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 7-22 Sec. 29.4.4
- 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 7-22, Fig. 29.4-7)

Snow Design Assumptions

- Ground Snow Load = 0-100 psf
- Exposure Factor coefficients of Partially Exposed condition
- Thermal Factor = 1.2
- Results based on uniform snow load

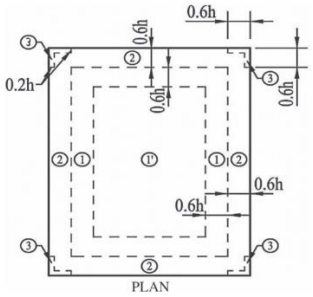
Seismic Design Assumptions

- 0.2-s Spectral Response Acceleration
- S_s = 1.25 and 3 with S_{Ds} = 1, 2.4 respectively per criteria shown on individual span tables sheets.
- S_1 = 0.5, S_{D1} = 0.6
- Seismic site class D

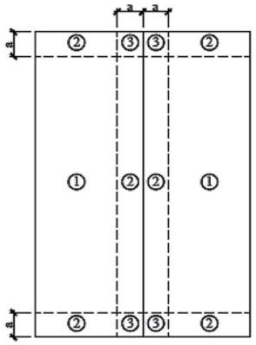
Span Tables

Array Assumptions

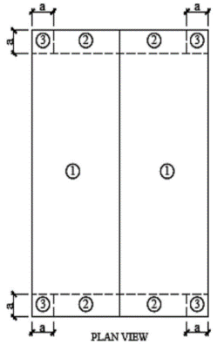
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1” x 67” (~19 sq.ft, 47.65 lbs) and 41” x 80” (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at 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 7-22 sec. 29.4.4 shall be used when any part of an exposed module or panel 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 7-22 Fig. 30.3-2A to 30.3-2D



