
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	6	4
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	11	8	5	11	7	4
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	11	8	5	11	7	4
		27-45	Interior	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	10	12	12	9	12	12	8	12	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	11	10	6	10	9	5
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	6	4	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4	7	5	4	9	6	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	12	11	8	12	10	7	11	9	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	11	8	13	10	7	13	8	6	12	7	5	11	6	4	10	6	4
		27-45	Interior	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	11	14	14	10	13	13	9	13	12	8	12	11	7
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	14	9	14	12	7	12	11	6	10	9	6	9	8	5	8	7	4

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	11	11	8	11	10	7	11	9	6	11	8	6
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	10	11	11	9	11	10	7	11	9	6	11	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	9	7	11	8	6	11	7	5	9	6	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	8	11	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	14	13	8	14	11	7	14	9	6	14	8	5	13	7	5
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	14	12	8	14	11	8	14	9	6	14	8	5	12	7	5	11	6	4	9	5	3	8	5	3
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	12	16	16	10	15	14	8	13	12	7	12	10	6	10	9	5
			Exposed	16	16	16	16	16	16	16	16	14	16	16	13	16	16	11	16	16	10	16	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	10	7	11	9	7	11	9	6	10	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	8	7	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3
			Exposed	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	13	7	5	11	6	4	10	6	4	9	5	3
			Exposed	14	14	10	14	13	9	14	12	8	14	10	7	14	9	6	14	9	6	14	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	14	16	16	12	16	16	11	16	15	10	14	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	16	16	12	16	16	11	16	15	9	15	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	9	11	11	8	11	9	6	11	8	6	10	7	5	8	6	4	7	5	4	6	5	3
			Exposed	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	11	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	11	10	8	11	9	7	11	8	6	11	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	15	15	13	15	15	11	15	15	10	15	14	9	15	12	8	15	11	7	15	10	7	15	8	6	13	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	15	12	8	15	11	7	15	10	6	15	9	6	14	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	14	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	17	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
40	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	6	9	8	6	9	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8	6	9	7	5	9	6	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	8	10	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	12	9	6	12	8	5	11	7	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	11	8	12	9	6	12	8	5	12	7	5	11	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	13	13	8	12	12	7	12	10	6	10	9	5
			Exposed	14	14	14	14	14	14	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	13	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	5	4
			Exposed	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	7	5	9	6	4	7	5	4	6	5	3	6	4	3	5	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	8	10	8	7	9	7	6	9	6	5	8	5	4	7	5	4	6	4	3
			Exposed	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	11	7	5	11	6	4	10	6	4	9	5	3
			Exposed	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	12	9	6	12	8	5	11	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12	14	14	11	14	14	10	13	13	8	12	11	7	11	9	6	9	8	5	8	7	4	7	6	4
			Exposed	14	14	12	14	14	11	14	14	9	14	13	8	13	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	9	10	10	8	10	9	6	10	8	6	10	7	5	8	6	4	7	5	4	6	5	3
			Exposed	10	10	9	10	10	8	10	10	7	10	10	7	10	9	6	10	8	5	10	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	7	10	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	10	10	8	10	9	7	10	8	6	10	7	6	10	6	5	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	13	13	13	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	10	7	13	8	6	12	7	5	11	6	4	9	5	4	8	5	3	7	4	3
			Exposed	13	12	8	13	11	7	13	10	6	13	9	6	13	8	5	12	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	15	15	15	15	15	14	15	15	12	15	15	11	14	14	10	14	14	9	13	13	8	12	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	15	15	10	15	14	8	14	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
50	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	10	9	6	10	8	5	10	7	5	10	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	6	10	8	5	10	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	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	10	12	12	8	11	11	7	10	10	6	10	9	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	7	11	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3	6	4	2
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	7	5	4	7	5	4	6	4	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	9	6	4	8	5	3
			Exposed	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	9	6	10	8	5	10	7	4	10	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	11	11	7	10	9	6	9	8	5	8	7	4	7	6	4	7	6	4
			Exposed	12	12	12	12	12	11	12	12	9	12	12	8	12	12	7	12	11	6	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	8	6	4	7	5	4	6	5	3	6	4	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	7	9	7	6	8	6	5	8	5	4	7	4	4	6	4	3	5	3	3
			Exposed	9	9	8	9	9	7	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2	3	2	2
		20-27	Interior	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	8	6	10	7	5	10	6	4	9	5	4	8	5	3	7	4	3
			Exposed	11	11	8	11	11	7	11	10	6	11	9	6	11	8	5	11	7	5	11	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	12	12	9	12	12	8	11	11	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	13	13	10	13	13	8	13	12	7	12	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	7	5	4	7	4	3	6	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	6	9	8	5	9	7	5	9	6	4	9	5	3	8	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	9	9	6	9	9	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	10	6	10	9	5	9	8	5	7	7	4	7	6	3
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	4	6	5	3	6	4	3	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	6	5	4	6	4	3	5	4	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	7	5	8	6	4	8	6	4	8	5	3
			Exposed	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	6	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	5	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	4	4	6	4	3	5	3	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	6	5	7	5	4	7	4	4	6	4	3	5	3	2	4	3	2	4	2	2	3	2	2
		20-27	Interior	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	10	7	10	8	6	9	7	5	9	6	4	8	5	4	8	5	3	7	4	3	6	4	3
			Exposed	10	10	8	10	10	7	10	10	6	10	9	6	10	8	5	10	7	5	10	6	4	10	5	4	8	5	3	7	4	3	6	3	2	5	3	2	5	3	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	10	10	6	10	9	5	9	8	5	8	7	4	7	6	4	6	5	3
			Exposed	11	11	10	11	11	8	11	11	7	11	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
70	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	8	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	5	8	8	5	7	7	4	7	6	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	5	4	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	8	6	4	8	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	8	5	8	8	5	8	7	4	7	6	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	4	3	5	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4	6	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6	6	4	6	5	3	6	4	3	5	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7	9	8	6	8	7	5	8	6	4	8	5	4	7	5	3	7	4	3
			Exposed	9	9	8	9	9	7	9	9	6	9	9	6	9	8	5	9	7	5	9	6	4	8	5	3	7	4	3	6	4	2	5	3	2	5	3	2	5	3	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	9	5	8	8	5	8	7	4	7	6	4	6	5	3
			Exposed	9	9	9	9	9	8	9	9	7	9	9	7	9	9	6	9	9	5	9	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	5	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5	7	7	4	7	6	3
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	6	4	6	5	3	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2	6	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	4	3	5	3	2	4	3	2	4	3	2
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	5	4	4	5	4	3	5	3	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	4	4	6	4	3	5	3	3	5	3	2	4	2	2	3	2	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
			Exposed	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	8	5	8	7	4	7	5	3	6	4	3	6	3	2	5	3	2	5	3	2	5	3	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	8	5	7	7	4	7	6	4	6	5	3
			Exposed	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	8	5	8	8	5	8	7	4	7	6	3	6	5	3	5	4	3	4	4	2	4	3	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2	4	3	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	6	4	6	5	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3	6	4	3	6	4	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	5	5	3	5	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	3	5	3	3	4	3	2	4	2	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	6	5	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	7	5	3	7	4	3	6	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6	6	4	6	6	3
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	3	2	4	3	2
		20-27	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5	5	3
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	2
		27-45	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	6	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	6	4	6	5	3	5	5	3	5	4	3	4	4	2
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	3	2	4	3	2
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	3	3	4	3	2	4	2	2	3	2	2
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	4	6	5	3	5	4	3
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3	6	4	3	6	3	2	5	3	2	5	3	2	5	3	2
		27-45	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	6	6	4	6	6	4	6	5	3
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	4	7	6	3	6	5	3	5	4	3	4	4	2

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	47	47	47	47	47	45	47	47	40	47	47	36	47	47	33	47	42	30	47	39	27	45	32	23	38	28	19	33	24	17	29	21	14	25	18	13	22	16	11
			Exposed	47	47	32	47	41	29	47	37	26	46	33	23	42	30	21	38	27	19	34	25	17	29	21	15	25	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	47	47	44	47	47	39	47	43	35	47	38	32	47	35	28	47	32	26	45	29	24	38	24	20	32	21	17	28	18	15	24	15	13	21	14	11	19	12	10
			Exposed	47	35	28	47	31	25	43	28	23	38	25	20	35	22	18	32	20	17	29	19	15	24	16	13	21	13	11	18	12	9	15	10	8	14	9	7	12	8	6
		20-27	Interior	47	47	47	47	47	43	47	47	37	47	47	33	47	42	29	47	38	26	47	35	24	47	29	20	44	25	17	37	22	15	33	19	13	29	17	11	25	15	10
			Exposed	47	42	28	47	37	25	47	33	23	47	30	20	47	27	18	43	25	17	39	23	15	33	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	42	48	48	37	48	48	33	48	44	30	41	37	24	35	31	20	30	27	17	26	24	14	23	21	13	21	18	11
			Exposed	48	48	37	48	47	32	47	42	28	42	38	25	38	34	22	35	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	13	8	13	12	7
	C	0-7	Interior	47	47	35	47	45	31	47	40	28	47	36	25	45	32	23	41	29	20	37	27	19	31	22	16	26	19	13	23	16	12	20	14	10	17	13	9	15	11	8
			Exposed	45	32	22	40	29	20	35	26	18	32	23	16	29	21	15	26	19	13	24	17	12	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	47	37	31	47	33	27	46	30	24	41	27	22	37	24	20	34	22	18	31	20	16	26	17	14	22	14	12	19	12	10	17	11	9	15	9	8	13	8	7
			Exposed	37	24	20	33	21	18	30	19	16	27	17	14	24	16	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4
		20-27	Interior	47	45	31	47	40	27	47	36	24	47	32	22	47	29	20	46	27	18	42	24	16	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8	18	10	7
			Exposed	47	29	20	45	26	18	40	23	16	36	21	14	33	19	13	30	17	12	27	16	11	23	13	9	19	11	8	17	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	48	48	40	48	48	35	48	45	31	45	40	27	41	37	24	37	33	22	34	30	19	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	13	8
			Exposed	41	36	24	36	32	21	33	29	18	29	26	16	27	24	15	24	22	13	22	20	12	19	17	10	16	14	9	14	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	47	42	29	47	37	26	46	33	23	41	30	21	37	27	19	34	24	17	31	22	16	26	19	13	22	16	11	19	14	10	17	12	8	15	11	7	13	9	7
			Exposed	37	27	19	33	24	17	30	21	15	27	19	13	24	17	12	22	16	11	20	14	10	17	12	8	14	10	7	12	9	6	11	8	5	9	7	5	8	6	4
		7-20	Interior	47	31	25	43	28	23	38	25	20	34	22	18	31	20	17	28	18	15	26	17	14	22	14	12	19	12	10	16	10	9	14	9	7	12	8	6	11	7	6
			Exposed	31	20	16	28	18	15	25	16	13	22	14	12	20	13	11	18	12	10	17	11	9	14	9	7	12	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	47	38	25	47	33	23	47	30	20	47	27	18	42	24	16	39	22	15	35	20	14	29	17	12	25	15	10	22	13	8	19	11	7	17	10	6	15	8	6
			Exposed	42	24	16	38	22	15	34	19	13	30	17	12	27	16	11	25	14	10	23	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	48	47	32	47	42	28	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	24	21	13	20	18	11	18	16	10	15	14	8	14	12	7	12	11	6
			Exposed	34	30	19	30	27	17	27	24	15	25	22	13	22	20	12	20	18	11	18	17	10	16	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
10	B	0-7	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	30	33	33	27	33	32	23	33	28	19	33	24	17	29	21	14	25	18	13	22	16	11
			Exposed	33	33	32	33	33	29	33	33	26	33	33	23	33	30	21	33	27	19	33	25	17	29	21	15	25	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	32	33	33	28	33	32	26	33	29	24	33	24	20	32	21	17	28	18	15	24	15	13	21	14	11	19	12	10
			Exposed	33	33	28	33	31	25	33	28	23	33	25	20	33	22	18	32	20	17	29	19	15	24	16	13	21	13	11	18	12	9	15	10	8	14	9	7	12	8	6
		20-27	Interior	43	43	43	43	43	43	43	43	37	43	43	33	43	42	29	43	38	26	43	35	24	43	29	20	43	25	17	37	22	15	33	19	13	29	17	11	25	15	10
			Exposed	43	42	28	43	37	25	43	33	23	43	30	20	43	27	18	43	25	17	39	23	15	33	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	42	47	47	37	47	47	33	47	44	30	41	37	24	35	31	20	30	27	17	26	24	14	23	21	13	21	18	11
			Exposed	47	47	37	47	47	32	47	42	28	42	38	25	38	34	22	35	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	13	8	13	12	7
	C	0-7	Interior	33	33	33	33	33	31	33	33	28	33	33	25	33	32	23	33	29	20	33	27	19	31	22	16	26	19	13	23	16	12	20	14	10	17	13	9	15	11	8
			Exposed	33	32	22	33	29	20	33	26	18	32	23	16	29	21	15	26	19	13	24	17	12	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	33	33	31	33	33	27	33	30	24	33	27	22	33	24	20	33	22	18	31	20	16	26	17	14	22	14	12	19	12	10	17	11	9	15	9	8	13	8	7
			Exposed	33	24	20	33	21	18	30	19	16	27	17	14	24	16	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4
		20-27	Interior	43	43	31	43	40	27	43	36	24	43	32	22	43	29	20	43	27	18	42	24	16	35	20	14	30	17	12	26	15	10	23	13	9	20	12	8	18	10	7
			Exposed	43	29	20	43	26	18	40	23	16	36	21	14	33	19	13	30	17	12	27	16	11	23	13	9	19	11	8	17	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	47	47	40	47	47	35	47	45	31	45	40	27	41	37	24	37	33	22	34	30	19	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	13	8
			Exposed	41	36	24	36	32	21	33	29	18	29	26	16	27	24	15	24	22	13	22	20	12	19	17	10	16	14	9	14	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	33	33	29	33	33	26	33	33	23	33	30	21	33	27	19	33	24	17	31	22	16	26	19	13	22	16	11	19	14	10	17	12	8	15	11	7	13	9	7
			Exposed	33	27	19	33	24	17	30	21	15	27	19	13	24	17	12	22	16	11	20	14	10	17	12	8	14	10	7	12	9	6	11	8	5	9	7	5	8	6	4
		7-20	Interior	33	31	25	33	28	23	33	25	20	33	22	18	31	20	17	28	18	15	26	17	14	22	14	12	19	12	10	16	10	9	14	9	7	12	8	6	11	7	6
			Exposed	31	20	16	28	18	15	25	16	13	22	14	12	20	13	11	18	12	10	17	11	9	14	9	7	12	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	44	38	25	44	33	23	44	30	20	44	27	18	42	24	16	39	22	15	35	20	14	29	17	12	25	15	10	22	13	8	19	11	7	17	10	6	15	8	6
			Exposed	42	24	16	38	22	15	34	19	13	30	17	12	27	16	11	25	14	10	23	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	48	47	32	47	42	28	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	24	21	13	20	18	11	18	16	10	15	14	8	14	12	7	12	11	6
			Exposed	34	30	19	30	27	17	27	24	15	25	22	13	22	20	12	20	18	11	18	17	10	16	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
20	B	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	19	23	23	17	23	21	14	23	18	13	22	16	11
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	19	23	23	17	23	21	15	23	18	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	21	17	23	18	15	23	15	13	21	14	11	19	12	10
			Exposed	23	23	23	23	23	23	23	23	23	23	23	20	23	22	18	23	20	17	23	19	15	23	16	13	21	13	11	18	12	9	15	10	8	14	9	7	12	8	6
		20-27	Interior	34	34	34	34	34	34	34	34	34	34	34	33	34	34	29	34	34	26	34	34	24	34	29	20	34	25	17	34	22	15	33	19	13	29	17	11	25	15	10
			Exposed	34	34	28	34	34	25	34	33	23	34	30	20	34	27	18	34	25	17	34	23	15	33	19	13	28	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	33	38	38	30	38	37	24	35	31	20	30	27	17	26	24	14	23	21	13	21	18	11
			Exposed	38	38	37	38	38	32	38	38	28	38	38	25	38	34	22	35	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	13	8	13	12	7
	C	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	19	23	22	16	23	19	13	23	16	12	20	14	10	17	13	9	15	11	8
			Exposed	23	23	22	23	23	20	23	23	18	23	23	16	23	21	15	23	19	13	23	17	12	20	15	10	17	12	9	15	11	7	13	9	6	11	8	6	10	7	5
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	22	18	23	20	16	23	17	14	22	14	12	19	12	10	17	11	9	15	9	8	13	8	7
			Exposed	23	23	20	23	21	18	23	19	16	23	17	14	23	16	13	22	14	12	20	13	11	17	11	9	14	9	8	12	8	7	11	7	6	9	6	5	8	5	4
		20-27	Interior	34	34	31	34	34	27	34	34	24	34	32	22	34	29	20	34	27	18	34	24	16	34	20	14	30	17	12	26	15	10	23	13	9	20	12	8	18	10	7
			Exposed	34	29	20	34	26	18	34	23	16	34	21	14	33	19	13	30	17	12	27	16	11	23	13	9	19	11	8	17	10	7	15	8	6	13	7	5	11	7	4
		27-45	Interior	38	38	38	38	38	35	38	38	31	38	38	27	38	37	24	37	33	22	34	30	19	29	26	16	24	22	13	21	19	11	18	16	10	16	14	9	14	13	8
			Exposed	38	36	24	36	32	21	33	29	18	29	26	16	27	24	15	24	22	13	22	20	12	19	17	10	16	14	9	14	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	19	23	23	19	23	23	17	23	22	16	23	19	13	22	16	11	19	14	10	17	12	8	15	11	7	13	9	7
			Exposed	23	23	19	23	23	17	23	21	15	23	19	13	23	17	12	22	16	11	20	14	10	17	12	8	14	10	7	12	9	6	11	8	5	9	7	5	8	6	4
		7-20	Interior	23	23	23	23	23	23	23	23	20	23	22	18	23	20	17	23	18	15	23	17	14	22	14	12	19	12	10	16	10	9	14	9	7	12	8	6	11	7	6
			Exposed	23	20	16	23	18	15	23	16	13	22	14	12	20	13	11	18	12	10	17	11	9	14	9	7	12	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	35	35	25	35	33	23	35	30	20	35	27	18	35	24	16	35	22	15	35	20	14	29	17	12	25	15	10	22	13	8	19	11	7	17	10	6	15	8	6
			Exposed	35	24	16	35	22	15	34	19	13	30	17	12	27	16	11	25	14	10	23	13	9	19	11	7	16	9	6	14	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	39	39	32	39	39	28	39	38	25	38	34	22	34	31	20	31	28	18	28	25	16	24	21	13	20	18	11	18	16	10	15	14	8	14	12	7	12	11	6
			Exposed	34	30	19	30	27	17	27	24	15	25	22	13	22	20	12	20	18	11	18	17	10	16	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

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ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-OSB
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	8	6
		20-27	Interior	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	11	12	12	10	12	12	10
			Exposed	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	11	12	12	9	12	12	8	12	11	7	12	9	6
		27-45	Interior	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	11
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	12	13	13	11	13	13	9	13	13	8	13	12	7
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	7	5	8	7	5
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4	8	5	4
		20-27	Interior	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	10	12	12	9	12	12	8	12	10	7	12	8	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	8	6	12	7	5	11	7	4
		27-45	Interior	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	11	13	13	10	13	13	9	13	13	8	13	11	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	13	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8	9	9	7	9	9	7	9	9	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	7	10	8	6	10	7	6	10	7	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	7	10	8	6	10	7	5	9	6	5	8	5	4	7	4	4
		20-27	Interior	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	10	13	13	8	13	11	7	12	10	6	12	8	6
			Exposed	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	13	9	14	11	7	14	9	6	13	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	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	11	14	14	10	14	14	8	13	12	7	12	11	6
			Exposed	15	15	15	15	15	15	15	15	15	15	15	13	15	15	12	15	15	11	15	15	10	15	14	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
100	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	6
		20-27	Interior	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	11	11	11	10
			Exposed	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	9	11	11	8	11	11	7	11	9	6	11	9	6
		27-45	Interior	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	12	12	12	11
			Exposed	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	11	12	12	9	12	12	8	12	12	7
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	8	6	5	8	5	4	8	5	4
		20-27	Interior	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	10	11	11	10	11	11	8	11	11	7	11	10	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	11	7	5	11	7	4
		27-45	Interior	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	11	12	12	10	12	12	9	12	12	8	12	12	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	12	7	12	11	6	11	9	6	9	8	5
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	8	6	9	7	6	9	7	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	6	9	7	5	9	6	5	8	5	4	7	4	4	7	4	4
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	8	12	11	7	11	10	6	11	8	6	11	8	6
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	11	7	12	9	6	12	8	5	12	7	5	11	6	4	10	5	4
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	10	13	13	8	12	12	7	12	11	6	12	11	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	8	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4

Span Tables

Design Criteria for Span Tables:

Values in the maximum allowable 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: 30ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-16 Sec 29.4.4 with Provisions from SEAOC PV2-2017
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, kzt = 1.0
- γE = 1.0 for 'Interior' spans, γ_E = 1.5 for 'Exposed' spans (ASCE 7-16, Fig. 29.4-7)

Snow Design Assumptions

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

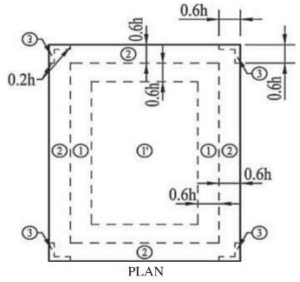
Seismic Design Assumptions

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

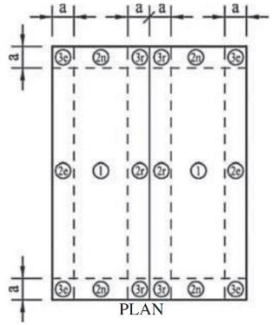
Span Tables

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.
- ‘Exposed’ spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.
- 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 7-16, Fig. 30.3-2A to 30.3-2D



Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 45°

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

Roof Tilt 0°-7°

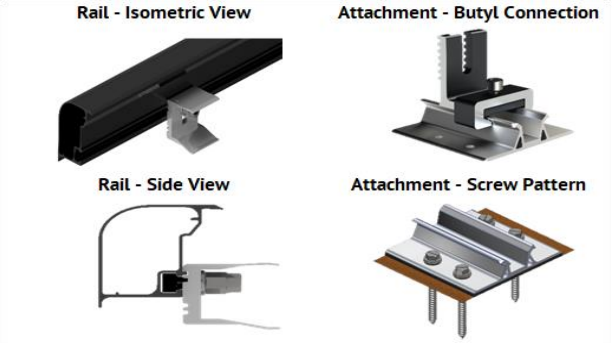
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3