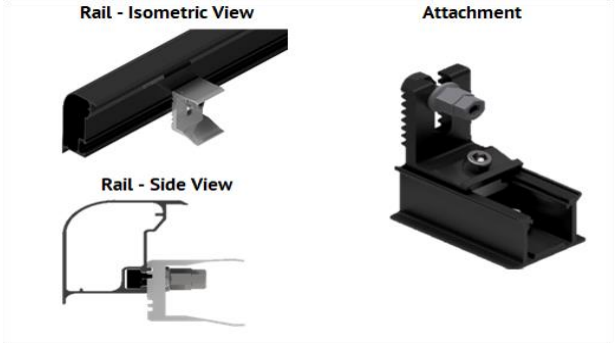
Gable Roofs θ ≤ 7°



Gable Roofs 7°< θ ≤ 27°



Gable Roofs 27°< θ ≤ 45°



Trim Rail - SFM Slider

UNIRAC

ASCE 7-22	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	95	113	113	78	113	113	65	113	93	55	113	79	48	113	69	42	99	60	38	76	47	32	60	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	113	79	47	113	66	41	92	56	36	78	49	33	67	42	30	58	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	112	112	84	112	112	67	112	98	55	112	80	46	112	66	40	112	56	37	87	48	33	62	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	112	65	40	112	53	36	80	44	32	65	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	110	110	110	110	110	110	110	110	80	110	96	65	110	78	54	110	65	46	110	55	40	99	41	34	75	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	110	77	54	110	62	44	110	51	39	110	42	35	86	38	32	74	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	107	107	107	107	107	107	107	107	107	107	107	86	107	107	72	107	88	61	107	76	53	75	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	107	107	71	107	85	59	98	71	49	78	60	42	65	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	113	86	52	113	72	43	103	61	39	86	53	35	73	46	31	64	41	29	56	37	26	44	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	36	25	45	32	23	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	73	42	112	59	38	89	49	34	72	42	30	60	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	60	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	110	86	59	110	69	48	110	56	41	110	47	37	95	41	33	81	37	30	69	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	95	40	33	78	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	107	107	79	107	93	65	107	78	54	88	65	45	72	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	71	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	113	65	40	89	55	36	75	47	32	64	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	97	52	35	76	43	31	62	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	110	60	43	110	49	38	98	41	34	82	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	107	83	57	93	68	47	75	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
10	B	0-7	Interior	95	95	95	95	95	78	95	95	65	95	93	55	95	79	48	95	69	42	95	60	38	76	47	32	60	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	95	79	47	95	66	41	92	56	36	78	49	33	67	42	30	58	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	96	96	84	96	96	67	96	96	55	96	80	46	96	66	40	96	56	37	87	48	33	62	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	96	65	40	96	53	36	80	44	32	65	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	109	109	109	109	109	109	109	109	80	109	96	65	109	78	54	109	65	46	109	55	40	99	41	34	75	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	109	77	54	109	62	44	109	51	39	109	42	35	86	38	32	74	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	107	107	107	107	107	107	107	107	107	107	107	86	107	107	72	107	88	61	107	76	53	75	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	107	107	71	107	85	59	98	71	49	78	60	42	65	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	95	86	52	95	72	43	95	61	39	86	53	35	73	46	31	64	41	29	56	37	26	44	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	36	25	45	32	23	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	96	73	42	96	59	38	89	49	34	72	42	30	60	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	60	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	109	86	59	109	69	48	109	56	41	109	47	37	95	41	33	81	37	30	69	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	95	40	33	78	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	107	107	79	107	93	65	107	78	54	88	65	45	72	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	71	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	95	65	40	89	55	36	75	47	32	64	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	96	52	35	76	43	31	62	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	110	60	43	110	49	38	98	41	34	82	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	107	83	57	93	68	47	75	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
20	B	0-7	Interior	70	70	70	70	70	70	70	70	65	70	70	55	70	70	48	70	69	42	70	60	38	70	47	32	60	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	70	70	47	70	66	41	70	56	36	70	49	33	67	42	30	58	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	71	71	71	71	71	67	71	71	55	71	71	46	71	66	40	71	56	37	71	48	33	62	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	71	65	40	71	53	36	71	44	32	65	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	86	86	86	86	86	86	86	86	80	86	86	65	86	78	54	86	65	46	86	55	40	86	41	34	75	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	86	77	54	86	62	44	86	51	39	86	42	35	86	38	32	74	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	72	84	84	61	84	76	53	75	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	84	84	71	84	84	59	84	71	49	78	60	42	65	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	70	70	52	70	70	43	70	61	39	70	53	35	70	46	31	64	41	29	56	37	26	44	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	70	45	31	61	40	28	52	36	25	45	32	23	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	71	71	42	71	59	38	71	49	34	71	42	30	60	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	60	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	86	86	59	86	69	48	86	56	41	86	47	37	86	41	33	81	37	30	69	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	86	40	33	78	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	84	84	79	84	84	65	84	78	54	84	65	45	72	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	71	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	70	65	40	70	55	36	70	47	32	64	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	71	52	35	71	43	31	62	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	90	60	43	90	49	38	90	41	34	82	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	91	83	57	91	68	47	75	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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	55	56	56	48	56	56	42	56	56	38	56	47	32	56	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	56	56	47	56	56	41	56	56	36	56	49	33	56	42	30	56	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	56	56	56	56	56	56	56	56	55	56	56	46	56	56	40	56	56	37	56	48	33	56	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	56	56	40	56	53	36	56	44	32	56	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	65	66	66	54	66	65	46	66	55	40	66	41	34	66	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	66	66	54	66	62	44	66	51	39	66	42	35	66	38	32	66	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	53	62	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	62	62	62	62	62	59	62	62	49	62	60	42	62	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	56	56	52	56	56	43	56	56	39	56	53	35	56	46	31	56	41	29	56	37	26	44	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	36	25	45	32	23	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	56	56	42	56	56	38	56	49	34	56	42	30	56	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	56	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	66	66	59	66	66	48	66	56	41	66	47	37	66	41	33	66	37	30	66	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	66	40	33	66	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	62	62	62	62	62	62	62	62	54	62	62	45	62	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	62	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	56	56	40	56	55	36	56	47	32	56	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	56	52	35	56	43	31	56	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	72	60	43	72	49	38	72	41	34	72	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	67	67	57	67	67	47	67	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
40	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	42	52	52	38	52	47	32	52	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	52	52	47	52	52	41	52	52	36	52	49	33	52	42	30	52	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	52	52	52	52	52	52	52	52	52	52	52	46	52	52	40	52	52	37	52	48	33	52	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	52	52	40	52	52	36	52	44	32	52	39	29	52	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	34	51	35	29	51	31	25	48	27	22	40	23	19	36	21	17
			Exposed	51	51	51	51	51	44	51	51	39	51	42	35	51	38	32	51	35	29	51	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	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	41	48	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	48	48	48	48	48	48	48	48	48	48	48	42	48	48	38	48	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	52	52	52	52	52	43	52	52	39	52	52	35	52	46	31	52	41	29	52	37	26	44	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	52	45	31	52	40	28	52	36	25	45	32	23	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	52	52	42	52	52	38	52	49	34	52	42	30	52	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	52	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	51	51	51	51	51	48	51	51	41	51	47	37	51	41	33	51	37	30	51	34	28	51	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	51	40	33	51	36	30	51	32	27	51	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	45	48	48	40	48	48	37	48	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	48	48	40	48	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	56	56	40	56	55	36	56	47	32	56	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	56	52	35	56	43	31	56	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	56	56	43	56	49	38	56	41	34	56	37	31	56	34	28	56	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	56	34	28	56	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	53	53	53	53	53	47	53	53	41	53	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
50	B	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	38	44	44	32	44	39	27	44	34	24	40	29	21	35	26	18	31	23	16
			Exposed	44	44	44	44	44	41	44	44	36	44	44	33	44	42	30	44	38	27	44	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	45	37	45	45	33	45	38	28	45	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	45	45	40	45	45	36	45	44	32	45	39	29	45	35	26	45	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	34	42	35	29	42	31	25	42	27	22	40	23	19	36	21	17
			Exposed	42	42	42	42	42	42	42	42	39	42	42	35	42	38	32	42	35	29	42	32	26	42	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		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	35	40	38	30	37	33	26	33	29	23	29	26	21
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	35	40	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	44	44	44	44	44	43	44	44	39	44	44	35	44	44	31	44	41	29	44	37	26	44	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	44	44	31	44	40	28	44	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	11	8	14	10	7
		7-20	Interior	45	45	42	45	45	38	45	45	34	45	42	30	45	38	28	45	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	45	37	27	45	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	42	42	42	42	42	42	42	42	41	42	42	37	42	41	33	42	37	30	42	34	28	42	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	42	40	33	42	36	30	42	32	27	42	29	24	42	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	40	40	40	40	40	36	40	40	32	40	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	48	48	40	48	48	36	48	47	32	48	41	29	48	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	48	37	26	47	33	23	41	29	21	37	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	43	31	49	38	28	49	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	46	46	43	46	46	38	46	41	34	46	37	31	46	34	28	46	31	25	46	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	46	34	28	46	30	25	46	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	44	44	44	44	44	44	44	44	41	44	44	37	44	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	44	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	32	37	37	27	37	34	24	37	29	21	35	26	18	31	23	16
			Exposed	37	37	37	37	37	37	37	37	36	37	37	33	37	37	30	37	37	27	37	35	25	37	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	33	38	38	28	38	33	24	38	28	21	34	25	18	30	22	16	26	19	14
			Exposed	38	38	38	38	38	36	38	38	32	38	38	29	38	35	26	38	32	24	38	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		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	35	29	36	31	25	36	27	22	36	23	19	36	21	17
			Exposed	36	36	36	36	36	36	36	36	36	36	36	35	36	36	32	36	35	29	36	32	26	36	27	22	36	23	19	34	20	16	30	17	14	26	15	13	23	14	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	33	26	33	29	23	29	26	21
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	37	37	37	37	37	37	37	37	37	37	37	35	37	37	31	37	37	29	37	37	26	37	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	37	37	31	37	37	28	37	36	25	37	32	23	37	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	38	38	38	38	38	38	38	38	34	38	38	30	38	38	28	38	34	25	38	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	38	37	27	38	33	25	38	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	34	28	36	28	23	36	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	36	36	33	36	36	30	36	32	27	36	29	24	36	26	22	36	24	20	36	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	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	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	34	34	34	34	34	34	34	34	32	34	34	29	34	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	41	41	40	41	41	36	41	41	32	41	41	29	41	37	26	41	34	24	41	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	41	37	26	41	33	23	41	29	21	37	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	42	42	35	42	42	31	42	38	28	42	34	25	42	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	42	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	39	39	39	39	39	38	39	39	34	39	37	31	39	34	28	39	31	25	39	28	23	39	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	39	34	28	39	30	25	39	27	22	39	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	37	30	37	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	37	37	33	37	37	30	37	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
70	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	27	32	32	24	32	29	21	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	30	21	32	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	33	24	33	28	21	33	25	18	30	22	16	26	19	14
			Exposed	33	33	33	33	33	33	33	33	32	33	33	29	33	33	26	33	32	24	33	29	22	33	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	29	31	31	25	31	27	22	31	23	19	31	21	17	31	21	17
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	27	22	31	23	19	31	20	16	30	17	14	26	15	13	23	14	11
		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	26	29	29	23	29	26	21
			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	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	29	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	23	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	33	33	33	33	33	33	33	33	33	33	33	30	33	33	28	33	33	25	33	31	23	33	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	33	33	27	33	33	25	33	30	22	33	27	20	33	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	28	31	28	23	31	24	20	31	21	17	31	18	15	28	16	13	25	14	12
			Exposed	31	31	31	31	31	30	31	31	27	31	29	24	31	26	22	31	24	20	31	22	18	31	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	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	24	29	26	21	26	23	18	23	20	16	20	18	14	20	18	14
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
	D	0-7	Interior	36	36	36	36	36	36	36	36	32	36	36	29	36	36	26	36	34	24	36	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	36	36	26	36	33	23	36	29	21	36	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	36	36	35	36	36	31	36	36	28	36	34	25	36	31	23	36	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	36	31	23	36	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	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	34	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	34	34	28	34	30	25	34	27	22	34	24	20	34	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	32	32	32	32	32	30	32	32	27	32	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
80	B	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	24	28	28	21	28	26	18	28	23	16
			Exposed	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	25	28	28	21	28	25	18	28	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	24	29	28	21	29	25	18	29	22	16	26	19	14
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26	29	29	24	29	29	22	29	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	27	27	27	25	27	27	22	27	23	19	27	21	17
			Exposed	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	23	19	27	20	16	27	17	14	26	15	13	23	14	11
		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	21
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	25	20	24	22	17	21	19	15	19	17	13	17	15	12
	C	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	26	28	28	22	28	27	19	28	23	16	28	20	14	24	18	12	22	16	11	20	15	10	18	13	9
			Exposed	28	28	28	28	28	28	28	28	25	28	28	23	28	28	20	28	26	19	28	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	25	29	29	23	29	26	19	29	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	29	29	27	29	29	25	29	29	22	29	27	20	29	24	18	29	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		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	24	27	24	20	27	21	17	27	18	15	27	16	13	25	14	12
			Exposed	27	27	27	27	27	27	27	27	27	27	27	24	27	26	22	27	24	20	27	22	18	27	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	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	24	26	26	21	26	23	18	23	20	16	20	18	14	20	18	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	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	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	31	31	26	31	31	23	31	29	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	32	32	32	32	32	31	32	32	28	32	32	25	32	31	23	32	28	21	32	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	32	31	23	32	28	20	32	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	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	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	30	30	28	30	30	25	30	27	22	30	24	20	30	22	18	30	20	16	30	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	29	29	29	29	29	29	29	29	27	29	29	24	29	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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
90	B	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	21	25	25	18	25	23	16
			Exposed	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	25	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	26	26	26	24	26	26	21	26	25	18	26	22	16	26	19	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	25	18	26	21	16	25	18	14	22	16	12	19	14	10	17	12	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	24	24	24	22	24	23	19	24	21	17
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	20	16	24	17	14	24	15	13	23	14	11
		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	23	23	23	21
			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	23	23	23	20	23	22	17	21	19	15	19	17	13
	C	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	22	25	25	19	25	23	16	25	20	14	24	18	12	22	16	11
			Exposed	25	25	25	25	25	25	25	25	25	25	25	23	25	25	20	25	25	19	25	24	17	25	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	26	19	26	22	17	26	19	14	23	17	12	20	15	11	18	13	10
			Exposed	26	26	26	26	26	25	26	26	22	26	26	20	26	24	18	26	22	16	26	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	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	23	24	24	20	24	21	17	24	18	15	24	16	13	24	14	12
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	19	15	24	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		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	20	16	20	18	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	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	22	28	26	18	28	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	28	28	26	28	28	23	28	28	21	28	27	19	28	24	17	28	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	29	29	29	29	29	29	29	29	28	29	29	25	29	29	23	29	28	21	29	26	19	29	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	29	29	23	29	28	20	29	25	18	29	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	24	20	27	20	17	27	17	14	26	15	13	23	13	11	20	12	10
			Exposed	27	27	27	27	27	25	27	27	22	27	24	20	27	22	18	27	20	16	27	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	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	23	26	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
100	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	23	23	23	23	23	23	23	23	23	21	23	23	18	23	23	16
			Exposed	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	23	19	13	23	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	23	18	23	22	16	23	19	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	21	16	23	18	14	22	16	12	19	14	10	17	12	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	19	22	21	17			
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	20	16	22	17	14	22	15	13	22	14	11
		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	21	21	21	21
			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	21	21	21	20	21	21	17	21	19	15	19	17	13
	C	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	16	23	20	14	23	18	12	22	16	11
			Exposed	23	23	23	23	23	23	23	23	23	23	23	20	23	23	19	23	23	17	23	20	14	23	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	22	17	23	19	14	23	17	12	20	15	11	18	13	10
			Exposed	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	22	16	23	20	15	23	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	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	21	17	22	18	15	22	16	13	22	14	12			
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	19	15	22	16	13	22	14	11	20	12	10	18	10	9	16	9	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	18	21	20	16	20	18	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	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	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	18	25	22	16	25	19	13	23	17	12	20	15	10	18	13	9
			Exposed	25	25	25	25	25	23	25	25	21	25	25	19	25	24	17	25	22	15	25	20	14	23	17	12	20	14	10	17	12	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	26	21	26	26	19	26	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	26	26	23	26	26	20	26	25	18	26	22	16	26	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	20	17	24	17	14	24	15	13	23	13	11	20	12	10
			Exposed	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	20	16	24	18	15	24	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	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	22	17	21	19	15	19	17	13	17	15	12			
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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	113	188	188	80	188	167	64	188	95	54	173	66	46	101	56	40	71	49	35	60	43	31	53	38	27
			Exposed	188	188	111	188	188	74	188	140	61	188	101	55	188	79	50	162	65	45	115	59	42	73	50	35	59	42	30	51	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	79	187	187	61	187	187	56	187	64	47	187	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	187	187	77	187	187	60	187	187	54	187	68	48	187	60	44	187	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	90	185	185	57	185	59	49	185	51	42	123	45	37	73	39	33	60	35	29
			Exposed	185	185	185	185	185	185	185	185	65	185	185	59	185	64	53	185	59	48	185	54	44	133	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	81	179	106	59	179	64	51	63	56	44	55	49	39	49	44	35
			Exposed	179	179	179	179	179	179	179	179	179	179	179	93	179	179	64	179	99	58	179	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	188	188	164	188	188	88	188	178	65	188	119	58	188	90	53	188	72	48	140	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	188	89	53	188	68	47	120	60	42	89	54	38	70	49	34	61	44	31	56	41	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	187	57	187	100	51	187	63	46	187	57	42	187	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	187	63	46	187	56	41	187	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	185	185	185	185	185	185	185	185	185	185	185	62	185	89	56	185	62	51	185	57	47	185	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	185	85	56	185	61	50	185	54	45	185	49	40	117	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	179	179	179	179	179	179	179	179	179	179	179	179	179	179	74	179	148	61	179	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	179	179	73	179	118	60	179	74	54	179	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	188	188	71	188	130	60	188	94	54	188	73	48	139	62	44	102	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	137	62	44	95	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	187	187	59	187	187	53	187	64	47	187	58	43	187	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	187	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	185	185	185	185	185	64	185	185	57	185	63	52	185	57	47	185	52	43	185	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	185	56	47	185	50	42	130	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	179	179	179	179	179	179	179	179	80	179	179	62	179	86	56	179	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	179	85	56	179	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
10	B	0-7	Interior	159	159	159	159	159	159	159	159	159	159	159	159	159	159	113	159	159	80	159	159	64	159	95	54	159	66	46	101	56	40	71	49	35	60	43	31	53	38	27
			Exposed	159	159	111	159	159	74	159	140	61	159	101	55	159	79	50	159	65	45	115	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	161	161	161	161	161	161	161	161	161	161	161	161	161	161	79	161	161	61	161	161	56	161	64	47	161	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	161	161	77	161	161	60	161	161	54	161	68	48	161	60	44	161	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	90	183	183	57	183	59	49	183	51	42	123	45	37	73	39	33	60	35	29
			Exposed	183	183	183	183	183	183	183	183	65	183	183	59	183	64	53	183	59	48	183	54	44	133	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	81	179	106	59	179	64	51	63	56	44	55	49	39	49	44	35
			Exposed	179	179	179	179	179	179	179	179	179	179	179	93	179	179	64	179	99	58	179	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	159	159	159	159	159	88	159	159	65	159	119	58	159	90	53	159	72	48	140	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	159	89	53	159	68	47	120	60	42	89	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	161	161	161	161	161	63	161	161	57	161	100	51	161	63	46	161	57	42	161	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	161	63	46	161	56	41	161	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	183	183	183	183	183	183	183	183	183	183	183	62	183	89	56	183	62	51	183	57	47	183	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	183	85	56	183	61	50	183	54	45	183	49	40	117	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	179	179	179	179	179	179	179	179	179	179	179	179	179	179	74	179	148	61	179	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	179	179	73	179	118	60	179	74	54	179	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	159	159	71	159	130	60	159	94	54	159	73	48	139	62	44	102	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	137	62	44	95	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	161	161	59	161	161	53	161	64	47	161	58	43	161	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	161	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	185	185	185	185	185	64	185	185	57	185	63	52	185	57	47	185	52	43	185	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	185	56	47	185	50	42	130	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	179	179	179	179	179	179	179	179	80	179	179	62	179	86	56	179	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	179	85	56	179	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
20	B	0-7	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	113	118	118	80	118	118	64	118	95	54	118	66	46	101	56	40	71	49	35	60	43	31	53	38	27
			Exposed	118	118	111	118	118	74	118	118	61	118	101	55	118	79	50	118	65	45	115	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	119	119	119	119	119	119	119	119	119	119	119	119	119	119	79	119	119	61	119	119	56	119	64	47	119	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	119	119	77	119	119	60	119	119	54	119	68	48	119	60	44	119	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	90	144	144	57	144	59	49	144	51	42	123	45	37	73	39	33	60	35	29
			Exposed	144	144	144	144	144	144	144	144	65	144	144	59	144	64	53	144	59	48	144	54	44	133	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	81	141	106	59	141	64	51	63	56	44	55	49	39	49	44	35
			Exposed	141	141	141	141	141	141	141	141	141	141	141	93	141	141	64	141	99	58	141	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	118	118	118	118	118	88	118	118	65	118	118	58	118	90	53	118	72	48	118	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	118	89	53	118	68	47	118	60	42	89	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	119	119	119	119	119	63	119	119	57	119	100	51	119	63	46	119	57	42	119	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	119	63	46	119	56	41	119	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	144	144	144	144	144	144	144	144	144	144	144	62	144	89	56	144	62	51	144	57	47	144	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	144	85	56	144	61	50	144	54	45	144	49	40	117	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	141	141	141	141	141	141	141	141	141	141	141	141	141	141	74	141	141	61	141	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	141	141	73	141	118	60	141	74	54	141	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	118	118	71	118	118	60	118	94	54	118	73	48	118	62	44	102	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	118	62	44	95	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	119	119	59	119	119	53	119	64	47	119	58	43	119	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	119	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	151	151	151	151	151	64	151	151	57	151	63	52	151	57	47	151	52	43	151	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	151	56	47	151	50	42	130	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	153	153	153	153	153	153	153	153	80	153	153	62	153	86	56	153	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	153	85	56	153	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	80	94	94	64	94	94	54	94	66	46	94	56	40	71	49	35	60	43	31	53	38	27
			Exposed	94	94	94	94	94	74	94	94	61	94	94	55	94	79	50	94	65	45	94	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	79	94	94	61	94	94	56	94	64	47	94	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	94	94	77	94	94	60	94	94	54	94	68	48	94	60	44	94	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	90	111	111	57	111	59	49	111	51	42	111	45	37	73	39	33	60	35	29
			Exposed	111	111	111	111	111	111	111	111	65	111	111	59	111	64	53	111	59	48	111	54	44	111	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	81	103	103	59	103	64	51	63	56	44	55	49	39	49	44	35
			Exposed	103	103	103	103	103	103	103	103	103	103	103	93	103	103	64	103	99	58	103	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	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	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	94	89	53	94	68	47	94	60	42	89	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	94	94	94	94	94	63	94	94	57	94	94	51	94	63	46	94	57	42	94	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	94	63	46	94	56	41	94	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	111	111	111	111	111	111	111	111	111	111	111	62	111	89	56	111	62	51	111	57	47	111	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	111	85	56	111	61	50	111	54	45	111	49	40	111	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	74	103	103	61	103	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	103	103	73	103	103	60	103	74	54	103	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	94	94	71	94	94	60	94	94	54	94	73	48	94	62	44	94	57	40	81	52	37	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	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	94	94	59	94	94	53	94	64	47	94	58	43	94	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	94	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	121	121	121	121	121	64	121	121	57	121	63	52	121	57	47	121	52	43	121	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	121	56	47	121	50	42	121	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	112	112	112	112	112	112	112	112	80	112	112	62	112	86	56	112	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	112	85	56	112	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
40	B	0-7	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	80	87	87	64	87	87	54	87	66	46	87	56	40	71	49	35	60	43	31	53	38	27
			Exposed	87	87	87	87	87	74	87	87	61	87	87	55	87	79	50	87	65	45	87	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	79	88	88	61	88	88	56	88	64	47	88	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	88	88	77	88	88	60	88	88	54	88	68	48	88	60	44	88	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	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	57	86	59	49	86	51	42	86	45	37	73	39	33	60	35	29
			Exposed	86	86	86	86	86	86	86	86	65	86	86	59	86	64	53	86	59	48	86	54	44	86	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	59	81	64	51	63	56	44	55	49	39	49	44	35
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	64	81	81	58	81	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	87	87	87	87	87	87	87	87	65	87	87	58	87	87	53	87	72	48	87	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	87	87	53	87	68	47	87	60	42	87	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	88	88	88	88	88	63	88	88	57	88	88	51	88	63	46	88	57	42	88	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	88	63	46	88	56	41	88	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	62	86	86	56	86	62	51	86	57	47	86	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	86	85	56	86	61	50	86	54	45	86	49	40	86	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	74	81	81	61	81	81	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	81	81	73	81	81	60	81	74	54	81	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	93	93	71	93	93	60	93	93	54	93	73	48	93	62	44	93	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	93	62	44	93	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	94	94	59	94	94	53	94	64	47	94	58	43	94	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	94	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	95	95	95	95	95	64	95	95	57	95	63	52	95	57	47	95	52	43	95	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	95	56	47	95	50	42	95	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	89	89	89	89	89	89	89	89	80	89	89	62	89	86	56	89	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	89	85	56	89	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
50	B	0-7	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	64	75	75	54	75	66	46	75	56	40	71	49	35	60	43	31	53	38	27
			Exposed	75	75	75	75	75	74	75	75	61	75	75	55	75	75	50	75	65	45	75	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	61	76	76	56	76	64	47	76	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	76	76	76	76	76	60	76	76	54	76	68	48	76	60	44	76	54	40	76	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	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	57	71	59	49	71	51	42	71	45	37	71	39	33	60	35	29
			Exposed	71	71	71	71	71	71	71	71	65	71	71	59	71	64	53	71	59	48	71	54	44	71	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		27-45	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	59	67	64	51	63	56	44	55	49	39	49	44	35
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	64	67	67	58	67	67	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	75	75	75	75	75	75	75	75	65	75	75	58	75	75	53	75	72	48	75	62	44	75	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	75	75	53	75	68	47	75	60	42	75	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	76	76	76	76	76	63	76	76	57	76	76	51	76	63	46	76	57	42	76	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	76	63	46	76	56	41	76	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	62	71	71	56	71	62	51	71	57	47	71	48	40	71	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	71	71	56	71	61	50	71	54	45	71	49	40	71	44	37	71	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	56	67	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	67	67	67	67	67	60	67	67	54	67	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	81	81	71	81	81	60	81	81	54	81	73	48	81	62	44	81	57	40	81	52	37	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	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	81	81	59	81	81	53	81	64	47	81	58	43	81	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	81	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	78	78	78	78	78	64	78	78	57	78	63	52	78	57	47	78	52	43	78	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	78	56	47	78	50	42	78	45	37	78	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	62	73	73	56	73	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	73	73	56	73	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	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	60	43	31	53	38	27
			Exposed	63	63	63	63	63	63	63	63	61	63	63	55	63	63	50	63	63	45	63	59	42	63	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	61	64	64	56	64	64	47	64	55	41	64	47	35	57	41	31	50	36	27	44	32	24
			Exposed	64	64	64	64	64	60	64	64	54	64	64	48	64	60	44	64	54	40	64	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		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	57	60	59	49	60	51	42	60	45	37	60	39	33	60	35	29
			Exposed	60	60	60	60	60	60	60	60	60	60	60	59	60	60	53	60	59	48	60	54	44	60	45	37	60	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	51	57	56	44	55	49	39	49	44	35
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	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	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	63	63	53	63	63	47	63	60	42	63	54	38	63	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	64	64	64	64	64	63	64	64	57	64	64	51	64	63	46	64	57	42	64	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	64	63	46	64	56	41	64	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	56	60	60	51	60	57	47	60	48	40	60	41	34	60	35	29	53	31	26	47	27	23	41	24	20
			Exposed	60	60	56	60	60	50	60	54	45	60	49	40	60	44	37	60	40	33	60	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24			
			Exposed	57	57	57	57	57	57	57	57	54	57	57	49	57	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	69	69	69	69	69	60	69	69	54	69	69	48	69	62	44	69	57	40	69	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	69	62	44	69	55	39	69	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	70	70	59	70	70	53	70	64	47	70	58	43	70	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	70	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	66	66	66	66	66	64	66	66	57	66	63	52	66	57	47	66	52	43	66	47	39	66	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	66	56	47	66	50	42	66	45	37	66	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	51	62	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	62	62	56	62	62	50	62	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
70	B	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	49	35	54	43	31	53	38	27			
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	50	54	54	45	54	54	42	54	50	35	54	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		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	47	55	55	41	55	47	35	55	41	31	50	36	27	44	32	24
			Exposed	55	55	55	55	55	55	55	55	54	55	55	48	55	55	44	55	54	40	55	50	37	55	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	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	49	52	51	42	52	45	37	52	39	33	52	35	29			
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	44	52	45	37	52	39	32	52	34	28	50	29	24	44	26	21	39	23	19
		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	44	49	49	39	49	44	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	45	49	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	53	54	54	48	54	54	44	54	53	37	54	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	54	54	53	54	54	47	54	54	42	54	54	38	54	49	34	54	44	31	54	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	51	55	55	46	55	55	42	55	52	39	55	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	55	55	46	55	55	41	55	50	37	55	45	33	55	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	47	52	48	40	52	41	34	52	35	29	52	31	26	47	27	23	41	24	20
			Exposed	52	52	52	52	52	50	52	52	45	52	49	40	52	44	37	52	40	33	52	37	31	52	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	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	47	49	49	41	49	44	35	43	39	31	38	34	27	34	30	24
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	40	49	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	60	60	60	60	60	60	60	60	54	60	60	48	60	60	44	60	57	40	60	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	60	60	44	60	55	39	60	50	35	60	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	61	61	59	61	61	53	61	61	47	61	58	43	61	52	39	61	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	61	52	39	61	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	57	57	57	57	57	57	57	57	57	57	57	52	57	57	47	57	52	43	57	47	39	57	40	33	57	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	57	56	47	57	50	42	57	45	37	57	41	34	57	37	31	57	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	47	54	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	54	54	54	54	54	50	54	54	45	54	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
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	46	48	48	40	48	48	35	48	43	31	48	38	27			
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	45	48	48	42	48	48	35	48	42	30	48	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	41	49	47	35	49	41	31	49	36	27	44	32	24
			Exposed	49	49	49	49	49	49	49	49	49	49	49	48	49	49	44	49	49	40	49	49	37	49	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		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	44	46	46	40	46	46	35	46	46	35	46	39	29			
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	45	37	46	39	32	46	34	28	46	29	24	44	26	21	39	23	19
		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	43	43	43	39	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	38	43	42	33	41	37	29	36	32	26	32	29	23			
	C	0-7	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	44	48	48	37	48	45	32	48	39	27	47	34	24	41	30	21	36	26	19
			Exposed	48	48	48	48	48	47	48	48	42	48	48	38	48	48	34	48	44	31	48	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	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	49	39	49	44	33	49	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	49	49	46	49	49	41	49	49	37	49	45	33	49	41	30	49	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	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	40	46	41	34	46	35	29	46	31	26	46	27	23	41	24	20
			Exposed	46	46	46	46	46	46	46	46	45	46	46	40	46	44	37	46	40	33	46	37	31	46	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		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	41	43	43	35	43	39	31	38	34	27	33	30	24			
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	48	53	53	44	53	53	40	53	52	37	53	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	53	53	44	53	53	39	53	50	35	53	45	32	53	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	54	54	54	54	54	53	54	54	47	54	54	43	54	52	39	54	48	35	54	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	54	52	39	54	47	34	54	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	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	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	50	50	47	50	50	42	50	45	37	50	41	34	50	37	31	50	34	28	50	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	47	48	48	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	48	48	48	48	48	48	48	48	45	48	48	40	48	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	43	43	43	43	43	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	31	43	38	27
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	35	43	42	30	43	37	26	43	32	23	39	28	20	34	25	18
		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	41	43	43	35	43	41	31	43	36	27	43	32	24
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	42	31	43	36	27	42	31	23	37	27	20	33	24	18	29	21	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	41	41	41	37	41	39	33	41	35	29
			Exposed	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	39	32	41	34	28	41	29	24	41	26	21	39	23	19
		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	39	39	39	35
			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	38	39	39	33	39	37	29	36	32	26	32	29	23
	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	37	43	43	32	43	39	27	43	34	24	41	30	21	36	26	19
			Exposed	43	43	43	43	43	43	43	43	42	43	43	38	43	43	34	43	43	31	43	41	29	43	34	24	40	29	21	35	25	18	30	22	16	27	20	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	39	43	43	33	43	38	28	43	33	24	39	29	21	35	25	19	31	22	17
			Exposed	43	43	43	43	43	41	43	43	37	43	43	33	43	41	30	43	37	28	43	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	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	40	41	41	34	41	35	29	41	31	26	41	27	23	41	24	20
			Exposed	41	41	41	41	41	41	41	41	41	41	41	40	41	41	37	41	40	33	41	37	31	41	31	26	41	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		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	35	39	39	31	38	34	27	34	30	24
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	40	47	47	37	47	44	31	47	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	47	47	44	47	47	39	47	47	35	47	45	32	47	41	29	47	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	48	48	48	48	48	48	48	48	47	48	48	43	48	48	39	48	48	35	48	44	32	48	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	48	48	39	48	47	34	48	42	31	48	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	39	45	40	33	45	34	28	45	30	24	44	26	21	39	23	19	34	20	17
			Exposed	45	45	45	45	45	42	45	45	37	45	41	34	45	37	31	45	34	28	45	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	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	40	43	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
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	35	39	39	31	39	38	27
			Exposed	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	39	37	26	39	32	23	39	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	35	39	39	31	39	39	30	39	37	26	39	32	24	39	36	27
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	31	39	36	27	39	31	23	37	27	20	33	24	18	29	21	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	37	37	37	33	37	35	29
			Exposed	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	32	37	34	28	37	29	24	37	26	21	37	23	19
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	32	26	32	29	23
	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	37	39	39	32	39	39	27	39	34	24	39	30	21	36	26	19
			Exposed	39	39	39	39	39	39	39	39	39	39	39	38	39	39	34	39	39	31	39	39	29	39	34	24	39	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	38	28	39	33	24	39	29	21	35	25	19	31	22	17
			Exposed	39	39	39	39	39	39	39	39	37	39	39	33	39	39	30	39	37	28	39	34	25	39	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	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	35	29	37	31	26	37	27	23	37	24	20	37	24	20
			Exposed	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	37	31	37	31	26	37	27	22	37	23	19	35	20	17	30	18	15	27	16	13
		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	31	35	34	27	34	30	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	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	43	31	43	37	26	43	32	23	39	28	20	34	25	18	30	22	16
			Exposed	43	43	43	43	43	39	43	43	35	43	43	32	43	41	29	43	37	26	43	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	35	43	43	32	43	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	43	43	39	43	43	34	43	42	31	43	38	28	43	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	41	41	39	41	40	33	41	34	28	41	30	24	41	26	21	39	23	19	34	20	17
			Exposed	41	41	41	41	41	41	41	41	37	41	41	34	41	37	31	41	34	28	41	31	25	41	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	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	34	39	37	29	36	32	26	32	29	23	28	25	20
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	33	39	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	80	94	94	65	94	92	55	94	78	46	94	66	40	94	57	35	83	50	32	63	39	27	50	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	94	66	40	93	55	34	77	47	30	66	41	27	56	35	25	49	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	94	94	71	94	94	56	94	83	46	94	67	38	94	55	34	89	47	31	73	40	28	52	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	94	55	34	84	45	30	67	37	27	54	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	93	93	93	93	93	85	93	93	67	93	80	54	93	65	45	93	54	38	93	46	34	83	35	28	63	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	93	65	45	93	52	37	93	42	32	86	35	29	72	32	26	62	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	89	89	89	89	89	89	89	89	88	89	89	72	89	88	60	89	74	51	89	64	44	63	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	89	87	60	89	71	49	82	59	41	66	50	35	54	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	94	72	43	94	60	36	85	51	32	72	44	29	61	38	26	53	34	24	47	31	22	36	26	18	31	22	16	27	19	14	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	61	35	94	49	32	75	41	28	61	35	25	50	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	50	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	93	72	50	93	57	40	93	47	34	93	39	31	80	34	28	68	31	25	58	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	79	34	28	65	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	89	89	66	89	78	54	89	65	45	74	55	38	60	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	60	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	91	54	33	75	46	30	63	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	81	43	29	64	36	26	52	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	93	50	36	93	41	32	82	35	28	69	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	89	69	48	78	57	40	62	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
10	B	0-7	Interior	80	80	80	80	80	65	80	80	55	80	78	46	80	66	40	80	57	35	80	50	32	63	39	27	50	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	80	66	40	80	55	34	77	47	30	66	41	27	56	35	25	49	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	80	80	71	80	80	56	80	80	46	80	67	38	80	55	34	80	47	31	73	40	28	52	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	80	55	34	80	45	30	67	37	27	54	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	91	91	91	91	91	85	91	91	67	91	80	54	91	65	45	91	54	38	91	46	34	83	35	28	63	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	91	65	45	91	52	37	91	42	32	86	35	29	72	32	26	62	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	89	89	89	89	89	89	89	89	88	89	89	72	89	88	60	89	74	51	89	64	44	63	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	89	87	60	89	71	49	82	59	41	66	50	35	54	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	80	72	43	80	60	36	80	51	32	72	44	29	61	38	26	53	34	24	47	31	22	36	26	18	31	22	16	27	19	14	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	80	61	35	80	49	32	75	41	28	61	35	25	50	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	50	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	91	72	50	91	57	40	91	47	34	91	39	31	80	34	28	68	31	25	58	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	79	34	28	65	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	89	89	66	89	78	54	89	65	45	74	55	38	60	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	60	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	80	54	33	75	46	30	63	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	80	43	29	64	36	26	52	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	93	50	36	93	41	32	82	35	28	69	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	89	69	48	78	57	40	62	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