Roof Tilt 7°-27°

Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r

Roof Tilt 27°-45°

Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e



Trim Rail - DtD Ply

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	7	5	9	7	5
		20-27	Interior	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	11	12	12	9	11	11	8	11	11	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	11	8	5
		27-45	Interior	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	13	13	13	13	13	12	12	11	12	12	10
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	11	13	13	9	13	13	8	12	11	7	11	10	6	10	9	6
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	8	8	7	8	7	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	11	11	9	11	11	7	10	10	7	10	9	6	10	9	6
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	11	8	12	10	6	11	8	5	11	7	5	10	6	4	10	5	4
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	12	12	12	10	11	11	8	11	11	7	10	10	7
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	13	13	9	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	9	6	9	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	7	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	8	6	8	7	5	8	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	12	12	8	11	11	7	11	9	6	10	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	12	8	5	11	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	14	14	14	13	13	12	12	12	10	12	12	8	11	11	7	10	10	6	10	9	5
			Exposed	15	15	15	15	15	15	15	15	13	15	15	12	15	15	11	14	14	9	14	14	8	13	12	7	11	10	6	10	9	5	8	8	4	7	7	4	7	6	3
70	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	10	8	5
		27-45	Interior	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	12	12	12	12	12	11	11	11	11	11	10
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	12	12	9	12	12	8	11	11	7	11	10	6	10	9	6
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	7	4	4	7	4	4
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	7	9	9	6	9	9	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	10	8	5	10	7	5	9	6	4	9	5	4
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	10	12	12	9	11	11	11	11	10	10	10	8	10	10	7	9	9	7
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	10	12	12	9	11	11	7	11	10	6	10	9	5	9	8	5	8	7	4	7	6	3
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	7	5	8	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	7	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	10	10	7	10	9	6	9	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	9	6	11	8	5	10	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	13	13	13	13	12	12	12	11	11	10	11	11	8	10	10	7	10	10	6	9	9	5
			Exposed	14	14	14	14	14	14	14	14	13	14	14	12	13	13	11	13	13	9	13	13	8	12	12	7	11	10	6	10	9	5	8	8	4	7	7	4	7	6	3
80	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	8	5
		27-45	Interior	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	10	10	10	10	10	10	10
			Exposed	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	9	11	11	8	10	10	7	10	10	6	9	9	6
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	6	4	4
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	8	8	7	8	8	6
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	8	5	9	7	5	8	6	4	8	5	4
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	10	10	8	9	9	7	9	9	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	10	10	7	10	10	6	10	9	5	9	8	5	8	7	4	7	7	4	7	6	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	6	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	5	3	6	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	9	6	9	8	5	8	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	8	7	4	7	5	3	6	4	3
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	11	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	11	11	7	11	10	6	10	9	5	8	8	4	7	7	4	7	6	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	6
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	8	5	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	5	8	8	5	8	7	4	8	7	4
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5	8	7	5	8	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4	8	5	3	8	5	3	8	5	3
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	9	9	8	9	9	7	8	8	6	8	8	5	8
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	10	10	7	10	10	6	9	9	5	8	8	4	7	7	4	7	6	3
100	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4	7	5	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	7	8	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	5	8	8	5	8	7	4	8	7	4
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	6	4	7	5	3	7	5	3	7	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	6	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	9	5	8	8	4	7	7	4	7	6	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	23	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	22	15	24	19	14	23	17	12	21	15	11
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	21	25	22	18	25	20	16	24	17	14
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	22	25	22	18	25	19	16	25	17	14	22	14	12	20	13	10	17	11	9
		20-27	Interior	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	21	31	27	18	31	24	16	29	21	14
			Exposed	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	24	31	31	22	31	27	18	31	23	16	31	20	14	30	17	12	26	15	10	23	14	9
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	33	33	26	31	31	22	29	29	19	28	26	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30	35	35	27	35	34	22	33	29	19	28	25	16	25	22	13	22	19	12	19	17	10
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	19	24	24	17	24	21	15	24	18	13	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	23	24	24	24	21	24	24	19	24	24	17	24	21	15	24	18	13	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	24	20	25	21	17	24	18	15	23	16	13	21	14	11	19	12	10
			Exposed	25	25	25	25	25	25	25	25	23	25	25	20	25	22	18	25	20	17	25	19	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7	12	8	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	26	31	31	23	31	29	20	31	25	17	29	22	15	28	19	13	26	17	11	25	15	10
			Exposed	31	31	28	31	31	25	31	31	22	31	30	20	31	27	18	31	25	17	31	22	15	31	19	13	28	16	11	24	14	10	21	12	8	18	11	7	16	10	6
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	32	32	24	30	30	20	28	27	17	26	24	14	23	21	13	21	18	11
			Exposed	35	35	35	35	35	32	35	35	28	35	35	25	35	34	22	34	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	14	8	13	12	7
	D	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	22	25	25	19	25	23	16	25	20	14	24	17	12	21	15	11	18	13	9
			Exposed	25	25	25	25	25	24	25	25	21	25	25	19	25	25	17	25	23	16	25	21	15	24	17	12	20	15	10	18	13	9	15	11	8	14	10	7	12	9	6
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	22	25	24	20	25	20	17	24	17	14	23	15	12	20	13	11	18	11	9	16	10	8
			Exposed	25	25	24	25	25	21	25	23	19	25	21	17	25	19	15	25	17	14	24	16	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	7	5
		20-27	Interior	33	33	33	33	33	33	33	33	29	33	33	26	33	33	24	33	32	21	33	29	20	33	24	17	31	21	14	29	18	12	27	16	11	24	14	9	21	12	8
			Exposed	33	33	24	33	31	21	33	28	19	33	25	17	33	23	15	33	21	14	32	19	13	27	16	11	23	14	9	20	12	8	18	10	7	15	9	6	14	8	5
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	33	36	36	30	35	35	27	34	34	24	31	31	20	29	26	16	25	23	14	22	20	12	19	17	11	17	15	9
			Exposed	37	37	30	37	37	26	37	35	23	35	31	20	32	28	18	29	26	16	26	24	15	22	20	12	19	17	10	17	15	9	14	13	8	13	11	7	11	10	6
40	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	16
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	19	14	20	17	12	20	15	11
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	20	16	20	17	14
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	19	16	21	17	14	21	14	12	20	13	10	17	11	9
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	21	26	26	18	26	26	18	26	24	16	25	21	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	18	26	23	16	26	20	14	26	17	12	26	15	10	23	14	9
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	26	27	27	22	26	26	19	24	24	16
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	22	30	29	19	28	25	16	25	22	13	22	19	12	19	17	10
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	15	20	18	13	20	16	11
			Exposed	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	18	13	20	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17	20	18	15	19	16	13	19	14	11	18	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	20	17	21	19	15	21	16	13	21	13	11	18	12	10	16	10	8	14	9	7	12	8	6
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	20	26	25	17	25	22	15	24	19	13	23	17	11	21	15	10
			Exposed	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	25	17	26	22	15	26	19	13	26	16	11	24	14	10	21	12	8	18	11	7	16	10	6
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	28	28	24	26	26	20	25	25	17	23	23	14	22	21	13	20	18	11
			Exposed	30	30	30	30	30	30	30	30	28	30	30	25	30	30	22	30	30	20	30	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	14	8	13	12	7
	D	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	16	22	20	14	22	17	12	21	15	11	18	13	9
			Exposed	22	22	22	22	22	22	22	22	21	22	22	19	22	22	17	22	22	16	22	21	15	22	17	12	20	15	10	18	13	9	15	11	8	14	10	7	12	9	6
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	20	17	22	17	14	21	15	12	20	13	11	18	11	9	16	10	8
			Exposed	23	23	23	23	23	21	23	23	19	23	21	17	23	19	15	23	17	14	23	16	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	7	5
		20-27	Interior	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	21	28	28	20	28	24	17	26	21	14	25	18	12	23	16	11	22	14	9	21	12	8
			Exposed	28	28	24	28	28	21	28	28	19	28	25	17	28	23	15	28	21	14	28	19	13	27	16	11	23	14	9	20	12	8	18	10	7	15	9	6	14	8	5
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	31	31	27	30	30	24	27	27	20	26	26	16	24	23	14	22	20	12	19	17	11	17	15	9
			Exposed	32	32	30	32	32	26	32	32	23	32	31	20	32	28	18	29	26	16	26	24	15	22	20	12	19	17	10	17	15	9	14	13	8	13	11	7	11	10	6
50	B	0-7	Interior	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	16	16	16	16
			Exposed	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	14	16	16	12	16	15	11
		7-20	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	17	17	14
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	17	14	18	14	12	18	13	10	17	11	9
		20-27	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	18	22	22	16	21	21	14
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	18	23	23	16	23	20	14	23	17	12	22	15	10	21	14	9
		27-45	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	25	25	24	24	22	23	23	19	22	22	16
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	19	25	25	16	24	22	13	22	19	12	19	19	12	19	17	10
	C	0-7	Interior	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	16	16	11
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	13	16	15	11	16	16	13	16	16	9	16	12	8	14	10	7
		7-20	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	17	17	15	17	16	13	16	14	11	15	12	10
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	16	13	18	13	11	17	12	10	16	10	8	14	9	7	12	8	6
		20-27	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17	22	22	15	21	19	13	20	17	11	19	15	10
			Exposed	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	23	17	23	22	15	23	19	13	23	16	11	22	14	10	21	12	8	18	11	7	16	10	6
		27-45	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	26	26	25	25	24	24	24	20	22	22	17	21	21	14	20	20	13	19	18	11
			Exposed	27	27	27	27	27	27	27	27	27	27	27	25	27	27	22	27	27	20	26	26	18	25	24	15	23	20	12	20	18	11	17	15	9	15	14	8	13	12	7
	D	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	18	14	18	17	12	18	15	11	18	13	9	16	13	9
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	16	18	18	15	18	17	12	18	15	10	18	13	9	15	11	8	14	10	7	12	9	6
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	19	17	19	17	14	18	15	12	17	13	11	16	11	9	16	10	8
			Exposed	20	20	20	20	20	20	20	20	19	20	20	17	20	19	15	20	17	14	20	16	13	19	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	7	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	20	24	24	17	23	21	14	22	18	12	21	16	11	20	14	9	19	12	8
			Exposed	24	24	24	24	24	21	24	24	19	24	24	17	24	23	15	24	21	14	24	19	13	24	16	11	23	14	9	20	12	8	18	10	7	15	9	6	14	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	26	26	24	25	25	20	23	23	16	22	22	14	20	20	12	19	17	11	17	15	9
			Exposed	28	28	28	28	28	26	28	28	23	28	28	20	28	28	18	27	26	16	26	24	15	22	20	12	19	17	10	17	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
		20-27	Interior	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	14
			Exposed	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	9
		27-45	Interior	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	17	17	16	16	16	16	16	16	16	16
			Exposed	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	17	17	16	16	12	16	16	10	16	16	10
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	7
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8	6
		20-27	Interior	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	13	11	13	13	10	13	13	10
			Exposed	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	11	14	14	10	14	12	8	13	11	7	13	10	6	13	10	6
		27-45	Interior	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	16	16	16	16	16	15	15	14	14	14	13	14	14	11	14	14	11
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	16	16	12	16	16	11	15	15	9	14	14	8	13	12	7	13	12	7
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	9	6
		7-20	Interior	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	9	11	10	8	11	10	8
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	10	8	11	8	7	11	7	6	10	7	5	10	7	5	10	7	5
		20-27	Interior	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	14	14	11	14	14	9	13	12	8	13	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	14	9	15	12	8	14	10	7	14	9	6	13	8	5	13	8	5
		27-45	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	17	17	16	16	16	14	15	15	12	14	14	11	14	14	9	14	14	9
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	18	18	15	18	18	12	17	17	10	16	15	9	14	13	8	13	11	7	11	10	6	11	10	6
100	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		20-27	Interior	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	12	12	12	12
			Exposed	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	12	10	12	12	9
		27-45	Interior	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	15	15	15	15	15	15	15	15
			Exposed	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	13	15	15	12	15	15	10	15	15	10
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	8	6
		20-27	Interior	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	11	12	12	10	12	12	10
			Exposed	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	11	12	12	10	12	12	8	12	11	7	12	10	6	12	10	6
		27-45	Interior	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	15	15	15	15	15	14	14	14	14	14	13	13	13	11	13	13	11
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	12	15	15	11	14	14	9	14	14	8	13	12	7	13	12	7
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	9	6	9	9	6
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7	10	7	6	10	7	5	10	7	5	10	7	5
		20-27	Interior	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	12	13	13	11	13	13	9	12	12	8	12	12	8
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	11	14	14	9	14	12	8	13	10	7	13	9	6	12	8	5	12	8	5
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	16	16	16	15	15	14	14	14	12	14	14	11	13	13	9	13	13	9
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	16	16	12	16	16	10	15	15	9	14	13	8	13	11	7	11	10	6	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	12	12	9	12	11	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	11	8	12	9	7	11	8	6	10	7	5
		7-20	Interior	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	10	12	11	9	12	10	8	12	8	7	12	8	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	11	9	12	9	8	12	8	7	11	7	6	10	6	5	8	5	4
		20-27	Interior	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	10	15	13	9	15	12	8	14	10	7
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	12	15	15	11	15	13	9	15	11	8	15	10	7	15	9	6	13	7	5	11	7	4
		27-45	Interior	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	15	16	16	13	15	15	11	14	14	9	14	13	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	11	16	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	11	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	10	8	12	9	7	11	8	6	10	7	5	9	6	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	12	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	12	15	15	11	15	12	8	15	11	7	14	9	6	13	8	5	12	7	5
			Exposed	15	15	14	15	15	12	15	15	11	15	15	10	15	13	9	15	12	8	15	11	7	15	9	6	14	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	16	16	12	15	15	10	14	13	8	13	12	7	11	10	6	10	9	5
			Exposed	17	17	17	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4
			Exposed	12	12	12	12	12	12	12	12	10	12	12	9	12	12	9	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	10	8	12	8	7	11	7	6	10	6	5	9	5	4	8	5	4
			Exposed	12	12	12	12	12	10	12	11	9	12	10	8	12	9	7	12	8	7	12	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	16	16	16	16	16	16	16	16	14	16	16	13	16	16	12	16	16	11	16	14	10	16	12	8	15	10	7	14	9	6	13	8	5	12	7	4	10	6	4
			Exposed	16	16	12	16	15	10	16	14	9	16	12	8	16	11	7	16	10	7	16	9	6	13	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	18	18	18	18	18	18	18	18	18	18	18	16	18	18	15	17	17	13	17	17	12	15	15	10	14	13	8	12	11	7	11	10	6	10	8	5	8	7	4
			Exposed	18	18	15	18	18	13	18	17	11	17	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
40	B	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	5
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	10	6	5	8	5	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	13	12	8	12	10	7	12	8	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	11	8	13	10	7	13	9	6	13	7	5	11	7	4
		27-45	Interior	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	14	13	13	13	11	13	13	9	12	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	11	15	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	7	9	8	6	9	7	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	12	8	12	11	7	12	9	6	11	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	13	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	12	13	13	10	12	12	8	11	11	7	11	10	6	10	9	5
			Exposed	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4
			Exposed	11	11	11	11	11	11	11	11	10	11	11	9	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	8	7	10	7	6	10	6	5	9	5	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2	4	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	12	8	13	10	7	12	9	6	11	8	5	11	7	4	10	6	4
			Exposed	14	14	12	14	14	10	14	14	9	14	12	8	14	11	7	14	10	7	14	9	6	13	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	13	15	15	12	14	14	10	13	13	8	12	11	7	11	10	6	10	8	5	8	7	4
			Exposed	16	16	15	16	16	13	16	16	11	16	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
50	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	10	10	7	9	9	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	11	7	5	10	7	4
		27-45	Interior	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	12	12	12	12	11	11	11	9	11	11	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	9	12	12	8	12	11	6	11	9	6	9	8	5			
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	8	8	6	8	7	5	8	6	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	6	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	11	11	7	10	9	6	10	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	9	6	11	8	5	11	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	12	12	10	11	11	8	10	10	7	10	10	6	9	9	5
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	12	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	8	7	9	7	6	8	6	5	8	5	4	8	5	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	7	10	9	7	9	7	5	8	6	4	8	6	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	8	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	9	6	12	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	12	12	12	10	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	13	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	7	4	7	7	4
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	7	4
		27-45	Interior	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	11	11	11	11	11	11	10	10	9	10	10	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	11	11	8	11	11	6	10	9	6	9	8	5
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	9	6	9	8	5	9	8	5	8	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	9	6	4	9	5	3	8	5	3
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	10	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	11	11	7	10	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	7	6	5	7	5	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	9	7	4	8	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
70	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	7	4	8	7	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	9	9	6	9	9	6	9	8	5
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4	6	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	7	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	6	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5	7	5	4	6	4	3	5	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	8	4	3	7	4	2	6	4	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	9	9	8	9	9	7	8	8	6	8	8	5	7	7	4	4
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	4	7	7	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	6	8	8	5
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	5	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	8	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	3	5	4	3	5	3	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	8	4	8	6	4	7	5	3	7	4	3	7	4	2	6	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	7	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	7	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	6	8	8	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	5	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	6	5	3	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	6	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	3	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	7	7	6	7	7	5	7	7	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	6	7	7	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	5	3	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	4	3	5	3	3	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	6	4	3	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	6	7	7	5	6	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	41	50	50	38	50	45	32	50	38	27	46	33	23	40	29	20	35	25	18	31	22	16
			Exposed	50	50	45	50	50	40	50	50	36	50	46	32	50	42	29	50	38	27	48	35	24	40	29	21	34	25	18	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	50	50	50	50	50	50	50	50	49	50	50	44	50	48	40	50	44	36	50	40	33	50	34	28	45	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	50	48	40	50	43	35	50	38	32	50	35	28	48	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	50	51	51	44	51	51	39	51	49	34	51	41	28	51	35	24	51	30	20	45	26	18	40	23	16	35	20	14
			Exposed	51	51	44	51	51	37	51	47	33	51	42	29	51	38	26	51	34	23	51	31	21	46	27	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	49	52	52	44	52	51	36	49	44	30	42	38	25	37	33	21	32	29	18	29	26	16
			Exposed	52	52	52	52	52	48	52	52	42	52	52	37	52	47	33	48	43	29	44	39	27	37	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	50	50	49	50	50	43	50	50	39	50	50	35	50	45	31	50	41	29	50	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	50	45	31	50	40	28	49	36	25	44	32	23	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	50	50	43	50	46	38	50	41	34	50	37	31	50	34	28	47	31	25	43	28	23	36	24	19	31	20	17	27	17	14	23	15	13	20	13	11	18	12	10
			Exposed	50	33	28	46	30	25	41	27	22	37	24	20	34	22	18	31	20	16	28	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	51	51	48	51	51	41	51	50	36	51	45	31	51	41	28	51	37	25	51	34	23	49	29	19	42	24	17	36	21	14	32	18	12	28	16	11	25	14	10
			Exposed	51	41	27	51	36	25	51	32	22	50	29	20	46	26	18	41	24	16	38	22	15	32	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	52	52	52	52	52	52	52	52	46	52	52	40	52	51	36	52	46	32	47	42	29	40	36	24	34	31	20	30	26	17	26	23	14	23	20	12	20	18	11
			Exposed	52	51	36	51	45	31	45	41	27	41	37	24	37	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	50	50	40	50	50	36	50	46	32	50	41	29	50	37	26	47	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	50	37	26	46	33	23	41	30	21	37	27	19	34	24	17	30	22	16	28	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	50	43	36	50	38	32	50	34	28	48	31	26	43	28	23	39	26	21	36	23	19	30	20	16	26	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	21	34	22	18	31	20	17	28	18	15	26	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	51	51	38	51	47	33	51	42	28	51	38	25	51	34	23	51	31	21	49	28	19	41	24	16	35	20	14	30	18	12	26	15	10	23	14	9	21	12	8
			Exposed	51	34	23	51	30	21	47	27	18	42	24	17	38	22	15	35	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	52	52	48	52	52	42	52	52	37	52	47	33	48	43	29	43	39	26	40	35	23	33	30	19	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	47	42	29	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
10	B	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	32	27	35	33	23	35	29	20	35	25	18	31	22	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	32	35	35	29	35	35	27	35	35	24	35	29	21	34	25	18	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	34	28	36	29	24	36	25	21	33	22	18	29	19	16	26	17	14
			Exposed	36	36	36	36	36	35	36	36	32	36	35	28	36	31	26	36	28	23	36	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	39	47	47	34	47	41	28	47	35	24	47	30	20	45	26	18	40	23	16	35	20	14
			Exposed	47	47	44	47	47	37	47	47	33	47	42	29	47	38	26	47	34	23	47	31	21	46	27	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	44	50	50	36	49	44	30	42	38	25	37	33	21	32	29	18	29	26	16
			Exposed	50	50	50	50	50	48	50	50	42	50	50	37	50	47	33	48	43	29	44	39	27	37	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	29	35	35	26	35	31	22	35	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	35	35	31	35	35	28	35	35	25	35	32	23	35	29	20	35	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	36	36	36	36	36	36	36	36	34	36	36	31	36	34	28	36	31	25	36	28	23	36	24	19	31	20	17	27	17	14	23	15	13	20	13	11	18	12	10
			Exposed	36	33	28	36	30	25	36	27	22	36	24	20	34	22	18	31	20	16	28	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	47	47	47	47	47	41	47	47	36	47	45	31	47	41	28	47	37	25	47	34	23	47	29	19	42	24	17	36	21	14	32	18	12	28	16	11	25	14	10
			Exposed	47	41	27	47	36	25	47	32	22	47	29	20	46	26	18	41	24	16	38	22	15	32	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	50	50	50	50	50	50	50	50	46	50	50	40	50	50	36	50	46	32	47	42	29	40	36	24	34	31	20	30	26	17	26	23	14	23	20	12	20	18	11
			Exposed	50	50	36	50	45	31	45	41	27	41	37	24	37	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	35	35	35	35	35	35	35	35	32	35	35	29	35	35	26	35	34	24	35	31	22	35	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	35	35	26	35	33	23	35	30	21	35	27	19	34	24	17	30	22	16	28	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	36	36	36	36	36	32	36	34	28	36	31	26	36	28	23	36	26	21	36	23	19	30	20	16	26	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	36	28	23	36	25	21	34	22	18	31	20	17	28	18	15	26	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	48	48	38	48	47	33	48	42	28	48	38	25	48	34	23	48	31	21	48	28	19	41	24	16	35	20	14	30	18	12	26	15	10	23	14	9	21	12	8
			Exposed	48	34	23	48	30	21	47	27	18	42	24	17	38	22	15	35	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	51	51	48	51	51	42	51	51	37	51	47	33	48	43	29	43	39	26	40	35	23	33	30	19	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	47	42	29	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
20	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	18	24	22	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	21	15	24	19	13	23	16	12	20	15	10
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	24	25	25	21	25	22	18	24	19	16	23	17	14
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	22	18	25	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	28	37	35	24	37	30	20	37	26	18	37	23	16	35	20	14
			Exposed	37	37	37	37	37	37	37	37	33	37	37	29	37	37	26	37	34	23	37	31	21	37	27	18	37	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	36	41	41	30	38	38	25	35	33	21	32	29	18	29	26	16
			Exposed	41	41	41	41	41	41	41	41	41	41	41	37	41	41	33	41	41	29	41	39	27	37	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	12	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	24	19	25	20	17	24	17	14	22	15	13	20	13	11	18	12	10
			Exposed	25	25	25	25	25	25	25	25	22	25	24	20	25	22	18	25	20	16	25	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	37	37	37	37	37	37	37	37	36	37	37	31	37	37	28	37	37	25	37	34	23	37	29	19	37	24	17	35	21	14	32	18	12	28	16	11	25	14	10
			Exposed	37	37	27	37	36	25	37	32	22	37	29	20	37	26	18	37	24	16	37	22	15	32	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	41	41	41	41	41	41	41	41	41	41	41	40	41	41	36	41	41	32	40	40	29	37	36	24	34	31	20	30	26	17	26	23	14	23	20	12	20	18	11
			Exposed	41	41	36	41	41	31	41	41	27	41	37	24	37	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	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	22	16	24	19	14	23	17	12	20	15	10	18	13	9
			Exposed	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	16	24	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	23	19	24	20	16	23	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	25	25	23	25	25	21	25	22	18	25	20	17	25	18	15	25	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	38	38	38	38	38	33	38	38	28	38	38	25	38	34	23	38	31	21	38	28	19	38	24	16	35	20	14	30	18	12	26	15	10	23	14	9	21	12	8
			Exposed	38	34	23	38	30	21	38	27	18	38	24	17	38	22	15	35	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	42	42	42	42	42	42	42	42	37	42	42	33	42	42	29	40	39	26	38	35	23	33	30	19	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	42	42	29	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	21	15	24	19	13	23	16	12	20	15	10
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	21	25	22	18	24	19	16	23	17	14
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	22	18	25	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	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	20	30	26	18	30	23	16	28	20	14			
			Exposed	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	30	23	30	30	21	30	27	18	30	23	15	30	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	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	30	32	32	25	30	30	21	29	29	18	27	26	16
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	29	34	34	27	34	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	12	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7			
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	24	19	25	20	17	24	17	14	22	15	13	20	13	11	18	12	10
			Exposed	25	25	25	25	25	25	25	25	22	25	24	20	25	22	18	25	20	16	25	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	30	23	30	29	19	30	24	17	29	21	14	27	18	12	26	16	11	24	14	10
			Exposed	30	30	27	30	30	25	30	30	22	30	29	20	30	26	18	30	24	16	30	22	15	30	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	29	31	31	24	29	29	20	27	26	17	25	23	14	23	20	12	20	18	11
			Exposed	34	34	34	34	34	31	34	34	27	34	34	24	34	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	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	22	16	24	19	14	23	17	12	20	15	10	18	13	9
			Exposed	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	16	24	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	23	19	24	20	16	23	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	25	25	23	25	25	21	25	22	18	25	20	17	25	18	15	25	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	32	32	32	32	32	32	32	32	28	32	32	25	32	32	23	32	31	21	32	28	19	32	24	16	30	20	14	28	18	12	26	15	10	23	14	9	21	12	8
			Exposed	32	32	23	32	30	21	32	27	18	32	24	17	32	22	15	32	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	36	36	36	36	36	36	36	36	36	36	36	33	36	36	29	34	34	26	33	33	23	30	30	19	28	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	36	36	29	36	36	25	36	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
40	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	16
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	19	13	20	16	12	20	15	10
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	20	19	15	20	17	14
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	19	15	21	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	26	18	25	23	16	24	20	14			
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	21	26	26	18	26	23	15	26	20	13	26	17	12	25	15	10	23	13	9
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	25	27	27	21	25	25	18	24	24	16
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	27	30	30	22	30	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	16	20	20	14	20	18	12	20	16	11
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	14	20	17	12	20	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	20	17	20	17	14	19	15	13	18	13	11	17	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	20	16	21	18	15	21	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	26	19	26	24	17	24	21	14	23	18	12	22	16	11	21	14	10
			Exposed	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	24	16	26	22	15	26	19	13	26	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	27	27	24	26	26	20	24	24	17	23	23	14	21	20	12	20	18	11
			Exposed	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	30	19	29	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	16	21	21	16	21	19	14	21	17	12	20	15	10	18	13	9
			Exposed	21	21	21	21	21	21	21	21	21	21	21	19	21	21	17	21	21	16	21	20	14	21	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	20	16	21	17	14	20	15	12	19	13	10	17	11	9	15	10	8
			Exposed	22	22	22	22	22	21	22	22	18	22	20	17	22	18	15	22	17	14	22	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	27	19	27	24	16	26	20	14	24	18	12	23	15	10	22	14	9	20	12	8
			Exposed	27	27	23	27	27	21	27	27	18	27	24	17	27	22	15	27	20	14	27	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	30	30	26	29	29	23	27	27	19	25	25	16	23	22	14	22	19	12	19	17	10	17	15	9
			Exposed	31	31	29	31	31	25	31	31	22	31	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
50	B	0-7	Interior	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	16	16	16	16
			Exposed	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	12	16	15	10
		7-20	Interior	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	17	17	17	16	17	17	14	17	17	14
			Exposed	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	15	17	16	13	17	14	12	17	12	10	17	11	9
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	22	16	21	20	14			
			Exposed	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	15	22	20	13	22	17	12	22	15	10	21	13	9
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	25	24	24	21	23	23	18	21	21	16
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	18	25	25	15	24	21	13	21	19	12	19	17	10			
	C	0-7	Interior	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	16	16	11
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	12	16	15	11	16	16	13	16	13	9	16	12	8	14	10	7
		7-20	Interior	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	14	16	15	13	16	13	11	15	12	10
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	17	15	13	17	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	17	21	21	14	20	18	12	19	16	11	18	14	10			
			Exposed	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	22	16	22	22	15	22	19	13	22	16	11	21	14	9	20	12	8	18	11	7	16	9	6
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	24	24	23	23	20	22	22	17	21	21	14	19	19	12	18	18	11	
			Exposed	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	19	26	26	17	24	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	18	14	18	17	12	18	15	10	18	13	9	18	13	9
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	16	18	18	14	18	17	12	18	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	16	18	17	14	17	15	12	17	13	10	16	11	9	15	10	8
			Exposed	19	19	19	19	19	19	19	19	18	19	19	17	19	18	15	19	17	14	19	15	13	19	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	19	24	24	16	22	20	14	21	18	12	20	15	10	19	14	9	18	12	8
			Exposed	24	24	23	24	24	21	24	24	18	24	24	17	24	22	15	24	20	14	24	18	13	24	16	11	22	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	26	26	26	23	24	24	19	23	23	16	21	21	14	20	19	12	19	17	10	17	15	9
			Exposed	28	28	28	28	28	25	28	28	22	28	28	20	27	27	18	27	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 1.25	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
		20-27	Interior	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	13
			Exposed	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	13	13	10	13	13	9	13	13	9
		27-45	Interior	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	16	16	16	16	16	15	15	15	15
			Exposed	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	15	16	16	13	16	16	12	15	15	10
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6
		20-27	Interior	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	13	13	11	13	13	10
			Exposed	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	11	13	13	9	13	12	8	13	11	7	13	9	6
		27-45	Interior	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	16	16	15	15	15	15	15	14	14	14	12	14	14	11
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	14	16	16	12	15	15	11	15	15	9	14	13	8	13	12	7						
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6
		7-20	Interior	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	10	11	11	9	10	10	8	
			Exposed	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	9	11	9	8	11	8	7	11	7	6	10	6	5	
		20-27	Interior	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	14	14	12	14	14	10	13	13	9	13	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	13	9	14	11	8	14	10	7	13	9	6	13	8	5
		27-45	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	17	17	17	16	16	16	16	16	14	15	15	12	14	14	10	13	13	9
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	18	18	16	18	18	14	17	17	12	16	16	10	16	14	9	14	13	8	12	11	7	11	10	6
100	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		20-27	Interior	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	12	12	12	12
			Exposed	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	10	12	12	9			
		27-45	Interior	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	14	14			
			Exposed	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	12	14	14	10						
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6			
		20-27	Interior	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	11	12	12	10			
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	11	7	12	9	6			
		27-45	Interior	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	14	14	14	14	14	13	13	12	13	13	11			
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	12	14	14	11	14	14	9	13	13	8	13	12	7						
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6			
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8				
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	10	6	5			
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	12	12	9	12	12	8						
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	9	13	11	8	13	10	7	12	9	6	12	8	5						
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	15	15	15	15	15	14	14	14	12	13	13	10	13	13	9				
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	16	16	12	15	15	10	15	14	9	14	13	8	12	11	7	11	10	6		