20	B	0-7	Interior	59	59	59	59	59	59	59	59	55	59	59	46	59	59	40	59	57	35	59	50	32	59	39	27	50	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	59	59	40	59	55	34	59	47	30	59	41	27	56	35	25	49	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	59	59	59	59	59	56	59	59	46	59	59	38	59	55	34	59	47	31	59	40	28	52	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	59	55	34	59	45	30	59	37	27	54	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	72	72	72	72	72	72	72	72	67	72	72	54	72	65	45	72	54	38	72	46	34	72	35	28	63	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	72	65	45	72	52	37	72	42	32	72	35	29	72	32	26	62	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	60	70	70	51	70	64	44	63	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	70	70	60	70	70	49	70	59	41	66	50	35	54	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	59	59	43	59	59	36	59	51	32	59	44	29	59	38	26	53	34	24	47	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	59	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	59	59	35	59	49	32	59	41	28	59	35	25	50	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	50	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	72	72	50	72	57	40	72	47	34	72	39	31	72	34	28	68	31	25	58	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	72	34	28	65	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	70	70	66	70	70	54	70	65	45	70	55	38	60	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	60	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	59	54	33	59	46	30	59	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	59	43	29	59	36	26	52	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	75	50	36	75	41	32	75	35	28	69	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	76	69	48	76	57	40	62	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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	46	47	47	40	47	47	35	47	47	32	47	39	27	47	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	47	47	40	47	47	34	47	47	30	47	41	27	47	35	25	47	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	47	47	47	47	47	47	47	47	46	47	47	38	47	47	34	47	47	31	47	40	28	47	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	47	47	34	47	45	30	47	37	27	47	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	54	55	55	45	55	54	38	55	46	34	55	35	28	55	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	55	55	45	55	52	37	55	42	32	55	35	29	55	32	26	55	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	51	51	51	51	51	49	51	51	41	51	50	35	51	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	47	47	43	47	47	36	47	47	32	47	44	29	47	38	26	47	34	24	47	31	22	36	26	18	31	22	16	27	19	14	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	47	47	35	47	47	32	47	41	28	47	35	25	47	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	47	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	55	55	50	55	55	40	55	47	34	55	39	31	55	34	28	55	31	25	55	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	55	34	28	55	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	51	51	51	51	51	51	51	51	45	51	51	38	51	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	47	47	33	47	46	30	47	39	27	47	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	47	43	29	47	36	26	47	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	60	50	36	60	41	32	60	35	28	60	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	56	56	48	56	56	40	56	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
40	B	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	43	32	43	39	27	43	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	43	43	40	43	43	34	43	43	30	43	41	27	43	35	25	43	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	38	44	44	34	44	44	31	44	40	28	44	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	44	44	34	44	44	30	44	37	27	44	33	24	44	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	38	43	43	34	43	35	28	43	30	24	43	25	21	40	22	18	34	20	16	30	17	14
			Exposed	43	43	43	43	43	37	43	42	32	43	35	29	43	32	26	43	29	24	43	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	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	34	40	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	40	40	40	40	40	40	40	40	40	40	40	35	40	40	32	40	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	43	43	43	43	43	36	43	43	32	43	43	29	43	38	26	43	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	43	38	26	43	33	23	43	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	44	44	35	44	44	32	44	41	28	44	35	25	44	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	44	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	43	43	43	43	43	40	43	43	34	43	39	31	43	34	28	43	31	25	43	28	23	43	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	43	34	28	43	30	25	43	27	22	43	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	40	40	33	40	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	46	46	33	46	46	30	46	39	27	46	34	24	46	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	47	43	29	47	36	26	47	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	47	47	36	47	41	32	47	35	28	47	31	26	47	28	23	47	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	47	28	23	47	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	44	44	44	44	44	40	44	44	34	44	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
50	B	0-7	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	32	37	37	27	37	33	23	37	28	20	34	24	17	30	21	15	26	19	13
			Exposed	37	37	37	37	37	34	37	37	30	37	37	27	37	35	25	37	32	23	37	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	31	38	38	28	38	32	24	38	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	38	38	34	38	38	30	38	37	27	38	33	24	38	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	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	28	35	30	24	35	25	21	35	22	18	34	20	16	30	17	14
			Exposed	35	35	35	35	35	35	35	35	32	35	35	29	35	32	26	35	29	24	35	27	22	35	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		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	29	33	32	25	31	28	22	27	25	19	24	22	17
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	37	37	37	37	37	36	37	37	32	37	37	29	37	37	26	37	34	24	37	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	37	37	26	37	33	23	37	30	21	37	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	38	38	35	38	38	32	38	38	28	38	35	25	38	31	23	38	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	38	31	23	38	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	35	35	35	35	35	35	35	35	34	35	35	31	35	34	28	35	31	25	35	28	23	35	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	35	34	28	35	30	25	35	27	22	35	24	20	35	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	33	33	33	33	33	30	33	33	27	33	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	40	40	33	40	40	30	40	39	27	40	34	24	40	31	22	40	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	40	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	41	41	29	41	36	26	41	32	23	41	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	39	39	36	39	39	32	39	35	28	39	31	26	39	28	23	39	26	21	39	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	39	28	23	39	25	21	39	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	36	36	36	36	36	36	36	36	34	36	36	31	36	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	36	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	27	31	31	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	23	31	29	21	31	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	28	32	32	24	32	27	20	32	24	17	28	21	15	25	18	13	22	16	12
			Exposed	32	32	32	32	32	30	32	32	27	32	32	24	32	30	22	32	27	20	32	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	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	28	30	30	24	30	25	21	30	22	18	30	20	16	30	17	14
			Exposed	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	29	24	30	27	22	30	22	18	30	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		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	25	28	28	22	27	25	19	24	22	17
			Exposed	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	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	14	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	32	32	32	32	32	32	32	32	28	32	32	25	32	31	23	32	29	21	32	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	32	31	23	32	28	20	32	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	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	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	30	30	28	30	30	25	30	27	22	30	24	20	30	22	18	30	20	17	30	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		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	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	28	28	28	28	28	28	28	28	27	28	28	24	28	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	35	35	33	35	35	30	35	35	27	35	34	24	35	31	22	35	28	20	35	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	35	31	22	35	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	35	35	29	35	35	26	35	32	23	35	29	21	35	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	35	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	33	33	33	33	33	32	33	33	28	33	31	26	33	28	23	33	26	21	33	23	19	33	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	33	28	23	33	25	21	33	22	18	33	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	31	31	28	31	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	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	23	27	27	20	27	24	17	27	21	15	26	19	13
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	25	17	27	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	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	24	17	27	21	15	25	18	13	22	16	12
			Exposed	27	27	27	27	27	27	27	27	27	27	27	24	27	27	22	27	27	20	27	25	18	27	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	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	24	26	25	21	26	22	18	26	20	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	26	17	14	25	14	12	22	13	10	19	11	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	24	24	24	24	24	22	24	24	19	24	22	17
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	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	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	26	19	27	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	27	27	23	27	27	20	27	25	18	27	22	17	27	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		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	24	20	26	20	17	26	18	14	26	15	13	23	13	11	20	12	10
			Exposed	26	26	26	26	26	25	26	26	22	26	24	20	26	22	18	26	20	17	26	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	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	24	24	20	24	22	17	21	19	15	19	17	13	17	15	12			
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	28	20	30	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	30	30	22	30	27	19	30	25	17	30	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	30	30	29	30	30	26	30	30	23	30	29	21	30	26	19	30	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	30	26	19	30	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	28	28	28	28	28	28	28	28	28	28	28	26	28	28	23	28	26	21	28	23	19	28	20	16	28	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	28	28	23	28	25	21	28	22	18	28	20	17	28	18	15	28	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	27	27	27	27	27	25	27	27	22	27	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	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	23	24	24	20	24	24	17	24	21	15	24	19	13
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	17	24	21	15	24	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	17	24	21	15	24	18	13	22	16	12
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	24	18	24	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		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	21	23	23	18	23	22	18	23	20	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	17	14	23	14	12	22	13	10	19	11	9
		27-45	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	17
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	21	16	20	18	14	18	16	13	16	14	11	14	12	10
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	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	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	22	16	24	19	14	22	16	12	19	14	10	17	12	9	15	11	8	13	9	7
			Exposed	24	24	23	24	24	20	24	24	18	24	22	17	24	20	15	24	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		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	23	18	14	23	15	13	23	13	11	20	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	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	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	21	19	15	19	17	13	17	15	12			
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	18	26	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	26	26	22	26	26	19	26	25	17	26	22	16	26	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	27	27	27	27	27	26	27	27	23	27	27	21	27	26	19	27	24	17	27	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	27	26	19	27	23	17	27	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	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	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	25	25	23	25	25	21	25	22	18	25	20	17	25	18	15	25	17	14	25	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	24	24	24	24	24	24	24	24	22	24	24	20	24	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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
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	20	21	21	17	21	21	15	21	19	13
			Exposed	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	13	21	16	11	19	14	10	17	12	9
		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	20	21	21	17	21	21	15	21	18	13	21	16	12
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	15	21	18	13	21	15	11	18	13	10	16	12	9	14	10	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	20	20	20	20	20	20	18	20	20	16	20	17	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	19	16	20	17	14	20	14	12	20	13	10	19	11	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	19	19	19	19	19	19	19	19	17
			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	19	18	14	18	16	13	16	14	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	18	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	12	9	15	11	8	13	10	7	12	8	6
		7-20	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	19	14	21	16	12	19	14	10	17	12	9	15	11	8
			Exposed	21	21	21	21	21	20	21	21	18	21	21	17	21	20	15	21	18	14	21	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	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	18	14	20	15	13	20	13	11	20	12	10	17	12	9
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	17	20	18	15	20	15	13	20	13	11	20	11	9	17	10	8	15	9	7	13	8	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	19	19	19	19	19	17	19	19	15	19	17	13	17	15	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	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	22	15	23	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	23	23	22	23	23	19	23	23	17	23	22	16	23	20	14	23	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	24	24	24	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	16	24	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	24	24	19	24	23	17	24	21	15	24	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	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	22	13	10	19	11	9	17	10	8
			Exposed	22	22	22	22	22	21	22	22	18	22	20	17	22	18	15	22	17	14	22	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	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	20	21	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	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	17	19	19	15	19	19	13			
			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	15	19	18	13	19	16	11	19	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	19	15	19	18	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	15	11	18	13	10	16	12	9	14	10	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	16	18	17	14	18	14	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	18	18	18	16	18	17	14	18	14	12	18	13	10	18	11	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	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	17	17	17	14	17	16	13	16	14	11	14	12	10
	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	18	19	19	16	19	19	14	19	17	12	19	15	10	18	13	9
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	15	19	19	14	19	17	12	19	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	19	14	19	16	12	19	14	10	17	12	9	15	11	8
			Exposed	19	19	19	19	19	19	19	19	18	19	19	17	19	19	15	19	18	14	19	17	12	19	14	10	17	12	9	14	11	8	13	9	7	11	8	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	15	13	18	13	11	18	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	15	13	18	13	11	18	11	9	17	10	8	15	9	7	13	8	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	15	17	17	13	17	15	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	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	15	21	18	13	21	16	11	19	14	10	17	12	9	15	11	8			
			Exposed	21	21	21	21	21	19	21	21	17	21	21	16	21	20	14	21	18	13	21	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	21	17	21	21	16	21	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	21	21	19	21	21	17	21	21	15	21	19	14	21	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	20	16	20	17	14	20	15	12	20	13	10	19	11	9	17	10	8			
			Exposed	20	20	20	20	20	20	20	20	18	20	20	17	20	18	15	20	17	14	20	15	13	20	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	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	17	19	19	14	18	16	13	16	14	11	14	12	10			
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	17	19	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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	104	185	185	75	185	153	62	185	90	53	157	64	45	95	55	39	68	48	34	58	42	30	52	38	27
			Exposed	185	185	102	185	185	70	185	130	60	185	96	54	185	75	49	148	63	44	108	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	70	183	183	60	183	183	55	183	63	46	183	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	183	183	68	183	183	59	183	183	53	183	64	47	183	58	43	183	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	73	181	88	56	181	58	48	181	50	41	110	44	36	68	39	32	59	34	28
			Exposed	181	181	181	181	181	181	181	181	64	181	181	57	181	63	52	181	57	47	181	52	43	116	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	74	175	96	57	175	63	50	61	55	43	54	48	38	48	43	34
			Exposed	175	175	175	175	175	175	175	175	175	175	175	82	175	175	62	175	91	57	175	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	185	185	136	185	185	82	185	162	63	185	112	57	185	86	52	185	69	47	130	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	185	85	51	173	65	46	112	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	183	183	183	183	183	62	183	183	56	183	82	50	183	62	45	183	56	41	183	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	183	61	45	183	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	181	181	181	181	181	181	181	181	81	181	181	61	181	74	55	181	61	50	181	55	46	181	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	181	72	55	181	59	49	181	53	44	181	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	175	175	175	68	175	121	60	175	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	175	175	67	175	104	59	175	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	185	185	67	185	122	59	185	89	53	185	70	47	129	61	43	96	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	127	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	183	183	58	183	183	52	183	63	46	183	57	42	183	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	183	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	181	181	181	181	181	62	181	85	56	181	61	50	181	55	46	181	50	42	181	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	181	55	46	181	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	175	175	175	175	175	175	175	175	73	175	128	60	175	79	55	175	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	175	78	55	175	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
10	B	0-7	Interior	156	156	156	156	156	156	156	156	156	156	156	156	156	156	104	156	156	75	156	153	62	156	90	53	156	64	45	95	55	39	68	48	34	58	42	30	52	38	27
			Exposed	156	156	102	156	156	70	156	130	60	156	96	54	156	75	49	148	63	44	108	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	157	157	157	157	157	157	157	157	157	157	157	157	157	157	70	157	157	60	157	157	55	157	63	46	157	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	157	157	68	157	157	59	157	157	53	157	64	47	157	58	43	157	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	73	179	88	56	179	58	48	179	50	41	110	44	36	68	39	32	59	34	28
			Exposed	179	179	179	179	179	179	179	179	64	179	179	57	179	63	52	179	57	47	179	52	43	116	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	74	175	96	57	175	63	50	61	55	43	54	48	38	48	43	34
			Exposed	175	175	175	175	175	175	175	175	175	175	175	82	175	175	62	175	91	57	175	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	156	156	136	156	156	82	156	156	63	156	112	57	156	86	52	156	69	47	130	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	156	85	51	156	65	46	112	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	157	157	157	157	157	62	157	157	56	157	82	50	157	62	45	157	56	41	157	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	157	61	45	157	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	179	179	179	179	179	179	179	179	81	179	179	61	179	74	55	179	61	50	179	55	46	179	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	179	72	55	179	59	49	179	53	44	179	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	175	175	175	175	175	175	175	175	175	175	175	175	175	175	68	175	121	60	175	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	175	175	67	175	104	59	175	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	156	156	67	156	122	59	156	89	53	156	70	47	129	61	43	96	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	127	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	157	157	58	157	157	52	157	63	46	157	57	42	157	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	157	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	181	181	181	181	181	62	181	85	56	181	61	50	181	55	46	181	50	42	181	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	181	55	46	181	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	175	175	175	175	175	175	175	175	73	175	128	60	175	79	55	175	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	175	78	55	175	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
20	B	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	104	115	115	75	115	115	62	115	90	53	115	64	45	95	55	39	68	48	34	58	42	30	52	38	27
			Exposed	115	115	102	115	115	70	115	115	60	115	96	54	115	75	49	115	63	44	108	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	70	116	116	60	116	116	55	116	63	46	116	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	116	116	68	116	116	59	116	116	53	116	64	47	116	58	43	116	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	73	141	88	56	141	58	48	141	50	41	110	44	36	68	39	32	59	34	28
			Exposed	141	141	141	141	141	141	141	141	64	141	141	57	141	63	52	141	57	47	141	52	43	116	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	74	138	96	57	138	63	50	61	55	43	54	48	38	48	43	34
			Exposed	138	138	138	138	138	138	138	138	138	138	138	82	138	138	62	138	91	57	138	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	115	115	115	115	115	82	115	115	63	115	112	57	115	86	52	115	69	47	115	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	115	85	51	115	65	46	112	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	116	116	116	116	116	62	116	116	56	116	82	50	116	62	45	116	56	41	116	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	116	61	45	116	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	141	141	141	141	141	141	141	141	81	141	141	61	141	74	55	141	61	50	141	55	46	141	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	141	72	55	141	59	49	141	53	44	141	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	68	138	121	60	138	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	138	138	67	138	104	59	138	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	115	115	67	115	115	59	115	89	53	115	70	47	115	61	43	96	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	115	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	116	116	58	116	116	52	116	63	46	116	57	42	116	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	116	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	147	147	147	147	147	62	147	85	56	147	61	50	147	55	46	147	50	42	147	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	147	55	46	147	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	149	149	149	149	149	149	149	149	73	149	128	60	149	79	55	149	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	149	78	55	149	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13

UNIRAC

ASCE 7-22	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	75	91	91	62	91	90	53	91	64	45	91	55	39	68	48	34	58	42	30	52	38	27
			Exposed	91	91	91	91	91	70	91	91	60	91	91	54	91	75	49	91	63	44	91	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	70	92	92	60	92	92	55	92	63	46	92	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	92	92	68	92	92	59	92	92	53	92	64	47	92	58	43	92	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	73	108	88	56	108	58	48	108	50	41	108	44	36	68	39	32	59	34	28
			Exposed	108	108	108	108	108	108	108	108	64	108	108	57	108	63	52	108	57	47	108	52	43	108	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		27-45	Interior	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	74	101	96	57	101	63	50	61	55	43	54	48	38	48	43	34
			Exposed	101	101	101	101	101	101	101	101	101	101	101	82	101	101	62	101	91	57	101	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	91	91	91	91	91	82	91	91	63	91	91	57	91	86	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	85	51	91	65	46	91	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	92	92	92	92	92	62	92	92	56	92	82	50	92	62	45	92	56	41	92	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	92	61	45	92	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	108	108	108	108	108	108	108	108	81	108	108	61	108	74	55	108	61	50	108	55	46	108	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	108	72	55	108	59	49	108	53	44	108	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	101	101	101	101	101	101	101	101	101	101	101	101	101	101	68	101	101	60	101	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	101	101	67	101	101	59	101	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	91	91	67	91	91	59	91	89	53	91	70	47	91	61	43	91	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	91	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	92	92	58	92	92	52	92	63	46	92	57	42	92	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	92	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	118	118	118	118	118	62	118	85	56	118	61	50	118	55	46	118	50	42	118	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	118	55	46	118	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	110	110	110	110	110	110	110	110	73	110	110	60	110	79	55	110	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	110	78	55	110	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
40	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	75	85	85	62	85	85	53	85	64	45	85	55	39	68	48	34	58	42	30	52	38	27
			Exposed	85	85	85	85	85	70	85	85	60	85	85	54	85	75	49	85	63	44	85	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	70	86	86	60	86	86	55	86	63	46	86	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	86	86	68	86	86	59	86	86	53	86	64	47	86	58	43	86	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	73	84	84	56	84	58	48	84	50	41	84	44	36	68	39	32	59	34	28
			Exposed	84	84	84	84	84	84	84	84	64	84	84	57	84	63	52	84	57	47	84	52	43	84	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	79	57	79	63	50	61	55	43	54	48	38	48	43	34
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	62	79	79	57	79	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	85	85	85	85	85	82	85	85	63	85	85	57	85	85	52	85	69	47	85	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	85	85	51	85	65	46	85	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	86	86	86	86	86	62	86	86	56	86	82	50	86	62	45	86	56	41	86	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	86	61	45	86	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	84	84	84	84	84	84	84	84	81	84	84	61	84	74	55	84	61	50	84	55	46	84	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	84	72	55	84	59	49	84	53	44	84	48	40	84	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	68	79	79	60	79	79	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	79	79	67	79	79	59	79	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	91	91	67	91	91	59	91	89	53	91	70	47	91	61	43	91	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	91	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	92	92	58	92	92	52	92	63	46	92	57	42	92	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	92	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	92	92	92	92	92	62	92	85	56	92	61	50	92	55	46	92	50	42	92	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	92	55	46	92	49	41	92	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	87	87	87	87	87	87	87	87	73	87	87	60	87	79	55	87	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	87	78	55	87	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
50	B	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	62	73	73	53	73	64	45	73	55	39	68	48	34	58	42	30	52	38	27
			Exposed	73	73	73	73	73	70	73	73	60	73	73	54	73	73	49	73	63	44	73	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	70	74	74	60	74	74	55	74	63	46	74	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	74	74	68	74	74	59	74	74	53	74	64	47	74	58	43	74	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	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	56	69	58	48	69	50	41	69	44	36	68	39	32	59	34	28
			Exposed	69	69	69	69	69	69	69	69	64	69	69	57	69	63	52	69	57	47	69	52	43	69	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	57	65	63	50	61	55	43	54	48	38	48	43	34
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	57	65	65	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	73	73	73	73	73	73	73	73	63	73	73	57	73	73	52	73	69	47	73	61	43	73	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	73	73	51	73	65	46	73	58	41	73	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	74	74	74	74	74	62	74	74	56	74	74	50	74	62	45	74	56	41	74	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	74	61	45	74	55	40	74	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	61	69	69	55	69	61	50	69	55	46	69	47	39	69	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	69	69	55	69	59	49	69	53	44	69	48	40	69	43	36	69	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	65	55	65	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	65	65	65	65	65	59	65	65	53	65	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	79	79	67	79	79	59	79	79	53	79	70	47	79	61	43	79	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	79	61	43	79	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	80	80	58	80	80	52	80	63	46	80	57	42	80	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	80	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	76	76	76	76	76	62	76	76	56	76	61	50	76	55	46	76	50	42	76	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	76	55	46	76	49	41	76	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	60	72	72	55	72	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	72	72	55	72	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13