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6		
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8		
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	7	5
		20-27	Interior	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	11	12	12	9	11	11	8						
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	11	8	5
		27-45	Interior	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	13	13	13	13	13	12	12	11	12	12	10
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	11	13	13	9	13	13	8	12	11	7	11	10	6			
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7			
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4			
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	8	8	7	8	7	6			
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	6	9	7	6	9	6	5	8	5	4	7	4	4
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	11	11	9	11	11	7	10	10	7	10	9	6			
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	11	8	12	10	6	11	8	5	11	7	5	10	6	4	10	5	4
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	12	12	12	10	11	11	8	11	11	7	10	10	7
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	10	13	13	9	13	12	7	12	10	6	10	9	5	9	8	5	8	7	4
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5						
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	9	7	5	9	7	5	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	8	6	8	7	5	8	6	5			
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	12	12	8	11	11	7	11	9	6	10	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	12	8	5	11	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	14	14	14	13	13	12	12	12	10	12	12	8	11	11	7	10	10	6	10	9	5
			Exposed	15	15	15	15	15	15	15	15	13	15	15	12	15	15	11	14	14	9	14	14	8	13	12	7	11	10	6	10	9	5	8	8	4	7	7	4	7	6	3
70	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5			
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8						
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5			
		27-45	Interior	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	12	12	12	12	12	11	11	11	11	11	10
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	12	12	9	12	12	8	11	11	7	11	10	6			
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	7	5	7	6	4			
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	7	4	4			
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	10	8	5	9	6	4	9	5	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	10	8	5	10	7	5	9	6	4	9	5	4
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	11	11	11	11	11	10	10	10	9	10	10	7	9	9	7	9	9	7
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	10	12	12	9	11	11	7	11	10	6	10	9	5	9	8	5	8	7	4			
	D	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5			
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	7	5	8	6	4	7	5	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	7	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	10	10	7	10	9	6	9	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	9	6	11	8	5	10	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	13	13	13	13	12	12	12	11	11	10	11	11	8	10	10	7	10	10	6	9	9	5
			Exposed	14	14	14	14	14	14	14	14	13	14	14	12	13	13	11	13	13	9	13	13	8	12	12	7	11	10	6	10	9	5	8	8	4	7	7	4	7	6	3
80	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5			
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5			
		27-45	Interior	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	10	10	10	10	10	10
			Exposed	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	9	11	11	8	10	10	7	10	10	6			
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6			
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4			
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	6	5	7	5	4	6	4	4			
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	8	8	7	8	8	6			
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	7	5	8	6	4	8	5	4			
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	10	9	7	9	9	7			
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	10	10	7	10	10	6	10	9	5	9	8	5	8	7	4
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3			
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5			
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	5	4	7	4	3	6	4	3			
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	9	6	9	8	5	8	7	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	9	6	4	9	5	3	8	5	3
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	11	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	11	11	7	11	10	6	10	9	5	8	8	4	7	7	4	7	6	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	9	6
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	4	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	5	8	7	5	8	6	4	8	5	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	5	8	8	5	8	7	4	8	7	4
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5	8	7	5	8	7	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	5	8	6	4	8	5	3	8	5	3	8	5	3
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	9	9	8	9	9	7	8	8	6	8	8	5	8
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	10	10	7	10	10	6	9	9	5	8	8	4	7	7	4	7	6	3
100	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	8	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	5	8	8	5	8	7	4	8	7	4
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	3	5	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	7	5	3	7	5	3	7	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	6	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	9	5	8	8	4	7	7	4	7	6	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