UNIRAC

ASCE 7-22	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	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	45	61	55	39	61	48	34	58	42	30	52	38	27
			Exposed	61	61	61	61	61	61	61	61	60	61	61	54	61	61	49	61	61	44	61	58	41	61	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	55	62	62	46	62	54	40	62	46	34	56	41	30	49	36	26	43	32	23			
			Exposed	62	62	62	62	62	59	62	62	53	62	62	47	62	58	43	62	53	39	62	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	56	58	58	48	58	50	41	58	44	36	58	39	32	58	34	28			
			Exposed	58	58	58	58	58	58	58	58	58	58	58	57	58	58	52	58	57	47	58	52	43	58	44	37	58	38	31	56	33	27	49	29	24	43	25	21	38	22	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	50	55	55	43	54	48	38	48	43	34
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	57	61	61	52	61	61	47	61	61	43	61	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	61	61	51	61	61	46	61	58	41	61	53	37	61	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	62	62	62	62	62	62	62	62	56	62	62	50	62	62	45	62	56	41	62	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	62	61	45	62	55	40	62	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	50	58	55	46	58	47	39	58	40	33	58	35	29	52	30	25	46	27	22	40	24	20
			Exposed	58	58	55	58	58	49	58	53	44	58	48	40	58	43	36	58	40	33	58	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	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	46	55	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	55	55	55	55	55	55	55	55	53	55	55	47	55	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	68	68	67	68	68	59	68	68	53	68	68	47	68	61	43	68	55	39	68	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	68	61	43	68	54	38	68	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	69	69	58	69	69	52	69	63	46	69	57	42	69	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	69	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	64	64	64	64	64	62	64	64	56	64	61	50	64	55	46	64	50	42	64	46	38	64	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	64	55	46	64	49	41	64	44	36	64	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	60	61	61	55	61	61	50	61	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	61	61	55	61	61	49	61	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
70	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	45	53	53	39	53	48	34	53	42	30	52	38	27			
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	53	44	53	53	41	53	49	34	53	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	46	34	54	41	30	49	36	26	43	32	23
			Exposed	54	54	54	54	54	54	54	54	53	54	54	47	54	54	43	54	53	39	54	48	36	54	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	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	48	51	50	41	51	44	36	51	39	32	51	34	28			
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	43	51	44	37	51	38	31	51	33	27	49	29	24	43	25	21	38	22	19
		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	48	48	48	43	48	48	38	48	43	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	44	48	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	47	53	53	43	53	51	36	53	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	53	53	51	53	53	46	53	53	41	53	53	37	53	48	34	53	43	31	53	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	50	54	54	45	54	54	41	54	51	38	54	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	54	54	45	54	54	40	54	49	36	54	44	33	54	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	46	51	47	39	51	40	33	51	35	29	51	30	25	46	27	22	40	24	20
			Exposed	51	51	51	51	51	49	51	51	44	51	48	40	51	43	36	51	40	33	51	36	30	51	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		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	48	40	48	43	34	42	38	30	37	33	27	33	30	24
			Exposed	48	48	48	48	48	48	48	48	48	48	48	47	48	48	43	48	48	39	48	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	59	59	59	59	59	59	59	59	53	59	59	47	59	59	43	59	55	39	59	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	59	59	43	59	54	38	59	48	34	59	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	60	60	58	60	60	52	60	60	46	60	57	42	60	51	38	60	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	60	51	38	60	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	56	56	56	56	56	56	56	56	56	56	56	50	56	55	46	56	50	42	56	46	38	56	39	32	56	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	56	55	46	56	49	41	56	44	36	56	40	33	56	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	46	53	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	53	53	53	53	53	49	53	53	44	53	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
80	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	45	47	47	39	47	47	34	47	42	30	47	38	27			
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	41	47	47	34	47	42	29	47	36	25	43	31	22	38	28	20	34	25	17
		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	40	47	46	34	47	41	30	47	36	26	43	32	23			
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	43	47	47	39	47	47	36	47	41	30	47	35	26	42	30	22	36	26	20	32	23	17	28	21	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	45	45	45	45	45	45	41	45	44	36	45	39	32	45	34	28
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	44	37	45	38	31	45	33	27	45	29	24	43	25	21	38	22	19
		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	43	43	43	38	43	43	34
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	38	43	41	33	40	36	28	35	32	25	31	28	22			
	C	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	43	47	47	36	47	44	31	47	38	27	46	33	23	40	29	21	36	26	18
			Exposed	47	47	47	47	47	46	47	47	41	47	47	37	47	47	34	47	43	31	47	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	45	47	47	41	47	47	38	47	43	32	47	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	47	47	45	47	47	40	47	47	36	47	44	33	47	40	30	47	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		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	39	45	40	33	45	35	29	45	30	25	45	27	22	40	24	20
			Exposed	45	45	45	45	45	45	45	45	44	45	45	40	45	43	36	45	40	33	45	36	30	45	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		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	40	43	43	34	42	38	30	37	33	27	33	30	24			
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	47	52	52	43	52	52	39	52	51	36	52	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	52	52	43	52	52	38	52	48	34	52	44	31	52	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	52	52	52	52	52	52	52	52	46	52	52	42	52	51	38	52	47	34	52	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	52	51	38	52	46	34	52	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	42	49	46	38	49	39	32	49	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	49	49	46	49	49	41	49	44	36	49	40	33	49	36	30	49	33	27	49	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	47	47	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	47	47	47	47	47	47	47	47	44	47	47	40	47	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13

UNIRAC

ASCE 7-22	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	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	30	42	38	27
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	34	42	42	29	42	36	25	42	31	22	38	28	20	34	25	17
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	40	42	42	34	42	41	30	42	36	26	42	32	23			
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	36	42	41	30	42	35	26	42	30	22	36	26	20	32	23	17	28	21	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	39	32	40	34	28			
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	38	31	40	33	27	40	29	24	40	25	21	38	22	19
		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	38	38	38	34
			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	33	38	36	28	35	32	25	31	28	22
	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	36	42	42	31	42	38	27	42	33	23	40	29	21	36	26	18
			Exposed	42	42	42	42	42	42	42	42	41	42	42	37	42	42	34	42	42	31	42	40	28	42	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	38	42	42	32	42	37	27	42	32	24	38	28	21	34	25	18	30	22	16
			Exposed	42	42	42	42	42	40	42	42	36	42	42	33	42	40	30	42	37	27	42	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	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	39	40	40	33	40	35	29	40	30	25	40	27	22	40	24	20
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	33	40	36	30	40	31	25	40	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		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	34	38	38	30	37	33	27	33	30	24						
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	39	46	46	36	46	43	30	46	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	46	46	43	46	46	38	46	46	34	46	44	31	46	40	28	46	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	47	47	47	47	47	47	47	47	46	47	47	42	47	47	38	47	47	34	47	43	32	47	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	47	47	38	47	46	34	47	41	30	47	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	38	44	39	32	44	33	28	44	29	24	43	25	21	38	22	18	34	20	16
			Exposed	44	44	44	44	44	41	44	44	36	44	40	33	44	36	30	44	33	27	44	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	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	39	42	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	42	42	42	42	42	42	42	42	42	42	42	40	42	42	36	42	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
100	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	38	38	38	38	38	38	38	38	38	34	38	38	30	38	38	27
			Exposed	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	38	36	25	38	31	22	38	28	20	34	25	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	34	38	38	30	38	36	26	38	32	23						
			Exposed	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	35	26	38	30	22	36	26	20	32	23	17	28	21	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	32	36	34	28			
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	33	27	36	29	24	36	25	21	36	22	19
		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	33	34	34	28	34	32	25	31	28	22
	C	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	36	38	38	31	38	38	27	38	33	23	38	29	21	36	26	18
			Exposed	38	38	38	38	38	38	38	38	38	38	38	37	38	38	34	38	38	31	38	38	28	38	34	24	38	29	20	34	25	18	30	22	15	26	19	14	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	37	27	38	32	24	38	28	21	34	25	18	30	22	16
			Exposed	38	38	38	38	38	38	38	38	36	38	38	33	38	38	30	38	37	27	38	33	25	38	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	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	33	36	35	29	36	30	25	36	27	22	36	24	20
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	31	25	36	26	22	36	23	19	34	20	16	30	17	14	26	16	13
		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	30	34	33	27	33	30	24
			Exposed	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	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	36	42	42	30	42	37	26	42	32	22	38	28	20	33	24	17	30	22	15
			Exposed	42	42	42	42	42	38	42	42	34	42	42	31	42	40	28	42	36	26	42	33	23	38	28	20	33	24	17	28	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	34	42	42	32	42	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	42	42	38	42	42	34	42	41	30	42	37	27	42	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	38	40	39	32	40	33	28	40	29	24	40	25	21	38	22	18	34	20	16
			Exposed	40	40	40	40	40	40	40	40	36	40	40	33	40	36	30	40	33	27	40	30	25	40	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	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	33	38	36	29	35	32	25	31	28	22	28	25	20			
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	33	38	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13

UNIRAC

ASCE 7-22	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	95	113	113	78	113	113	65	113	93	55	113	79	48	113	69	42	99	60	38	76	47	32	60	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	113	79	47	113	66	41	92	56	36	78	49	33	67	42	30	58	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	112	112	84	112	112	67	112	98	55	112	80	46	112	66	40	112	56	37	87	48	33	62	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	112	65	40	112	53	36	80	44	32	65	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	110	110	110	110	110	110	110	110	80	110	96	65	110	78	54	110	65	46	110	55	40	99	41	34	75	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	110	77	54	110	62	44	110	51	39	110	42	35	86	38	32	74	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	107	107	107	107	107	107	107	107	107	107	107	86	107	107	72	107	88	61	107	76	53	75	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	107	107	71	107	85	59	98	71	49	78	60	42	65	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	113	86	52	113	72	43	103	61	39	86	53	35	73	46	31	64	41	29	56	37	26	44	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	36	25	45	32	23	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	73	42	112	59	38	89	49	34	72	42	30	60	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	60	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	110	86	59	110	69	48	110	56	41	110	47	37	95	41	33	81	37	30	69	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	95	40	33	78	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	107	107	79	107	93	65	107	78	54	88	65	45	72	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	71	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	113	65	40	89	55	36	75	47	32	64	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	97	52	35	76	43	31	62	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	110	60	43	110	49	38	98	41	34	82	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	107	83	57	93	68	47	75	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
10	B	0-7	Interior	95	95	95	95	95	78	95	95	65	95	93	55	95	79	48	95	69	42	95	60	38	76	47	32	60	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	95	79	47	95	66	41	92	56	36	78	49	33	67	42	30	58	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	96	96	84	96	96	67	96	96	55	96	80	46	96	66	40	96	56	37	87	48	33	62	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	96	65	40	96	53	36	80	44	32	65	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	109	109	109	109	109	109	109	109	80	109	96	65	109	78	54	109	65	46	109	55	40	99	41	34	75	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	109	77	54	109	62	44	109	51	39	109	42	35	86	38	32	74	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	107	107	107	107	107	107	107	107	107	107	107	86	107	107	72	107	88	61	107	76	53	75	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	107	107	71	107	85	59	98	71	49	78	60	42	65	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	95	86	52	95	72	43	95	61	39	86	53	35	73	46	31	64	41	29	56	37	26	44	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	36	25	45	32	23	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	96	73	42	96	59	38	89	49	34	72	42	30	60	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	60	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	109	86	59	109	69	48	109	56	41	109	47	37	95	41	33	81	37	30	69	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	95	40	33	78	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	107	107	79	107	93	65	107	78	54	88	65	45	72	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	71	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	95	65	40	89	55	36	75	47	32	64	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	96	52	35	76	43	31	62	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	110	60	43	110	49	38	98	41	34	82	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	107	83	57	93	68	47	75	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
20	B	0-7	Interior	70	70	70	70	70	70	70	70	65	70	70	55	70	70	48	70	69	42	70	60	38	70	47	32	60	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	70	70	47	70	66	41	70	56	36	70	49	33	67	42	30	58	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	71	71	71	71	71	67	71	71	55	71	71	46	71	66	40	71	56	37	71	48	33	62	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	71	65	40	71	53	36	71	44	32	65	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	86	86	86	86	86	86	86	86	80	86	86	65	86	78	54	86	65	46	86	55	40	86	41	34	75	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	86	77	54	86	62	44	86	51	39	86	42	35	86	38	32	74	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	72	84	84	61	84	76	53	75	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	84	84	71	84	84	59	84	71	49	78	60	42	65	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	70	70	52	70	70	43	70	61	39	70	53	35	70	46	31	64	41	29	56	37	26	44	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	70	45	31	61	40	28	52	36	25	45	32	23	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	71	71	42	71	59	38	71	49	34	71	42	30	60	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	60	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	86	86	59	86	69	48	86	56	41	86	47	37	86	41	33	81	37	30	69	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	86	40	33	78	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	84	84	79	84	84	65	84	78	54	84	65	45	72	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	71	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	70	65	40	70	55	36	70	47	32	64	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	71	52	35	71	43	31	62	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	90	60	43	90	49	38	90	41	34	82	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	91	83	57	91	68	47	75	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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	55	56	56	48	56	56	42	56	56	38	56	47	32	56	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	56	56	47	56	56	41	56	56	36	56	49	33	56	42	30	56	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	56	56	56	56	56	56	56	56	55	56	56	46	56	56	40	56	56	37	56	48	33	56	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	56	56	40	56	53	36	56	44	32	56	39	29	54	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		20-27	Interior	66	66	66	66	66	66	66	66	66	66	66	65	66	66	54	66	65	46	66	55	40	66	41	34	66	35	29	59	31	25	48	27	22	40	23	19	36	21	17
			Exposed	66	66	54	66	62	44	66	51	39	66	42	35	66	38	32	66	35	29	63	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	53	62	58	41	56	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	62	62	62	62	62	59	62	62	49	62	60	42	62	51	38	54	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	56	56	52	56	56	43	56	56	39	56	53	35	56	46	31	56	41	29	56	37	26	44	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	36	25	45	32	23	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	56	56	42	56	56	38	56	49	34	56	42	30	56	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	56	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	66	66	59	66	66	48	66	56	41	66	47	37	66	41	33	66	37	30	66	34	28	53	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	66	40	33	66	36	30	65	32	27	55	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	62	62	62	62	62	62	62	62	54	62	62	45	62	56	40	60	48	37	51	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	62	56	40	58	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	56	56	40	56	55	36	56	47	32	56	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	56	52	35	56	43	31	56	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	72	60	43	72	49	38	72	41	34	72	37	31	69	34	28	60	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	69	34	28	57	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	67	67	57	67	67	47	67	57	41	61	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
40	B	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	42	52	52	38	52	47	32	52	39	27	48	34	24	40	29	21	35	26	18	31	23	16
			Exposed	52	52	47	52	52	41	52	52	36	52	49	33	52	42	30	52	38	27	51	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	52	52	52	52	52	52	52	52	52	52	52	46	52	52	40	52	52	37	52	48	33	52	38	28	47	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	52	52	40	52	52	36	52	44	32	52	39	29	52	35	26	46	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	34	51	35	29	51	31	25	48	27	22	40	23	19	36	21	17
			Exposed	51	51	51	51	51	44	51	51	39	51	42	35	51	38	32	51	35	29	51	32	26	49	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	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	41	48	45	35	43	38	30	37	33	26	33	29	23	29	26	21
			Exposed	48	48	48	48	48	48	48	48	48	48	48	42	48	48	38	48	44	35	46	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	52	52	52	52	52	43	52	52	39	52	52	35	52	46	31	52	41	29	52	37	26	44	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	52	45	31	52	40	28	52	36	25	45	32	23	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	52	52	42	52	52	38	52	49	34	52	42	30	52	38	28	51	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	52	37	27	49	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	51	51	51	51	51	48	51	51	41	51	47	37	51	41	33	51	37	30	51	34	28	51	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	51	40	33	51	36	30	51	32	27	51	29	24	47	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	45	48	48	40	48	48	37	48	42	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	48	48	40	48	47	36	47	40	32	41	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	56	56	40	56	55	36	56	47	32	56	41	29	56	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	55	37	26	47	33	23	41	29	21	37	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	56	52	35	56	43	31	56	38	28	51	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	56	56	43	56	49	38	56	41	34	56	37	31	56	34	28	56	31	25	52	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	56	34	28	56	30	25	48	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	53	53	53	53	53	47	53	53	41	53	49	37	51	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
50	B	0-7	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	38	44	44	32	44	39	27	44	34	24	40	29	21	35	26	18	31	23	16
			Exposed	44	44	44	44	44	41	44	44	36	44	44	33	44	42	30	44	38	27	44	35	25	41	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	40	45	45	37	45	45	33	45	38	28	45	33	24	39	28	21	34	25	18	30	22	16	26	19	14
			Exposed	45	45	40	45	45	36	45	44	32	45	39	29	45	35	26	45	32	24	41	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	34	42	35	29	42	31	25	42	27	22	40	23	19	36	21	17
			Exposed	42	42	42	42	42	42	42	42	39	42	42	35	42	38	32	42	35	29	42	32	26	42	27	22	40	23	19	34	20	16	30	17	14	26	15	13	23	14	11
		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	35	40	38	30	37	33	26	33	29	23	29	26	21
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	35	40	40	32	38	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	44	44	44	44	44	43	44	44	39	44	44	35	44	44	31	44	41	29	44	37	26	44	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	44	44	31	44	40	28	44	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	11	8	14	10	7
		7-20	Interior	45	45	42	45	45	38	45	45	34	45	42	30	45	38	28	45	34	25	43	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	45	37	27	45	33	25	41	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	42	42	42	42	42	42	42	42	41	42	42	37	42	41	33	42	37	30	42	34	28	42	28	23	42	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	42	40	33	42	36	30	42	32	27	42	29	24	42	26	22	41	24	20	38	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	40	33	40	36	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	40	40	40	40	40	36	40	40	32	40	37	29	37	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	48	48	40	48	48	36	48	47	32	48	41	29	48	37	26	48	34	24	43	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	48	37	26	47	33	23	41	29	21	37	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	43	31	49	38	28	49	34	25	43	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	43	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	46	46	43	46	46	38	46	41	34	46	37	31	46	34	28	46	31	25	46	28	23	41	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	46	34	28	46	30	25	46	27	22	42	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	44	44	44	44	44	44	44	44	41	44	44	37	44	42	33	43	38	30	39	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	44	42	33	42	38	30	38	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	32	37	37	27	37	34	24	37	29	21	35	26	18	31	23	16
			Exposed	37	37	37	37	37	37	37	37	36	37	37	33	37	37	30	37	37	27	37	35	25	37	30	21	35	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	38	38	33	38	38	28	38	33	24	38	28	21	34	25	18	30	22	16	26	19	14
			Exposed	38	38	38	38	38	36	38	38	32	38	38	29	38	35	26	38	32	24	38	29	22	34	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	9
		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	35	29	36	31	25	36	27	22	36	23	19	36	21	17
			Exposed	36	36	36	36	36	36	36	36	36	36	36	35	36	36	32	36	35	29	36	32	26	36	27	22	36	23	19	34	20	16	30	17	14	26	15	13	23	14	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	33	26	33	29	23	29	26	21
			Exposed	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	27	32	29	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	37	37	37	37	37	37	37	37	37	37	37	35	37	37	31	37	37	29	37	37	26	37	31	22	37	27	19	32	23	16	28	20	14	24	18	12	22	16	11
			Exposed	37	37	31	37	37	28	37	36	25	37	32	23	37	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	38	38	38	38	38	38	38	38	34	38	38	30	38	38	28	38	34	25	38	31	23	36	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	38	37	27	38	33	25	38	30	22	37	27	20	34	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	34	28	36	28	23	36	24	20	36	21	17	31	18	15	28	16	13	25	14	12
			Exposed	36	36	33	36	36	30	36	32	27	36	29	24	36	26	22	36	24	20	36	22	18	32	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	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	33	34	28	34	31	24	29	26	21	26	23	18	23	20	16	20	18	14
			Exposed	34	34	34	34	34	34	34	34	32	34	34	29	34	33	26	34	30	24	31	28	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	41	41	40	41	41	36	41	41	32	41	41	29	41	37	26	41	34	24	41	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	41	37	26	41	33	23	41	29	21	37	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	42	42	35	42	42	31	42	38	28	42	34	25	42	31	23	39	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	42	31	23	38	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	39	39	39	39	39	38	39	39	34	39	37	31	39	34	28	39	31	25	39	28	23	39	24	20	35	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	39	34	28	39	30	25	39	27	22	39	24	20	38	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	37	30	37	35	28	33	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	37	37	33	37	37	30	37	34	27	34	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
70	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	27	32	32	24	32	29	21	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	30	21	32	25	18	30	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	28	33	33	24	33	28	21	33	25	18	30	22	16	26	19	14
			Exposed	33	33	33	33	33	33	33	33	32	33	33	29	33	33	26	33	32	24	33	29	22	33	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	29	31	31	25	31	27	22	31	23	19	31	21	17	31	21	17
			Exposed	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	26	31	27	22	31	23	19	31	20	16	30	17	14	26	15	13	23	14	11
		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	26	29	29	23	29	26	21
			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	23	28	25	20	24	22	17	21	19	15	19	17	13
	C	0-7	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	31	32	32	29	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	23	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	33	33	33	33	33	33	33	33	33	33	33	30	33	33	28	33	33	25	33	31	23	33	26	19	31	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	33	33	27	33	33	25	33	30	22	33	27	20	33	24	18	31	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		20-27	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	28	31	28	23	31	24	20	31	21	17	31	18	15	28	16	13	25	14	12
			Exposed	31	31	31	31	31	30	31	31	27	31	29	24	31	26	22	31	24	20	31	22	18	31	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	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	24	29	26	21	26	23	18	23	20	16	20	18	14	20	18	14
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	D	0-7	Interior	36	36	36	36	36	36	36	36	32	36	36	29	36	36	26	36	34	24	36	31	22	36	26	18	31	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	36	36	26	36	33	23	36	29	21	36	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	36	36	35	36	36	31	36	36	28	36	34	25	36	31	23	36	28	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	36	31	23	36	28	20	34	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	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	34	20	17	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	34	34	28	34	30	25	34	27	22	34	24	20	34	22	18	34	20	16	31	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	32	32	28	32	30	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	32	32	32	32	32	30	32	32	27	32	30	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
80	B	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	24	28	28	21	28	26	18	28	23	16
			Exposed	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	25	28	28	21	28	25	18	28	22	15	26	19	13	23	17	12	20	15	10
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	24	29	28	21	29	25	18	29	22	16	26	19	14
			Exposed	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26	29	29	24	29	29	22	29	25	18	29	21	16	25	18	14	22	16	12	19	14	10	17	12	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	27	27	27	25	27	27	22	27	23	19	27	21	17
			Exposed	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	23	19	27	20	16	27	17	14	26	15	13	23	14	11
		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	21
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	23	26	25	20	24	22	17	21	19	15	19	15	19	17	13
	C	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	26	28	28	22	28	27	19	28	23	16	28	20	14	24	18	12	22	16	11
			Exposed	28	28	28	28	28	25	28	28	23	28	28	20	28	26	19	28	24	17	28	20	14	24	17	12	21	15	11	18	13	9	16	11	8	14	10	7
		7-20	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	25	29	29	23	29	26	19	29	22	17	27	19	14	23	17	12	20	15	11	18	13	10
			Exposed	29	29	27	29	29	25	29	29	22	29	27	20	29	24	18	29	22	16	28	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	6
		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	24	27	24	20	27	21	17	27	18	15	27	16	13	25	14	12
			Exposed	27	27	27	27	27	27	27	27	27	27	27	24	27	26	22	27	24	20	27	22	18	27	19	15	27	16	13	23	14	11	20	12	10	18	10	9	16	9	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	24	26	26	21	26	23	18	23	20	16	20	18	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	23	18	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	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	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	31	31	26	31	31	23	31	29	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	32	32	32	32	32	31	32	32	28	32	32	25	32	31	23	32	28	21	32	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	32	31	23	32	28	20	32	25	18	31	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	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	30	17	14	26	15	13	23	13	11	20	12	10
			Exposed	30	30	28	30	30	25	30	27	22	30	24	20	30	22	18	30	20	16	30	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	23	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	29	29	29	29	29	29	29	29	27	29	29	24	29	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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
90	B	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	21	25	25	18	25	23	16
			Exposed	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	25	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	26	26	26	24	26	26	21	26	25	18	26	22	16	26	19	14
			Exposed	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	25	18	26	21	16	25	18	14	22	16	12	19	14	10	17	12	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	24	24	24	22	24	23	19	24	21	17
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	23	19	24	20	16	24	17	14	24	15	13	23	14	11
		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	23	23	23	21
			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	23	23	23	20	23	22	17	21	19	15	19	17	13
	C	0-7	Interior	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	22	25	25	19	25	23	16	25	20	14	24	18	12	22	16	11
			Exposed	25	25	25	25	25	25	25	25	25	25	25	23	25	25	20	25	25	19	25	24	17	25	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	26	19	26	22	17	26	19	14	23	17	12	20	15	11	18	13	10
			Exposed	26	26	26	26	26	25	26	26	22	26	26	20	26	24	18	26	22	16	26	20	15	24	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	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	23	24	24	20	24	21	17	24	18	15	24	16	13	24	14	12
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	19	15	24	16	13	23	14	11	20	12	10	18	10	9	16	9	8
		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	20	16	20	18	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	22	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	D	0-7	Interior	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	24	28	28	22	28	26	18	28	22	16	26	19	13	23	17	12	20	15	10	18	13	9
			Exposed	28	28	26	28	28	23	28	28	21	28	27	19	28	24	17	28	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	29	29	29	29	29	29	29	29	28	29	29	25	29	29	23	29	28	21	29	26	19	29	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	29	29	23	29	28	20	29	25	18	29	22	16	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	24	20	27	20	17	27	17	14	26	15	13	23	13	11	20	12	10
			Exposed	27	27	27	27	27	25	27	27	22	27	24	20	27	22	18	27	20	16	27	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	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	23	26	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
100	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	23	23	23	23	23	23	23	23	23	21	23	23	18	23	23	16
			Exposed	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	23	19	13	23	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	23	18	23	22	16	23	19	14	23	19	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	21	16	23	18	14	22	16	12	19	14	10	17	12	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	22	22	22	19	22	21	17
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	20	16	22	17	14	22	15	13	22	14	11
		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	21	21	21	21
			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	20	21	21	17	21	19	15	19	17	13	19	17	13
	C	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	16	23	20	14	23	18	12	22	16	11
			Exposed	23	23	23	23	23	23	23	23	23	23	23	20	23	23	19	23	23	17	23	20	14	23	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	22	17	23	19	14	23	17	12	20	15	11	18	13	10
			Exposed	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	22	16	23	20	15	23	17	13	20	15	11	17	13	9	15	11	8	13	10	7	12	9	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	21	17	22	18	15	22	16	13	22	14	12			
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	19	15	22	16	13	22	14	11	20	12	10	18	10	9	16	9	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	18	21	20	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	18	21	20	16	19	17	14	17	15	12	15	13	10	13	12	9
	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	18	25	22	16	25	19	13	23	17	12	20	15	10	18	13	9
			Exposed	25	25	25	25	25	23	25	25	21	25	25	19	25	24	17	25	22	15	25	20	14	23	17	12	20	14	10	17	12	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	26	21	26	26	19	26	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	26	26	23	26	26	20	26	25	18	26	22	16	26	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	10	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	20	17	24	17	14	24	15	13	23	13	11	20	12	10
			Exposed	24	24	24	24	24	24	24	24	22	24	24	20	24	22	18	24	20	16	24	18	15	24	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	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	22	17	21	19	15	19	17	13	17	15	12			
			Exposed	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8