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ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
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SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	23	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	22	15	24	19	14	23	17	12	21	15	11
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	21	25	22	18	25	20	16	24	17	14
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	22	25	22	18	25	19	16	25	17	14	22	14	12	20	13	10	17	11	9
		20-27	Interior	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	21	31	27	18	31	24	16	29	21	14
			Exposed	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	31	24	31	31	22	31	27	18	31	23	16	31	20	14	30	17	12	26	15	10	23	14	9
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	33	33	26	31	31	22	29	29	19	28	26	16
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	30	35	35	27	35	34	22	33	29	19	28	25	16	25	22	13	22	19	12	19	17	10
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	19	24	24	17	24	21	15	24	18	13	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	21	15	24	18	13	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	24	20	25	21	17	24	18	15	23	16	13	21	14	11	19	12	10
			Exposed	25	25	25	25	25	25	25	25	23	25	25	20	25	22	18	25	20	17	25	19	15	24	16	13	21	13	11	18	12	10	16	10	8	14	9	7	12	8	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	26	31	31	23	31	29	20	31	25	17	29	22	15	28	19	13	26	17	11	25	15	10
			Exposed	31	31	28	31	31	25	31	31	22	31	30	20	31	27	18	31	25	17	31	22	15	31	19	13	28	16	11	24	14	10	21	12	8	18	11	7	16	10	6
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	32	32	24	30	30	20	28	27	17	26	24	14	23	21	13	21	18	11
			Exposed	35	35	35	35	35	32	35	35	28	35	35	25	35	34	22	34	31	20	32	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	14	8	13	12	7
	D	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	22	25	25	19	25	23	16	25	20	14	24	17	12	21	15	11	18	13	9
			Exposed	25	25	25	25	25	24	25	25	21	25	25	19	25	25	17	25	23	16	25	21	15	24	17	12	20	15	10	18	13	9	15	11	8	14	10	7	12	9	6
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	22	25	24	20	25	20	17	24	17	14	23	15	12	20	13	11	18	11	9	16	10	8
			Exposed	25	25	24	25	25	21	25	23	19	25	21	17	25	19	15	25	17	14	24	16	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	7	5
		20-27	Interior	33	33	33	33	33	33	33	33	29	33	33	26	33	33	24	33	32	21	33	29	20	33	24	17	31	21	14	29	18	12	27	16	11	24	14	9	21	12	8
			Exposed	33	33	24	33	31	21	33	28	19	33	25	17	33	23	15	33	21	14	32	19	13	27	16	11	23	14	9	20	12	8	18	10	7	15	9	6	14	8	5
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	33	36	36	30	35	35	27	34	34	24	31	31	20	29	26	16	25	23	14	22	20	12	19	17	11	17	15	9
			Exposed	37	37	30	37	37	26	37	35	23	35	31	20	32	28	18	29	26	16	26	24	15	22	20	12	19	17	10	17	15	9	14	13	8	13	11	7	11	10	6
40	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	16
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	19	14	20	17	12	20	15	11
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	20	16	20	17	14
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	19	16	21	17	14	21	14	12	20	13	10	17	11	9
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	21	26	26	18	26	26	18	26	24	16	25	21	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	18	26	23	16	26	20	14	26	17	12	26	15	10	23	14	9
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	26	27	27	22	26	26	19	24	24	16
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27	30	30	22	30	29	19	28	25	16	25	22	13	22	19	12	19	17	10
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	15	20	18	13	20	16	11
			Exposed	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	18	13	20	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	17	20	18	15	19	16	13	19	14	11	18	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	20	17	21	19	15	21	16	13	21	13	11	18	12	10	16	10	8	14	9	7	12	8	6
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	20	26	25	17	25	22	15	24	19	13	23	17	11
			Exposed	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	25	17	26	22	15	26	19	13	26	16	11	24	14	10	21	12	8	18	11	7	16	10	6
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	24	26	26	20	25	25	17	23	23	14	22	21	13	20	18	11
			Exposed	30	30	30	30	30	30	30	30	28	30	30	25	30	30	22	30	30	20	30	28	18	27	24	15	23	20	12	20	18	11	17	15	9	15	14	8	13	12	7
	D	0-7	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	16	22	20	14	22	17	12	21	15	11	18	13	9
			Exposed	22	22	22	22	22	22	22	22	21	22	22	19	22	22	17	22	22	16	22	21	15	22	17	12	20	15	10	18	13	9	15	11	8	14	10	7	12	9	6
		7-20	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	20	17	22	17	14	21	15	12	20	13	11	18	11	9	16	10	8
			Exposed	23	23	23	23	23	21	23	23	19	23	21	17	23	19	15	23	17	14	23	16	13	20	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	7	5
		20-27	Interior	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	21	28	28	20	28	24	17	26	21	14	25	18	12	23	16	11	22	14	9	21	12	8
			Exposed	28	28	24	28	28	21	28	28	19	28	25	17	28	23	15	28	21	14	28	19	13	27	16	11	23	14	9	20	12	8	18	10	7	15	9	6	14	8	5
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	31	31	27	30	30	24	27	27	20	26	26	16	24	23	14	22	20	12	19	17	11	17	15	9
			Exposed	32	32	30	32	32	26	32	32	23	32	31	20	32	28	18	29	26	16	26	24	15	22	20	12	19	17	10	17	15	9	14	13	8	13	11	7	11	10	6
50	B	0-7	Interior	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	16	16	16	16
			Exposed	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	14	16	16	12	16	15	11
		7-20	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	17	17	14
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	17	14	18	14	12	18	13	10	17	11	9
		20-27	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21	23	23	18	22	22	16	21	21	14
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	18	23	23	16	23	20	14	23	17	12	22	15	10	21	14	9
		27-45	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	25	25	24	24	22	23	23	19	22	22	16
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	19	25	25	16	24	22	13	22	19	12	19	19	12	19	17	10
	C	0-7	Interior	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	15	16	16	13	16	16	11
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	13	16	15	11	16	16	13	16	16	9	16	12	8	14	10	7
		7-20	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	17	17	15	17	16	13	16	14	11	15	12	10
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	16	13	18	13	11	17	12	10	16	10	8	14	9	7	12	8	6
		20-27	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	20	23	23	17	22	22	15	21	19	13	20	17	11	19	15	10
			Exposed	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	23	17	23	22	15	23	19	13	23	16	11	22	14	10	21	12	8	18	11	7	16	10	6
		27-45	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	26	26	25	25	24	24	24	20	22	22	17	21	21	14	20	20	13	19	18	11
			Exposed	27	27	27	27	27	27	27	27	27	27	27	25	27	27	22	27	27	20	26	26	18	25	24	15	23	20	12	20	18	11	17	15	9	15	14	8	13	12	7
	D	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	18	14	18	17	12	18	15	11	18	13	9	16	13	9
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	16	18	18	15	18	17	12	18	15	10	18	13	9	15	11	8	14	10	7	12	9	6
		7-20	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	19	17	19	17	14	18	15	12	17	13	11	16	11	9	16	10	8
			Exposed	20	20	20	20	20	20	20	20	19	20	20	17	20	19	15	20	17	14	20	16	13	19	13	11	17	11	9	15	10	8	13	8	7	11	7	6	10	7	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	20	24	24	17	23	21	14	22	18	12	21	16	11	20	14	9	19	12	8
			Exposed	24	24	24	24	24	21	24	24	19	24	24	17	24	23	15	24	21	14	24	19	13	24	16	11	23	14	9	20	12	8	18	10	7	15	9	6	14	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	26	26	24	25	25	20	23	23	16	22	22	14	20	20	12	19	17	11	17	15	9
			Exposed	28	28	28	28	28	26	28	28	23	28	28	20	28	28	18	27	26	16	26	24	15	22	20	12	19	17	10	17	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	19 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

Maximum Allowable 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
90	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
		20-27	Interior	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	14
			Exposed	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	12	14	14	9
		27-45	Interior	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	17	17	16	16	16	16	16	16	16	16
			Exposed	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	17	17	16	16	12	16	16	10	16	16
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	10	8
		20-27	Interior	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	13	13	11	13	13
			Exposed	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	11	14	14	10	14	12	8	13	11	7	13	10	6
		27-45	Interior	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	16	16	16	16	16	15	15	14	14	14	13	14	14	11
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	16	16	12	16	16	11	15	15	9	14	14	8	13	12	7						
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6			
		7-20	Interior	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	9	11	10	8			
			Exposed	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	9	11	10	8	11	8	7	11	7	6	10	7	5
		20-27	Interior	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	14	14	11	14	14	9	13	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	14	9	15	12	8	14	10	7	14	9	6	13	8	5
		27-45	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	17	17	16	16	16	14	15	15	12	14	14	11	14	14	9
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	16	18	18	15	18	18	12	17	17	10	16	15	9	14	13	8	13	11	7	11	10	6
100	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		20-27	Interior	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	12	12	12	12
			Exposed	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	10	12	12	9
		27-45	Interior	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	15	15	15	15	15	15
			Exposed	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	13	15	15	12	15	15	10
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6
		20-27	Interior	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	11	12	12	10
			Exposed	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	11	12	12	10	12	12	8	12	11	7	12	10	6
		27-45	Interior	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	15	15	15	15	15	14	14	14	14	14	13	13	13	11
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	12	15	15	11	14	14	9	14	14	8	13	12	7
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6			
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8			
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	10	9	6	10	8	7	10	7	6	10	7	5
		20-27	Interior	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	12	13	13	11	13	13	9	12	12	8
			Exposed	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	14	11	14	14	9	14	12	8	13	10	7	13	9	6	12	8	5			
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	16	16	16	15	15	14	14	14	12	14	14	11	13	13	9
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	16	16	12	16	16	10	15	15	9	14	13	8	13	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	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	10	12	12	9	12	11	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	9	12	11	8	12	9	7	11	8	6	10	7	5
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	12	10	12	12	10	12	11	9	12	10	8	12	8	7
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	11	9	12	9	8	12	8	7	11	7	6	10	6	5	8	5	4
		20-27	Interior	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	10	15	13	9	15	12	8	14	10	7
			Exposed	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	12	15	15	11	15	13	9	15	11	8	15	10	7	15	9	6	13	7	5	11	7	4
		27-45	Interior	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	15	16	16	13	15	15	11	14	14	9	14	13	8
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	17	17	13	17	17	11	16	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	10	7	12	9	6	11	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	10	7	12	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	12	10	8	12	9	7	11	8	6	10	7	5	9	6	5
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	11	9	12	10	8	12	9	7	12	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	12	15	14	10	15	12	8	15	11	7	14	9	6	13	8	5	12	7	5
			Exposed	15	15	14	15	15	12	15	15	11	15	15	10	15	13	9	15	12	8	15	11	7	15	9	6	14	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	16	16	12	15	15	10	14	13	8	13	12	7	11	10	6	10	9	5
			Exposed	17	17	17	17	17	16	17	17	14	17	17	12	17	17	11	17	15	10	16	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4
			Exposed	12	12	12	12	12	12	12	12	10	12	12	9	12	12	9	12	11	8	12	10	7	12	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	10	8	12	8	7	11	7	6	10	6	5	9	5	4	8	5	4
			Exposed	12	12	12	12	12	10	12	11	9	12	10	8	12	9	7	12	8	7	12	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	16	16	16	16	16	16	16	16	14	16	16	13	16	16	12	16	16	11	16	14	10	16	12	8	15	10	7	14	9	6	13	8	5	12	7	4	10	6	4
			Exposed	16	16	12	16	15	10	16	14	9	16	12	8	16	11	7	16	10	7	16	9	6	13	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	18	18	18	18	18	18	18	18	18	18	18	16	18	18	15	17	17	13	17	17	12	15	15	10	14	13	8	12	11	7	11	10	6	10	8	5	8	7	4
			Exposed	18	18	15	18	18	13	18	17	11	17	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
40	B	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	7	5
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	8	7
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	10	6	5	8	5	4
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	10	13	13	9	13	12	8	12	10	7	12	8	6
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	9	13	11	8	13	10	7	13	9	6	13	7	5	11	7	4
		27-45	Interior	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	14	13	13	13	11	13	13	9	12	12	8
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	15	15	11	15	14	9	14	12	8	12	11	6	11	9	6	9	8	5
	C	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	6	4	8	6	4	7	5	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	9	7	9	8	6	9	7	5	9	6	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6	10	6	5	9	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	12	8	13	11	7	12	9	6	11	8	5	10	7	5
			Exposed	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	13	12	8	13	11	7	13	9	6	13	8	5	12	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	12	13	13	10	12	12	8	11	11	7	11	10	6	10	9	5
			Exposed	15	15	15	15	15	15	15	15	14	15	15	12	15	15	11	15	15	10	15	14	9	13	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4
			Exposed	11	11	11	11	11	11	11	11	10	11	11	9	11	11	9	11	11	8	11	10	7	11	8	6	10	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	8	11	8	7	10	7	6	10	6	5	9	5	4	8	5	4
			Exposed	11	11	11	11	11	10	11	11	9	11	10	8	11	9	7	11	8	7	11	8	6	10	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	14	14	14	14	14	14	14	14	14	14	14	13	14	14	12	14	14	11	14	14	10	14	12	8	13	10	7	12	9	6	11	8	5	11	7	4	10	6	4
			Exposed	14	14	12	14	14	10	14	14	9	14	12	8	14	11	7	14	10	7	14	9	6	13	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	13	15	15	12	14	14	10	13	13	8	12	11	7	11	10	6	10	8	5	8	7	4
			Exposed	16	16	15	16	16	13	16	16	11	16	15	10	16	14	9	14	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
50	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	8	7	9	7	6	9	6	5	8	5	4
		20-27	Interior	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	10	11	11	9	11	11	8	10	10	7	9	9	7
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	11	8	11	10	7	11	9	6	11	7	5	10	7	4
		27-45	Interior	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	12	12	12	12	11	11	11	9	11	11	8
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	9	12	12	8	12	11	6	11	9	6	9	8	5			
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	7	5	8	6	4
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	7	8	8	6	8	7	5	8	6	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	6	5	8	6	5	8	5	4	7	4	3	6	4	3
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	8	11	11	7	10	9	6	10	8	5	9	7	5
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	9	6	11	8	5	11	7	5	10	6	4	9	5	3	8	5	3
		27-45	Interior	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	12	12	10	11	11	8	10	10	7	10	10	6	9	9	5
			Exposed	13	13	13	13	13	13	13	13	13	13	13	12	13	13	11	13	13	10	13	13	9	12	12	7	11	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	8	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6	9	7	5	9	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	8	9	8	7	9	7	6	8	6	5	8	5	4	8	5	4
			Exposed	10	10	10	10	10	10	10	10	9	10	10	8	10	10	8	10	9	7	10	9	6	9	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	8	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4
			Exposed	12	12	12	12	12	10	12	12	9	12	12	8	12	11	7	12	10	7	12	9	6	12	8	5	11	7	4	10	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	12	12	12	10	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4
			Exposed	14	14	14	14	14	13	14	14	11	14	14	10	14	14	9	13	13	8	13	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
60	B	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	5	4	7	6	4
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	9	9	7	9	8	6
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	7	5	9	7	4
		27-45	Interior	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	11	11	11	11	11	11	10	10	9	10	10	8
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	11	11	8	11	11	6	10	9	6	9	8	5
	C	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	7	7	5	7	6	4	7	6	4	7	5	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	7	6	5	7	5	4	7	4	3	6	4	3
		20-27	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	9	9	7	9	9	6	9	8	5	9	8	5	8	5	3
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6	10	8	5	9	7	5	9	6	4	9	5	3	8	5	3
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	10	10	10	10	8	9	9	7	9	9	6	8	8	5
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	11	11	7	10	10	6	10	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	4	7	5	3	6	4	3
		7-20	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	7	6	7	6	5	7	5	4	7	5	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	7	8	8	6	8	6	5	8	5	4	7	5	4	6	4	3	5	3	3	5	3	2
		20-27	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	9	7	4	8	6	4
			Exposed	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	11	10	7	11	9	6	10	8	5	10	7	4	9	6	4	9	5	3	8	4	3	7	4	2
		27-45	Interior	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	10	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4
			Exposed	12	12	12	12	12	12	12	12	11	12	12	10	12	12	9	12	12	8	12	12	7	11	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
70	B	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	7	5	8	7	4
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	6	9	9	6	9	8	5	8	7	5
	C	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	6	4	6	5	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	5	4	6	4	3	6	4	3	6	4	3
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	6	4	8	5	3	7	5	3
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	8	7	5	8	6	4	8	5	3	7	5	3
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	9	9	7	8	8	6	8	8	5
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	7	9	9	6	9	9	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	5	3	6	4	3
		7-20	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6	5	6	5	4	6	5	4	6	5	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	6	4	7	5	3	6	4	3	5	4	3
		20-27	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	9	8	5	9	7	4	9	6	4	8	5	3	8	4	3	7	4	2	6	4	2
		27-45	Interior	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	9	9	8	9	9	7	8	8	6	8	8	5	7	7	4	4
			Exposed	11	11	11	11	11	11	11	11	11	11	11	10	11	11	9	11	11	8	11	11	7	10	10	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3
80	B	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	7	4
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	6	9	9	6	8	8	5
	C	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	5	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	7	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	7	5	3	7	5	3
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	5
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6	8	8	5	8	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3	5	4	3
		7-20	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	4	6	5	4
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	4	6	5	3	6	4	3	5	3	3	5	3	2
		20-27	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	7	7	5	7	7	4	7	6	4	7	6	4
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	6	8	8	5	8	7	4	7	5	3	7	4	3	7	4	2	6	4	2
		27-45	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	8	8	8	7	8	8	6	7	7	5	7	7	4
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	9	9	6	9	8	5	8	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	PORTRAIT	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																				
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	7	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	8	6	8	8	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	4	3	3
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	5	6	6	5
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	5	7	6	4	6	5	3	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	7	4	6	6	3
	D	0-7	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	3	5	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	7	5	3	7	4	3	6	4	2
		27-45	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	7	7	7	6	7	7	5	7	7	4
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	9	6	8	8	5	8	7	4	7	6	4	6	5	3	5	5	3
100	B	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	4	6	6	4
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	7	7	6	7	7	5
	C	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
		7-20	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		20-27	Interior	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	5
			Exposed	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	4	6	5	3	6	5	3	6	5	3
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	6	7	7	6	6	6	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3
	D	0-7	Interior	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Exposed	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3
		7-20	Interior	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4
			Exposed	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	5	3	3	5	3	2	5	3	2
		20-27	Interior	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	5	6	6	4	6	6	4
			Exposed	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	5	7	7	4	7	6	4	6	5	3	6	4	3	6	4	2
		27-45	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	6	7	7	5
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	8	8	6	8	8	5	7	7	4	7	6	4	6	5	3	5	5	3