UNIRAC

ASCE 7-22	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	113	188	188	80	188	167	64	188	95	54	173	66	46	101	56	40	71	49	35	60	43	31	53	38	27
			Exposed	188	188	111	188	188	74	188	140	61	188	101	55	188	79	50	162	65	45	115	59	42	73	50	35	59	42	30	51	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	79	187	187	61	187	187	56	187	64	47	187	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	187	187	77	187	187	60	187	187	54	187	68	48	187	60	44	187	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	90	185	185	57	185	59	49	185	51	42	123	45	37	73	39	33	60	35	29
			Exposed	185	185	185	185	185	185	185	185	65	185	185	59	185	64	53	185	59	48	185	54	44	133	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		27-45	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	81	178	106	59	178	64	51	63	56	44	55	49	39	49	44	35
			Exposed	178	178	178	178	178	178	178	178	178	178	178	93	178	178	64	178	99	58	178	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	188	188	164	188	188	88	188	178	65	188	119	58	188	90	53	188	72	48	140	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	188	89	53	188	68	47	120	60	42	89	54	38	70	49	34	61	44	31	56	41	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	187	57	187	100	51	187	63	46	187	57	42	187	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	187	63	46	187	56	41	187	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	185	185	185	185	185	185	185	185	185	185	185	62	185	89	56	185	62	51	185	57	47	185	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	185	85	56	185	61	50	185	54	45	185	49	40	117	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	74	178	148	61	178	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	178	178	73	178	118	60	178	74	54	178	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	188	188	71	188	130	60	188	94	54	188	73	48	139	62	44	102	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	137	62	44	95	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	187	187	59	187	187	53	187	64	47	187	58	43	187	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	187	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	185	185	185	185	185	64	185	185	57	185	63	52	185	57	47	185	52	43	185	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	185	56	47	185	50	42	130	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	178	178	178	178	178	178	178	178	80	178	178	62	178	86	56	178	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	178	85	56	178	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
10	B	0-7	Interior	159	159	159	159	159	159	159	159	159	159	159	159	159	159	113	159	159	80	159	159	64	159	95	54	159	66	46	101	56	40	71	49	35	60	43	31	53	38	27
			Exposed	159	159	111	159	159	74	159	140	61	159	101	55	159	79	50	159	65	45	115	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	161	161	161	161	161	161	161	161	161	161	161	161	161	161	79	161	161	61	161	161	56	161	64	47	161	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	161	161	77	161	161	60	161	161	54	161	68	48	161	60	44	161	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	90	183	183	57	183	59	49	183	51	42	123	45	37	73	39	33	60	35	29
			Exposed	183	183	183	183	183	183	183	183	65	183	183	59	183	64	53	183	59	48	183	54	44	133	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		27-45	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	81	178	106	59	178	64	51	63	56	44	55	49	39	49	44	35
			Exposed	178	178	178	178	178	178	178	178	178	178	178	93	178	178	64	178	99	58	178	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	159	159	159	159	159	88	159	159	65	159	119	58	159	90	53	159	72	48	140	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	159	89	53	159	68	47	120	60	42	89	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	161	161	161	161	161	63	161	161	57	161	100	51	161	63	46	161	57	42	161	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	161	63	46	161	56	41	161	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	183	183	183	183	183	183	183	183	183	183	183	62	183	89	56	183	62	51	183	57	47	183	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	183	85	56	183	61	50	183	54	45	183	49	40	117	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	178	178	178	178	178	178	178	178	178	178	178	178	178	178	74	178	148	61	178	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	178	178	73	178	118	60	178	74	54	178	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	159	159	71	159	130	60	159	94	54	159	73	48	139	62	44	102	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	137	62	44	95	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	161	161	59	161	161	53	161	64	47	161	58	43	161	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	161	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	185	185	185	185	185	64	185	185	57	185	63	52	185	57	47	185	52	43	185	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	185	56	47	185	50	42	130	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	178	178	178	178	178	178	178	178	80	178	178	62	178	86	56	178	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	178	85	56	178	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
20	B	0-7	Interior	118	118	118	118	118	118	118	118	118	118	118	118	118	118	113	118	118	80	118	118	64	118	95	54	118	66	46	101	56	40	71	49	35	60	43	31	53	38	27
			Exposed	118	118	111	118	118	74	118	118	61	118	101	55	118	79	50	118	65	45	115	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	119	119	119	119	119	119	119	119	119	119	119	119	119	119	79	119	119	61	119	119	56	119	64	47	119	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	119	119	77	119	119	60	119	119	54	119	68	48	119	60	44	119	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	90	144	144	57	144	59	49	144	51	42	123	45	37	73	39	33	60	35	29
			Exposed	144	144	144	144	144	144	144	144	65	144	144	59	144	64	53	144	59	48	144	54	44	133	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	81	141	106	59	141	64	51	63	56	44	55	49	39	49	44	35
			Exposed	141	141	141	141	141	141	141	141	141	141	141	93	141	141	64	141	99	58	141	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	118	118	118	118	118	88	118	118	65	118	118	58	118	90	53	118	72	48	118	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	118	89	53	118	68	47	118	60	42	89	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	119	119	119	119	119	63	119	119	57	119	100	51	119	63	46	119	57	42	119	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	119	63	46	119	56	41	119	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	144	144	144	144	144	144	144	144	144	144	144	62	144	89	56	144	62	51	144	57	47	144	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	144	85	56	144	61	50	144	54	45	144	49	40	117	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	141	141	141	141	141	141	141	141	141	141	141	141	141	141	74	141	141	61	141	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	141	141	73	141	118	60	141	74	54	141	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	118	118	71	118	118	60	118	94	54	118	73	48	118	62	44	102	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	118	62	44	95	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	119	119	59	119	119	53	119	64	47	119	58	43	119	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	119	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	151	151	151	151	151	64	151	151	57	151	63	52	151	57	47	151	52	43	151	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	151	56	47	151	50	42	130	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	153	153	153	153	153	153	153	153	80	153	153	62	153	86	56	153	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	153	85	56	153	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	80	94	94	64	94	94	54	94	66	46	94	56	40	71	49	35	60	43	31	53	38	27
			Exposed	94	94	94	94	94	74	94	94	61	94	94	55	94	79	50	94	65	45	94	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	94	94	94	94	94	94	94	94	94	94	94	94	94	94	79	94	94	61	94	94	56	94	64	47	94	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	94	94	77	94	94	60	94	94	54	94	68	48	94	60	44	94	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		20-27	Interior	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	90	111	111	57	111	59	49	111	51	42	111	45	37	73	39	33	60	35	29
			Exposed	111	111	111	111	111	111	111	111	65	111	111	59	111	64	53	111	59	48	111	54	44	111	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	81	103	103	59	103	64	51	63	56	44	55	49	39	49	44	35
			Exposed	103	103	103	103	103	103	103	103	103	103	103	93	103	103	64	103	99	58	103	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	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	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	94	89	53	94	68	47	94	60	42	89	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	94	94	94	94	94	63	94	94	57	94	94	51	94	63	46	94	57	42	94	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	94	63	46	94	56	41	94	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	111	111	111	111	111	111	111	111	111	111	111	62	111	89	56	111	62	51	111	57	47	111	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	111	85	56	111	61	50	111	54	45	111	49	40	111	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	103	103	103	103	103	103	103	103	103	103	103	103	103	103	74	103	103	61	103	86	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	103	103	73	103	103	60	103	74	54	103	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	94	94	71	94	94	60	94	94	54	94	73	48	94	62	44	94	57	40	81	52	37	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	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	94	94	59	94	94	53	94	64	47	94	58	43	94	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	94	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	121	121	121	121	121	64	121	121	57	121	63	52	121	57	47	121	52	43	121	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	121	56	47	121	50	42	121	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	112	112	112	112	112	112	112	112	80	112	112	62	112	86	56	112	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	112	85	56	112	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
40	B	0-7	Interior	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	80	87	87	64	87	87	54	87	66	46	87	56	40	71	49	35	60	43	31	53	38	27
			Exposed	87	87	87	87	87	74	87	87	61	87	87	55	87	79	50	87	65	45	87	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	88	88	88	88	88	88	88	88	88	88	88	88	88	88	79	88	88	61	88	88	56	88	64	47	88	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	88	88	77	88	88	60	88	88	54	88	68	48	88	60	44	88	54	40	86	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	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	57	86	59	49	86	51	42	86	45	37	73	39	33	60	35	29
			Exposed	86	86	86	86	86	86	86	86	65	86	86	59	86	64	53	86	59	48	86	54	44	86	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	59	81	64	51	63	56	44	55	49	39	49	44	35
			Exposed	81	81	81	81	81	81	81	81	81	81	81	81	81	81	64	81	81	58	81	71	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	87	87	87	87	87	87	87	87	65	87	87	58	87	87	53	87	72	48	87	62	44	84	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	87	87	53	87	68	47	87	60	42	87	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	88	88	88	88	88	63	88	88	57	88	88	51	88	63	46	88	57	42	88	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	88	63	46	88	56	41	88	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	86	86	86	86	86	86	86	86	86	86	86	62	86	86	56	86	62	51	86	57	47	86	48	40	82	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	86	85	56	86	61	50	86	54	45	86	49	40	86	44	37	79	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	81	81	81	81	81	81	81	81	81	81	81	81	81	81	74	81	81	61	81	81	56	78	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	81	81	73	81	81	60	81	74	54	81	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	93	93	71	93	93	60	93	93	54	93	73	48	93	62	44	93	57	40	81	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	93	62	44	93	55	39	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	94	94	59	94	94	53	94	64	47	94	58	43	94	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	94	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	95	95	95	95	95	64	95	95	57	95	63	52	95	57	47	95	52	43	95	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	95	56	47	95	50	42	95	45	37	81	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	89	89	89	89	89	89	89	89	80	89	89	62	89	86	56	89	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	89	85	56	89	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
50	B	0-7	Interior	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	64	75	75	54	75	66	46	75	56	40	71	49	35	60	43	31	53	38	27
			Exposed	75	75	75	75	75	74	75	75	61	75	75	55	75	75	50	75	65	45	75	59	42	73	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	61	76	76	56	76	64	47	76	55	41	66	47	35	57	41	31	50	36	27	44	32	24
			Exposed	76	76	76	76	76	60	76	76	54	76	68	48	76	60	44	76	54	40	76	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	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	57	71	59	49	71	51	42	71	45	37	71	39	33	60	35	29
			Exposed	71	71	71	71	71	71	71	71	65	71	71	59	71	64	53	71	59	48	71	54	44	71	45	37	69	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		27-45	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	59	67	64	51	63	56	44	55	49	39	49	44	35
			Exposed	67	67	67	67	67	67	67	67	67	67	67	67	67	67	64	67	67	58	67	67	53	63	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	75	75	75	75	75	75	75	75	65	75	75	58	75	75	53	75	72	48	75	62	44	75	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	75	75	53	75	68	47	75	60	42	75	54	38	70	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	76	76	76	76	76	63	76	76	57	76	76	51	76	63	46	76	57	42	76	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	76	63	46	76	56	41	76	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	71	71	71	71	71	71	71	71	71	71	71	62	71	71	56	71	62	51	71	57	47	71	48	40	71	41	34	61	35	29	53	31	26	47	27	23	41	24	20
			Exposed	71	71	56	71	61	50	71	54	45	71	49	40	71	44	37	71	40	33	63	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		27-45	Interior	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	61	67	67	56	67	60	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	67	67	67	67	67	60	67	67	54	67	61	49	62	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	81	81	71	81	81	60	81	81	54	81	73	48	81	62	44	81	57	40	81	52	37	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	73	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	81	81	59	81	81	53	81	64	47	81	58	43	81	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	81	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	78	78	78	78	78	64	78	78	57	78	63	52	78	57	47	78	52	43	78	47	39	75	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	78	56	47	78	50	42	78	45	37	78	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	73	73	73	73	73	73	73	73	73	73	73	62	73	73	56	73	65	51	70	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	73	73	56	73	63	50	63	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	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	60	43	31	53	38	27
			Exposed	63	63	63	63	63	63	63	63	61	63	63	55	63	63	50	63	63	45	63	59	42	63	50	35	59	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		7-20	Interior	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	61	64	64	56	64	64	47	64	55	41	64	47	35	57	41	31	50	36	27	44	32	24
			Exposed	64	64	64	64	64	60	64	64	54	64	64	48	64	60	44	64	54	40	64	50	37	58	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		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	57	60	59	49	60	51	42	60	45	37	60	39	33	60	35	29
			Exposed	60	60	60	60	60	60	60	60	60	60	60	59	60	60	53	60	59	48	60	54	44	60	45	37	60	39	32	57	34	28	50	29	24	44	26	21	39	23	19
		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	51	57	56	44	55	49	39	49	44	35
			Exposed	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	53	57	57	45	54	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	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	53	37	62	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	63	63	53	63	63	47	63	60	42	63	54	38	63	49	34	61	44	31	56	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	64	64	64	64	64	63	64	64	57	64	64	51	64	63	46	64	57	42	64	52	39	61	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	64	63	46	64	56	41	64	50	37	62	45	33	56	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	11
		20-27	Interior	60	60	60	60	60	60	60	60	60	60	60	60	60	60	56	60	60	51	60	57	47	60	48	40	60	41	34	60	35	29	53	31	26	47	27	23	41	24	20
			Exposed	60	60	56	60	60	50	60	54	45	60	49	40	60	44	37	60	40	33	60	37	31	54	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	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	47	57	51	41	50	44	35	43	39	31	38	34	27	34	30	24
			Exposed	57	57	57	57	57	57	57	57	54	57	57	49	57	56	44	57	51	40	52	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	69	69	69	69	69	60	69	69	54	69	69	48	69	62	44	69	57	40	69	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	69	62	44	69	55	39	69	50	35	62	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	70	70	59	70	70	53	70	64	47	70	58	43	70	52	39	67	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	70	52	39	64	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	66	66	66	66	66	64	66	66	57	66	63	52	66	57	47	66	52	43	66	47	39	66	40	33	58	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	66	56	47	66	50	42	66	45	37	66	41	34	63	37	31	58	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	51	62	59	47	56	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	62	62	56	62	62	50	62	57	45	57	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
70	B	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	49	35	54	43	31	53	38	27
			Exposed	54	54	54	54	54	54	54	54	54	54	54	54	54	54	50	54	54	45	54	54	42	54	50	35	54	42	30	51	37	26	44	32	23	39	28	20	34	25	18
		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	41	55	55	47	55	47	35	55	41	31	50	36	27	44	32	24
			Exposed	55	55	55	55	55	55	55	55	54	55	55	48	55	55	44	55	54	40	55	50	37	55	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	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	49	52	51	42	52	45	37	52	39	33	52	35	29	52	35	29
			Exposed	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	48	52	52	44	52	45	37	52	39	32	52	34	28	50	29	24	44	26	21	39	23	19
		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	44	49	49	39	49	44	35	49	44	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	45	49	49	38	47	42	33	41	37	29	36	32	26	32	29	23
	C	0-7	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	53	54	54	48	54	54	44	54	53	37	54	45	32	53	39	27	47	34	24	41	30	21	36	26	19
			Exposed	54	54	53	54	54	47	54	54	42	54	54	38	54	49	34	54	44	31	54	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	14	24	17	12
		7-20	Interior	55	55	55	55	55	55	55	55	55	55	55	51	55	55	46	55	55	42	55	52	39	55	44	33	52	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	55	55	46	55	55	41	55	50	37	55	45	33	55	41	30	51	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	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	47	52	48	40	52	41	34	52	35	29	52	31	26	47	27	23	41	24	20
			Exposed	52	52	52	52	52	50	52	52	45	52	49	40	52	44	37	52	40	33	52	37	31	52	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	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	47	49	49	41	49	44	35	43	39	31	38	34	27	34	30	24
			Exposed	49	49	49	49	49	49	49	49	49	49	49	49	49	49	44	49	49	40	49	46	37	44	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	60	60	60	60	60	60	60	60	54	60	60	48	60	60	44	60	57	40	60	52	37	60	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	60	60	44	60	55	39	60	50	35	60	45	32	56	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	61	61	59	61	61	53	61	61	47	61	58	43	61	52	39	61	48	35	60	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	61	52	39	61	47	34	57	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	57	57	57	57	57	57	57	57	57	57	57	52	57	57	47	57	52	43	57	47	39	57	40	33	57	34	28	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	57	56	47	57	50	42	57	45	37	57	41	34	57	37	31	57	34	28	53	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	51	54	54	47	54	50	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	54	54	54	54	54	50	54	54	45	54	51	40	52	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
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	46	48	48	40	48	48	35	48	43	31	48	38	27
			Exposed	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	45	48	48	42	48	48	35	48	42	30	48	37	26	44	32	23	39	28	20	34	25	18
		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	41	49	47	35	49	41	31	49	36	27	42	32	24	39	27	20
			Exposed	49	49	49	49	49	49	49	49	49	49	49	48	49	49	44	49	49	40	49	49	37	49	42	31	49	36	27	42	31	23	37	27	20	33	24	18	29	21	16
		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	44	46	46	37	46	45	37	46	39	32	46	34	28	46	29	24	44	26	21	39	23	19
			Exposed	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	44	46	45	37	46	39	32	46	34	28	46	29	24	44	26	21	39	23	19
		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	43	43	43	43	43	43	43	43	43	39	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	38	43	42	33	41	37	29	36	32	26	32	29	23	28	25	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	44	48	48	37	48	45	32	48	39	27	47	34	24	41	30	21	36	26	19
			Exposed	48	48	48	48	48	47	48	48	42	48	48	38	48	48	34	48	44	31	48	41	29	47	34	24	40	29	21	35	25	18	30	22	16	27	20	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	49	39	49	44	33	49	38	28	45	33	24	39	29	21	35	25	19	31	22	17
			Exposed	49	49	46	49	49	41	49	49	37	49	45	33	49	41	30	49	37	28	47	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	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	40	46	41	34	46	35	29	46	31	26	46	27	23	41	24	20
			Exposed	46	46	46	46	46	46	46	46	45	46	46	40	46	44	37	46	40	33	46	37	31	46	31	26	46	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		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	41	43	43	35	43	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	48	53	53	44	53	53	40	53	52	37	53	44	31	51	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	53	53	44	53	53	39	53	50	35	53	45	32	53	41	29	51	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	54	54	54	54	54	53	54	54	47	54	54	43	54	52	39	54	48	35	54	44	32	51	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	54	52	39	54	47	34	54	42	31	52	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	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	50	30	24	44	26	21	39	23	19	34	20	17
			Exposed	50	50	47	50	50	42	50	45	37	50	41	34	50	37	31	50	34	28	50	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	11
		27-45	Interior	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	47	48	48	40	48	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	48	48	48	48	48	48	48	48	45	48	48	40	48	46	37	47	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	43	43	43	43	43	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	31	43	38	27
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	35	43	42	30	43	37	26	43	32	23	39	28	20	34	25	18
		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	41	43	43	35	43	41	31	43	36	27	43	32	24			
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	42	31	43	36	27	42	31	23	37	27	20	33	24	18	29	21	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	41	41	41	37	41	39	33	41	35	29
			Exposed	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	39	32	41	34	28	41	29	24	41	26	21	39	23	19
		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	39	39	39	35
			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	38	39	39	33	39	37	29	36	32	26	32	29	23
	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	37	43	43	32	43	39	27	43	34	24	41	30	21	36	26	19
			Exposed	43	43	43	43	43	43	43	43	42	43	43	38	43	43	34	43	43	31	43	41	29	43	34	24	40	29	21	35	25	18	30	22	16	27	20	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	39	43	43	33	43	38	28	43	33	24	39	29	21	35	25	19	31	22	17
			Exposed	43	43	43	43	43	41	43	43	37	43	43	33	43	41	30	43	37	28	43	34	25	40	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	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	40	41	41	34	41	35	29	41	31	26	41	27	23	41	24	20
			Exposed	41	41	41	41	41	41	41	41	41	41	41	40	41	41	37	41	40	33	41	37	31	41	31	26	41	27	22	40	23	19	35	20	17	30	18	15	27	16	13
		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	31	38	34	27	34	30	24						
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	31	38	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	40	47	47	37	47	44	31	47	37	26	44	32	23	39	28	20	34	25	18	30	22	16
			Exposed	47	47	44	47	47	39	47	47	35	47	45	32	47	41	29	47	37	26	46	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	48	48	48	48	48	48	48	48	47	48	48	43	48	48	39	48	48	35	48	44	32	48	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	48	48	39	48	47	34	48	42	31	48	38	28	47	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	45	39	45	40	33	45	34	28	45	30	24	44	26	21	39	23	19	34	20	17
			Exposed	45	45	45	45	45	42	45	45	37	45	41	34	45	37	31	45	34	28	45	31	25	45	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	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	40	43	43	34	41	37	29	36	32	26	32	29	23	28	25	20
			Exposed	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	42	33	43	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13
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	35	39	39	31	39	38	27
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	30	39	39	30	39	37	26	39	32	23	39	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	39	31	39	36	27	39	32	24
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	31	39	36	27	39	31	23	37	27	20	33	24	18	29	21	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	33	37	35	29			
			Exposed	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	32	37	34	28	37	29	24	37	26	21	37	23	19
		27-45	Interior	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
			Exposed	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	33	35	35	29	35	32	26	32	29	23
	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	37	39	39	32	39	39	27	39	34	24	39	30	21	36	26	19
			Exposed	39	39	39	39	39	39	39	39	39	39	39	38	39	39	34	39	39	31	39	39	29	39	34	24	39	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	38	28	39	33	24	39	29	21	35	25	19	31	22	17
			Exposed	39	39	39	39	39	39	39	39	37	39	39	33	39	39	30	39	37	28	39	34	25	39	29	21	34	25	18	29	21	16	26	19	14	23	17	12	20	15	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	35	29	37	31	26	37	27	23	37	24	20			
			Exposed	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	33	37	37	31	37	31	26	37	27	22	37	23	19	35	20	17	30	18	15	27	16	13
		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	34	27	34	30	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	34	27	33	29	23	28	25	20	25	22	18	22	20	16
	D	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	37	43	43	31	43	37	26	43	32	23	39	28	20	34	25	18	30	22	16
			Exposed	43	43	43	43	43	39	43	43	35	43	43	32	43	41	29	43	37	26	43	34	24	39	29	20	34	24	17	29	21	15	25	18	13	22	16	12	20	14	10
		7-20	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	35	43	43	32	43	37	27	43	32	23	37	27	20	33	24	18	29	21	16	26	19	14
			Exposed	43	43	39	43	43	34	43	42	31	43	38	28	43	34	25	43	31	23	39	28	21	33	24	18	28	21	15	24	18	13	21	16	12	19	14	10	17	12	9
		20-27	Interior	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	39	41	41	39	41	40	33	41	34	28	41	30	24	41	26	21	39	23	19	34	20	17
			Exposed	41	41	41	41	41	41	41	41	37	41	41	34	41	37	31	41	34	28	41	31	25	41	26	22	38	22	18	33	19	16	29	17	14	25	15	12	23	13	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	34	39	37	29	36	32	26	32	29	23	28	25	20			
			Exposed	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	39	39	33	39	39	31	36	33	26	31	28	22	27	24	19	24	21	17	21	19	15	19	17	13