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0	B	0-7	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	50	50	41	50	50	38	50	45	32	50	38	27	46	33	23	40	29	20	35	25	18	31	22	16
			Exposed	50	50	45	50	50	40	50	50	36	50	46	32	50	42	29	50	38	27	48	35	24	40	29	21	34	25	18	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	50	50	50	50	50	50	50	50	49	50	50	44	50	48	40	50	44	36	50	40	33	50	34	28	45	29	24	38	25	21	33	22	18	29	19	16	26	17	14
			Exposed	50	48	40	50	43	35	50	38	32	50	35	28	48	31	26	44	28	23	40	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	50	51	51	44	51	51	39	51	49	34	51	41	28	51	35	24	51	30	20	45	26	18	40	23	16	35	20	14
			Exposed	51	51	44	51	51	37	51	47	33	51	42	29	51	38	26	51	34	23	51	31	21	46	27	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	49	52	52	44	52	51	36	49	44	30	42	38	25	37	33	21	32	29	18	29	26	16
			Exposed	52	52	52	52	52	48	52	52	42	52	52	37	52	47	33	48	43	29	44	39	27	37	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	50	50	49	50	50	43	50	50	39	50	50	35	50	45	31	50	41	29	50	37	26	43	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	50	45	31	50	40	28	49	36	25	44	32	23	40	29	20	36	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	50	50	43	50	46	38	50	41	34	50	37	31	50	34	28	47	31	25	43	28	23	36	24	19	31	20	17	27	17	14	23	15	13	20	13	11	18	12	10
			Exposed	50	33	28	46	30	25	41	27	22	37	24	20	34	22	18	31	20	16	28	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	51	51	48	51	51	41	51	50	36	51	45	31	51	41	28	51	37	25	51	34	23	49	29	19	42	24	17	36	21	14	32	18	12	28	16	11	25	14	10
			Exposed	51	41	27	51	36	25	51	32	22	50	29	20	46	26	18	41	24	16	38	22	15	32	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	52	52	52	52	52	52	52	52	46	52	52	40	52	51	36	52	46	32	47	42	29	40	36	24	34	31	20	30	26	17	26	23	14	23	20	12	20	18	11
			Exposed	52	51	36	51	45	31	45	41	27	41	37	24	37	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	50	50	40	50	50	36	50	46	32	50	41	29	50	37	26	47	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	50	37	26	46	33	23	41	30	21	37	27	19	34	24	17	30	22	16	28	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	50	43	36	50	38	32	50	34	28	48	31	26	43	28	23	39	26	21	36	23	19	30	20	16	26	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	43	28	23	38	25	21	34	22	18	31	20	17	28	18	15	26	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	51	51	38	51	47	33	51	42	28	51	38	25	51	34	23	51	31	21	49	28	19	41	24	16	35	20	14	30	18	12	26	15	10	23	14	9	21	12	8
			Exposed	51	34	23	51	30	21	47	27	18	42	24	17	38	22	15	35	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	52	52	48	52	52	42	52	52	37	52	47	33	48	43	29	43	39	26	40	35	23	33	30	19	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	47	42	29	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
10	B	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	32	35	35	27	35	35	24	35	29	21	34	25	18	30	21	15	26	19	13	23	16	12
			Exposed	35	35	35	35	35	35	35	35	35	35	35	32	35	35	29	35	35	27	35	35	24	35	29	21	34	25	18	30	21	15	26	19	13	23	16	12	20	15	10
		7-20	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	28	36	34	24	36	25	21	33	22	18	29	19	16	26	17	14	23	17	14
			Exposed	36	36	36	36	36	35	36	36	32	36	35	28	36	31	26	36	28	23	36	26	21	34	22	18	29	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	39	47	47	34	47	41	28	47	35	24	47	30	20	45	26	18	40	23	16	35	20	14
			Exposed	47	47	44	47	47	37	47	47	33	47	42	29	47	38	26	47	34	23	47	31	21	46	27	18	39	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	44	50	50	36	49	44	30	42	38	25	37	33	21	32	29	18	29	26	16
			Exposed	50	50	50	50	50	48	50	50	42	50	50	37	50	47	33	48	43	29	44	39	27	37	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	31	35	35	29	35	35	26	35	31	22	35	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	35	35	31	35	35	28	35	35	25	35	32	23	35	29	20	35	26	19	33	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	36	36	36	36	36	36	36	36	34	36	36	31	36	34	28	36	31	25	36	28	23	36	24	19	31	20	17	27	17	14	23	15	13	20	13	11	18	12	10
			Exposed	36	33	28	36	30	25	36	27	22	36	24	20	34	22	18	31	20	16	28	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	47	47	47	47	47	41	47	47	36	47	45	31	47	41	28	47	37	25	47	34	23	47	29	19	42	24	17	36	21	14	32	18	12	28	16	11	25	14	10
			Exposed	47	41	27	47	36	25	47	32	22	47	29	20	46	26	18	41	24	16	38	22	15	32	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	50	50	50	50	50	50	50	50	46	50	50	40	50	50	36	50	46	32	47	42	29	40	36	24	34	31	20	30	26	17	26	23	14	23	20	12	20	18	11
			Exposed	50	50	36	50	45	31	45	41	27	41	37	24	37	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	35	35	35	35	35	35	35	35	32	35	35	29	35	35	26	35	34	24	35	31	22	35	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	35	35	26	35	33	23	35	30	21	35	27	19	34	24	17	30	22	16	28	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	36	36	36	36	36	32	36	34	28	36	31	26	36	28	23	36	26	21	36	23	19	30	20	16	26	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	36	28	23	36	25	21	34	22	18	31	20	17	28	18	15	26	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	48	48	38	48	47	33	48	42	28	48	38	25	48	34	23	48	31	21	48	28	19	41	24	16	35	20	14	30	18	12	26	15	10	23	14	9	21	12	8
			Exposed	48	34	23	48	30	21	47	27	18	42	24	17	38	22	15	35	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	51	51	48	51	51	42	51	51	37	51	47	33	48	43	29	43	39	26	40	35	23	33	30	19	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	47	42	29	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
20	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	18	24	22	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	21	15	24	19	13	23	16	12	20	15	10
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	21	25	22	18	24	19	16	23	17	14			
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	22	18	25	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	34	37	37	28	37	35	24	37	30	20	37	26	18	37	23	16	35	20	14
			Exposed	37	37	37	37	37	37	37	37	33	37	37	29	37	37	26	37	34	23	37	31	21	37	27	18	37	23	15	34	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	36	41	41	30	38	38	25	35	33	21	32	29	18	29	26	16
			Exposed	41	41	41	41	41	41	41	41	41	41	41	37	41	41	33	41	41	29	41	39	27	37	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	12	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	24	19	25	20	17	24	17	14	22	15	13	20	13	11	18	12	10
			Exposed	25	25	25	25	25	25	25	25	22	25	24	20	25	22	18	25	20	16	25	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	37	37	37	37	37	37	37	37	36	37	37	31	37	37	28	37	37	25	37	34	23	37	29	19	37	24	17	35	21	14	32	18	12	28	16	11	25	14	10
			Exposed	37	37	27	37	36	25	37	32	22	37	29	20	37	26	18	37	24	16	37	22	15	32	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	41	41	41	41	41	41	41	41	41	41	41	40	41	41	36	41	41	32	40	40	29	37	36	24	34	31	20	30	26	17	26	23	14	23	20	12	20	18	11
			Exposed	41	41	36	41	41	31	41	41	27	41	37	24	37	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	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	22	16	24	19	14	23	17	12	20	15	10	18	13	9
			Exposed	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	16	24	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	23	19	24	20	16	23	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	25	25	23	25	25	21	25	22	18	25	20	17	25	18	15	25	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	38	38	38	38	38	33	38	38	28	38	38	25	38	34	23	38	31	21	38	28	19	38	24	16	35	20	14	30	18	12	26	15	10	23	14	9	21	12	8
			Exposed	38	34	23	38	30	21	38	27	18	38	24	17	38	22	15	35	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	42	42	42	42	42	42	42	42	37	42	42	33	42	42	29	40	39	26	38	35	23	33	30	19	29	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	42	42	29	42	38	25	38	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
30	B	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	16
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	24	24	18	24	21	15	24	19	13	23	16	12	20	15	10
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	21	25	22	18	24	19	16	23	17	14
			Exposed	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	22	18	25	19	15	25	16	13	22	14	12	19	12	10	17	11	9
		20-27	Interior	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	20	30	26	18	30	23	16	28	20	14			
			Exposed	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	30	23	30	30	21	30	27	18	30	23	15	30	20	13	29	17	12	26	15	10	23	13	9
		27-45	Interior	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	30	32	32	25	30	30	21	29	29	18	27	26	16
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	29	34	34	27	34	33	22	32	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	24	23	16	24	20	14	24	18	12	22	16	11
			Exposed	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	24	19	24	24	17	24	20	14	24	17	12	21	15	11	18	13	9	16	12	8	14	10	7			
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	24	19	25	20	17	24	17	14	22	15	13	20	13	11	18	12	10
			Exposed	25	25	25	25	25	25	25	25	22	25	24	20	25	22	18	25	20	16	25	18	15	24	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	25	30	30	23	30	29	19	30	24	17	29	21	14	27	18	12	26	16	11	24	14	10
			Exposed	30	30	27	30	30	25	30	30	22	30	29	20	30	26	18	30	24	16	30	22	15	30	19	13	27	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	29	31	31	24	29	29	20	27	26	17	25	23	14	23	20	12	20	18	11
			Exposed	34	34	34	34	34	31	34	34	27	34	34	24	34	33	22	34	30	19	31	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	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	22	16	24	19	14	23	17	12	20	15	10	18	13	9
			Exposed	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	16	24	20	14	23	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	25	25	21	25	23	19	24	20	16	23	17	14	22	15	12	20	13	10	17	11	9	15	10	8
			Exposed	25	25	23	25	25	21	25	22	18	25	20	17	25	18	15	25	17	14	23	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	32	32	32	32	32	32	32	32	28	32	32	25	32	32	23	32	31	21	32	28	19	32	24	16	30	20	14	28	18	12	26	15	10	23	14	9	21	12	8
			Exposed	32	32	23	32	30	21	32	27	18	32	24	17	32	22	15	32	20	14	32	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	36	36	36	36	36	36	36	36	36	36	36	33	36	36	29	34	34	26	33	33	23	30	30	19	28	26	16	25	22	14	22	19	12	19	17	10	17	15	9
			Exposed	36	36	29	36	36	25	36	34	22	34	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
40	B	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	16
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	15	20	19	13	20	16	12	20	15	10
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	20	19	15	20	17	14
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	18	21	19	15	21	16	13	21	14	12	19	12	10	17	11	9
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	20	26	26	18	25	23	16	24	20	14			
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	26	21	26	26	18	26	23	15	26	20	13	26	17	12	25	15	10	23	13	9
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	25	27	27	21	25	25	18	24	24	16
			Exposed	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	27	30	30	22	30	28	18	28	25	15	24	21	13	21	19	12	19	17	10
	C	0-7	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	16	20	20	14	20	18	12	20	16	11
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	17	20	20	14	20	17	12	20	15	11	18	13	9	16	12	8	14	10	7
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	20	17	20	17	14	19	15	13	18	13	11	17	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	20	16	21	18	15	21	15	13	20	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	23	26	26	19	26	24	17	24	21	14	23	18	12	22	16	11	21	14	10
			Exposed	26	26	26	26	26	25	26	26	22	26	26	20	26	26	18	26	24	16	26	22	15	26	19	13	26	16	11	24	14	9	21	12	8	18	11	7	16	9	6
		27-45	Interior	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	27	27	27	24	26	26	20	24	24	17	23	23	14	21	20	12	20	18	11
			Exposed	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	30	19	29	28	17	26	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	16	21	21	16	21	19	14	21	17	12	20	15	10	18	13	9
			Exposed	21	21	21	21	21	21	21	21	21	21	21	19	21	21	17	21	21	16	21	20	14	21	17	12	20	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	22	22	19	22	20	16	21	17	14	20	15	12	19	13	10	17	11	9	15	10	8
			Exposed	22	22	22	22	22	21	22	22	18	22	20	17	22	18	15	22	17	14	22	15	13	20	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	27	19	27	24	16	26	20	14	24	18	12	23	15	10	22	14	9	20	12	8
			Exposed	27	27	23	27	27	21	27	27	18	27	24	17	27	22	15	27	20	14	27	18	13	27	16	11	23	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	30	30	26	29	29	23	27	27	19	25	25	16	23	22	14	22	19	12	19	17	10	17	15	9
			Exposed	31	31	29	31	31	25	31	31	22	31	31	20	31	28	18	28	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6
50	B	0-7	Interior	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	16	16	16	16
			Exposed	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	12	16	15	10
		7-20	Interior	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	17	17	17	17	17	17	17	17	17	14
			Exposed	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	15	17	16	13	17	14	12	17	12	10	17	11	9
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	22	16	21	20	14
			Exposed	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	15	22	20	13	22	17	12	22	15	10	21	13	9
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	25	24	24	21	23	23	18	21	21	16
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	15	24	21	13	21	19	12	19	17	10			
	C	0-7	Interior	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	16	16	11
			Exposed	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	12	16	15	11	16	16	13	16	13	9	16	12	8	14	10	7
		7-20	Interior	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	14	16	15	13	16	13	11	15	12	10			
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	15	17	15	13	17	13	11	17	11	9	15	10	8	13	9	7	12	8	6
		20-27	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	17	21	21	14	20	18	12	19	16	11	18	14	10			
			Exposed	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	22	16	22	22	15	22	19	13	22	16	11	21	14	9	20	12	8	18	11	7	16	9	6
		27-45	Interior	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	24	24	20	23	23	20	22	22	17	21	21	14	19	19	12	18	18	11
			Exposed	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	19	26	26	17	24	23	14	22	20	12	19	17	11	17	15	9	15	13	8	13	12	7
	D	0-7	Interior	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	18	18	14	18	17	12	18	15	10	18	13	9			
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	16	18	18	14	18	17	12	18	15	10	17	13	9	15	11	8	13	10	7	12	9	6
		7-20	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	16	18	17	14	17	15	12	17	13	10	16	11	9	15	10	8
			Exposed	19	19	19	19	19	19	19	19	18	19	19	17	19	18	15	19	17	14	19	15	13	19	13	11	17	11	9	15	9	8	13	8	7	11	7	6	10	6	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	19	24	24	16	22	20	14	21	18	12	20	15	10	19	14	9	18	12	8
			Exposed	24	24	23	24	24	21	24	24	18	24	24	17	24	22	15	24	20	14	24	18	13	24	16	11	22	13	9	20	11	8	17	10	7	15	9	6	13	8	5
		27-45	Interior	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	26	26	26	23	24	24	19	23	23	16	21	21	14	20	19	12	19	17	10	17	15	9
			Exposed	28	28	28	28	28	25	28	28	22	28	28	20	27	27	18	27	25	16	26	23	14	22	20	12	19	17	10	16	14	9	14	13	8	12	11	7	11	10	6

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
Design Standard	Risk Category	Roof Height	Seismic	Module Area	Orientation	Rail Direction	Rail Type	Clamp	Attachment

SPAN TABLES

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

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

UNIRAC

ASCE 7-16	II	30 ft	Ss = 3.00	23 sq.ft	LANDSCAPE	CROSS-SLOPE	Trim	SFM	SFM DtD-Ply
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Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																						
				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
90	B	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
		20-27	Interior	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	13
			Exposed	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	13	13	10	13	13	9			
		27-45	Interior	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	16	16	16	16	16	15	15	15			
			Exposed	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	15	16	16	13	16	16	12			
	C	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7			
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	9	7	10	8	6
		20-27	Interior	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	13	13	11	13	13	10			
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	9	13	12	8	13	11	7	13	9	6			
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	15	15	15	15	15	14	14	14	12	14	14	11			
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	14	16	16	12	15	15	11	15	15	9	14	13	8	13	12	7
	D	0-7	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8	10	10	7	10	9	6			
		7-20	Interior	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	10	11	11	9	10	10	8			
			Exposed	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	11	9	8	11	8	7	11	7	6	10	6	5			
		20-27	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	12	14	14	10	13	13	9	13	12	8			
			Exposed	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	13	15	15	11	15	13	9	14	11	8	14	10	7	13	9	6	13	8	5			
		27-45	Interior	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	17	17	17	16	16	16	16	16	14	15	15	12	14	14	10	13	13	9	
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	18	18	16	18	18	14	17	17	12	16	16	10	16	14	9	14	13	8	12	11	7	11	10	6
100	B	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		20-27	Interior	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	12	12	12	12
			Exposed	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	10	12	12	9			
		27-45	Interior	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	14	14			
			Exposed	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	12	14	14	10			
	C	0-7	Interior	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Exposed	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
		7-20	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	7	9	8	6			
		20-27	Interior	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	11	12	12	10			
			Exposed	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	9	12	12	8	12	11	7	12	9	6			
		27-45	Interior	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	14	14	14	14	13	13	12	13	13	11			
			Exposed	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	14	14	11	14	14	9	13	13	8	13	12	7
	D	0-7	Interior	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Exposed	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	9	9	6			
		7-20	Interior	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	8			
			Exposed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	8	10	8	7	10	7	6	10	6	5			
		20-27	Interior	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	13	13	10	12	12	9	12	12	8			
			Exposed	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	13	13	9	13	11	8	13	10	7	12	9	6	12	8	5			
		27-45	Interior	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	15	15	15	15	15	14	14	14	12	13	13	10	13	13	9	
			Exposed	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	14	16	16	12	15	15	10	15	14	9	14	13	8	12	11	7	11	10	6