UNIRAC

ASCE 7-22	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	80	94	94	65	94	92	55	94	78	46	94	66	40	94	57	35	83	50	32	63	39	27	50	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	94	66	40	93	55	34	77	47	30	66	41	27	56	35	25	49	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	94	94	71	94	94	56	94	83	46	94	67	38	94	55	34	89	47	31	73	40	28	52	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	94	55	34	84	45	30	67	37	27	54	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	93	93	93	93	93	85	93	93	67	93	80	54	93	65	45	93	54	38	93	46	34	83	35	28	63	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	93	65	45	93	52	37	93	42	32	86	35	29	72	32	26	62	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	72	88	88	60	88	74	51	88	64	44	63	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	88	87	60	88	71	49	82	59	41	66	50	35	54	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	94	72	43	94	60	36	85	51	32	72	44	29	61	38	26	53	34	24	47	31	22	36	26	18	31	22	16	27	19	14	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	61	35	94	49	32	75	41	28	61	35	25	50	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	50	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	93	72	50	93	57	40	93	47	34	93	39	31	80	34	28	68	31	25	58	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	79	34	28	65	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	88	88	66	88	78	54	88	65	45	74	55	38	60	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	60	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	91	54	33	75	46	30	63	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	81	43	29	64	36	26	52	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	93	50	36	93	41	32	82	35	28	69	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	88	69	48	78	57	40	62	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
10	B	0-7	Interior	80	80	80	80	80	65	80	80	55	80	78	46	80	66	40	80	57	35	80	50	32	63	39	27	50	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	80	66	40	80	55	34	77	47	30	66	41	27	56	35	25	49	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	80	80	71	80	80	56	80	80	46	80	67	38	80	55	34	80	47	31	73	40	28	52	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	80	55	34	80	45	30	67	37	27	54	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	91	91	91	91	91	85	91	91	67	91	80	54	91	65	45	91	54	38	91	46	34	83	35	28	63	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	91	65	45	91	52	37	91	42	32	86	35	29	72	32	26	62	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	88	88	88	88	88	88	88	88	88	88	88	72	88	88	60	88	74	51	88	64	44	63	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	88	87	60	88	71	49	82	59	41	66	50	35	54	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	80	72	43	80	60	36	80	51	32	72	44	29	61	38	26	53	34	24	47	31	22	36	26	18	31	22	16	27	19	14	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	80	61	35	80	49	32	75	41	28	61	35	25	50	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	50	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	91	72	50	91	57	40	91	47	34	91	39	31	80	34	28	68	31	25	58	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	79	34	28	65	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	88	88	66	88	78	54	88	65	45	74	55	38	60	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	60	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	80	54	33	75	46	30	63	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	80	43	29	64	36	26	52	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	93	50	36	93	41	32	82	35	28	69	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	88	69	48	78	57	40	62	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
20	B	0-7	Interior	59	59	59	59	59	59	59	59	55	59	59	46	59	59	40	59	57	35	59	50	32	59	39	27	50	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	59	59	40	59	55	34	59	47	30	59	41	27	56	35	25	49	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	59	59	59	59	59	56	59	59	46	59	59	38	59	55	34	59	47	31	59	40	28	52	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	59	55	34	59	45	30	59	37	27	54	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	72	72	72	72	72	72	72	72	67	72	72	54	72	65	45	72	54	38	72	46	34	72	35	28	63	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	72	65	45	72	52	37	72	42	32	72	35	29	72	32	26	62	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	70	70	70	70	70	70	70	70	70	70	70	70	70	70	60	70	70	51	70	64	44	63	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	70	70	60	70	70	49	70	59	41	66	50	35	54	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	59	59	43	59	59	36	59	51	32	59	44	29	59	38	26	53	34	24	47	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	59	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	59	59	35	59	49	32	59	41	28	59	35	25	50	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	50	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	72	72	50	72	57	40	72	47	34	72	39	31	72	34	28	68	31	25	58	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	72	34	28	65	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	70	70	66	70	70	54	70	65	45	70	55	38	60	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	60	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	59	54	33	59	46	30	59	39	27	54	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	59	43	29	59	36	26	52	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	75	50	36	75	41	32	75	35	28	69	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	76	69	48	76	57	40	62	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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	46	47	47	40	47	47	35	47	47	32	47	39	27	47	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	47	47	40	47	47	34	47	47	30	47	41	27	47	35	25	47	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	47	47	47	47	47	47	47	47	46	47	47	38	47	47	34	47	47	31	47	40	28	47	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	47	47	34	47	45	30	47	37	27	47	33	24	45	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	55	55	55	55	55	55	55	55	55	55	55	54	55	55	45	55	54	38	55	46	34	55	35	28	55	30	24	50	25	21	40	22	18	34	20	16	30	17	14
			Exposed	55	55	45	55	52	37	55	42	32	55	35	29	55	32	26	55	29	24	53	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		27-45	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	44	51	48	34	47	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	51	51	51	51	51	49	51	51	41	51	50	35	51	43	32	45	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	47	47	43	47	47	36	47	47	32	47	44	29	47	38	26	47	34	24	47	31	22	36	26	18	31	22	16	27	19	14	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	47	47	35	47	47	32	47	41	28	47	35	25	47	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	47	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	55	55	50	55	55	40	55	47	34	55	39	31	55	34	28	55	31	25	55	28	23	44	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	55	34	28	55	30	25	54	27	22	46	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	51	51	51	51	51	51	51	51	45	51	51	38	51	47	34	50	40	31	43	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	51	46	33	48	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	47	47	33	47	46	30	47	39	27	47	34	24	47	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	47	43	29	47	36	26	47	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	60	50	36	60	41	32	60	35	28	60	31	26	58	28	23	50	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	58	28	23	48	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	56	56	48	56	56	40	56	48	34	51	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
40	B	0-7	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	40	43	43	35	43	43	32	43	39	27	43	33	23	40	28	20	34	24	17	30	21	15	26	19	13
			Exposed	43	43	40	43	43	34	43	43	30	43	41	27	43	35	25	43	32	23	43	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	44	44	44	44	44	44	44	44	44	44	44	38	44	44	34	44	44	31	44	40	28	44	32	24	39	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	44	44	34	44	44	30	44	37	27	44	33	24	44	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		20-27	Interior	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	38	43	43	34	43	35	28	43	30	24	43	25	21	40	22	18	34	20	16	30	17	14
			Exposed	43	43	43	43	43	37	43	42	32	43	35	29	43	32	26	43	29	24	43	27	22	41	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	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	34	40	38	29	36	32	25	31	28	22	27	25	19	24	22	17
			Exposed	40	40	40	40	40	40	40	40	40	40	40	35	40	40	32	40	37	29	39	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	43	43	43	43	43	36	43	43	32	43	43	29	43	38	26	43	34	24	43	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	43	38	26	43	33	23	43	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	44	44	35	44	44	32	44	41	28	44	35	25	44	31	23	42	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	44	31	23	41	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	43	43	43	43	43	40	43	43	34	43	39	31	43	34	28	43	31	25	43	28	23	43	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	43	34	28	43	30	25	43	27	22	43	24	20	39	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	40	40	40	40	40	40	40	40	40	40	40	38	40	40	34	40	40	31	40	35	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	40	40	33	40	39	30	40	34	27	34	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	46	46	33	46	46	30	46	39	27	46	34	24	46	31	22	41	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	46	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	47	43	29	47	36	26	47	32	23	43	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	47	47	36	47	41	32	47	35	28	47	31	26	47	28	23	47	26	21	43	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	47	28	23	47	25	21	40	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	44	44	44	44	44	40	44	44	34	44	41	31	43	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	42	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6
50	B	0-7	Interior	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	32	37	37	27	37	33	23	37	28	20	34	24	17	30	21	15	26	19	13
			Exposed	37	37	37	37	37	34	37	37	30	37	37	27	37	35	25	37	32	23	37	29	21	34	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	38	38	38	38	38	38	38	38	38	38	38	38	38	38	34	38	38	31	38	38	28	38	32	24	38	27	20	33	24	17	28	21	15	25	18	13	22	16	12
			Exposed	38	38	34	38	38	30	38	37	27	38	33	24	38	30	22	38	27	20	34	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	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	28	35	30	24	35	25	21	35	22	18	34	20	16	30	17	14
			Exposed	35	35	35	35	35	35	35	35	32	35	35	29	35	32	26	35	29	24	35	27	22	35	22	18	33	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		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	29	33	32	25	31	28	22	27	25	19	24	22	17
			Exposed	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	29	33	33	26	32	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	37	37	37	37	37	36	37	37	32	37	37	29	37	37	26	37	34	24	37	31	22	36	26	18	31	22	16	27	19	14	23	17	12	20	15	10	18	13	9
			Exposed	37	37	26	37	33	23	37	30	21	37	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	38	38	35	38	38	32	38	38	28	38	35	25	38	31	23	38	29	21	36	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	38	31	23	38	28	20	34	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	Interior	35	35	35	35	35	35	35	35	34	35	35	31	35	34	28	35	31	25	35	28	23	35	24	20	35	20	17	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	35	34	28	35	30	25	35	27	22	35	24	20	35	22	18	35	20	17	32	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	Interior	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	33	33	28	33	30	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	33	33	33	33	33	30	33	33	27	33	31	24	31	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	40	40	33	40	40	30	40	39	27	40	34	24	40	31	22	40	28	20	36	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	40	31	22	39	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	41	41	29	41	36	26	41	32	23	41	29	21	36	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	36	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	39	39	36	39	39	32	39	35	28	39	31	26	39	28	23	39	26	21	39	23	19	34	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	39	28	23	39	25	21	39	22	18	35	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	36	36	36	36	36	36	36	36	34	36	36	31	36	35	28	36	32	25	33	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	36	35	28	35	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	27	31	31	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	23	31	29	21	31	25	17	29	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	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	27	20	32	24	17	28	21	15	25	18	13	22	16	12
			Exposed	32	32	32	32	32	30	32	32	27	32	32	24	32	30	22	32	27	20	32	25	18	29	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	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	28	30	30	24	30	25	21	30	22	18	30	20	16	30	17	14
			Exposed	30	30	30	30	30	30	30	30	30	30	30	29	30	30	26	30	29	24	30	27	22	30	22	18	30	19	16	29	17	14	25	14	12	22	13	10	19	11	9
		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	25	28	28	22	27	25	19	24	22	17
			Exposed	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	26	28	28	22	27	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	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	14	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	32	32	32	32	32	32	32	32	28	32	32	25	32	31	23	32	29	21	32	26	19	30	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	32	31	23	32	28	20	32	25	18	31	22	17	28	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		20-27	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	30	18	14	26	15	13	23	13	11	20	12	10
			Exposed	30	30	28	30	30	25	30	27	22	30	24	20	30	22	18	30	20	17	30	18	15	27	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		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	24	28	25	20	25	22	17	21	19	15	19	17	13	17	15	12
			Exposed	28	28	28	28	28	28	28	28	27	28	28	24	28	28	22	28	25	20	26	23	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	35	35	33	35	35	30	35	35	27	35	34	24	35	31	22	35	28	20	35	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	35	31	22	35	27	19	34	25	17	31	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	35	35	29	35	35	26	35	32	23	35	29	21	35	26	19	33	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	35	26	19	32	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	33	33	33	33	33	32	33	33	28	33	31	26	33	28	23	33	26	21	33	23	19	33	20	16	29	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	33	28	23	33	25	21	33	22	18	33	20	17	32	18	15	29	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	25	31	29	23	28	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	31	31	28	31	31	25	31	28	22	28	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	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	23	27	27	20	27	24	17	27	21	15	26	19	13
			Exposed	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	25	17	27	21	15	25	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	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	24	17	27	21	15	25	18	13	22	16	12	22	16	12
			Exposed	27	27	27	27	27	27	27	27	27	27	27	24	27	27	22	27	27	20	27	25	18	27	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	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	24	26	25	21	26	22	18	26	20	16	26	17	14	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	26	17	14	25	14	12	22	13	10	19	11	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	24	24	24	24	24	22	24	24	19	24	22	17
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	19	23	21	16	20	18	14	18	16	13	16	14	11
	C	0-7	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26	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	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	27	21	27	26	19	27	22	16	26	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	27	27	23	27	27	20	27	25	18	27	22	17	27	20	15	25	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		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	24	20	26	20	17	26	18	14	26	15	13	23	13	11	20	12	10
			Exposed	26	26	26	26	26	25	26	26	22	26	24	20	26	22	18	26	20	17	26	18	15	26	15	13	23	13	11	20	11	9	17	10	8	15	9	7	13	8	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	24	24	20	24	22	17	21	19	15	19	17	13	17	15	12			
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	24	24	24	24	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	30	30	30	30	30	30	30	30	27	30	30	24	30	30	22	30	28	20	30	26	18	30	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	30	30	22	30	27	19	30	25	17	30	22	16	28	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	30	30	29	30	30	26	30	30	23	30	29	21	30	26	19	30	24	17	30	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	30	26	19	30	23	17	29	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	Interior	28	28	28	28	28	28	28	28	28	28	28	26	28	28	23	28	26	21	28	23	19	28	20	16	28	17	14	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	28	28	23	28	25	21	28	22	18	28	20	17	28	18	15	28	17	14	26	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	23	27	25	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	27	27	27	27	27	25	27	27	22	27	25	20	26	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	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	23	24	24	20	24	24	17	24	21	15	24	19	13
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	21	24	24	17	24	21	15	24	18	13	22	16	11	19	14	10	17	12	9
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	17	24	21	15	24	18	13	22	16	12	22	16	12
			Exposed	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	24	24	20	24	24	18	24	21	15	24	18	13	21	15	11	18	13	10	16	12	9	14	10	8
		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	21	23	22	18	23	20	16	23	17	14	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	17	14	23	14	12	22	13	10	19	11	9
		27-45	Interior	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	22	17
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	19	22	21	16	20	18	14	18	16	13	16	14	11			
	C	0-7	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	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	12	9	15	11	8	13	10	7	12	8	6
		7-20	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	22	19	24	24	21	24	22	16	24	19	14	22	16	12	19	14	10	17	12	9	15	11	8
			Exposed	24	24	23	24	24	20	24	24	18	24	22	17	24	20	15	24	18	14	23	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	5
		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	20	17	23	18	14	23	15	13	23	13	11	20	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	23	13	11	20	11	9	17	10	8	15	9	7	13	8	6
		27-45	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	21	19	15	19	17	13	17	15	12			
			Exposed	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	20	22	22	18	22	19	15	19	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	26	26	26	26	26	26	26	26	26	26	26	24	26	26	22	26	26	20	26	26	18	26	22	15	26	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	26	26	22	26	26	19	26	25	17	26	22	16	26	20	14	25	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	27	27	27	27	27	26	27	27	23	27	27	21	27	26	19	27	24	17	27	22	16	25	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	27	26	19	27	23	17	27	21	15	26	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	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	25	15	12	22	13	10	19	11	9	17	10	8
			Exposed	25	25	23	25	25	21	25	22	18	25	20	17	25	18	15	25	17	14	25	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	5
		27-45	Interior	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	24	24	20	24	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	24	24	24	24	24	24	24	24	22	24	24	20	24	23	18	23	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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
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	20	21	21	17	21	21	15	21	19	13
			Exposed	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	13	21	16	11	19	14	10	17	12	9
		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	20	21	21	17	21	21	15	21	18	13	21	16	12
			Exposed	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	15	21	18	13	21	15	11	18	13	10	16	12	9	14	10	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	20	20	20	20	20	20	18	20	20	16	20	17	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	19	16	20	17	14	20	14	12	20	13	10	19	11	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	19	19	19	19	19	19	19	19	17
			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	19	18	14	18	16	13	16	14	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	18	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	12	9	15	11	8	13	10	7	12	8	6
		7-20	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	19	14	21	16	12	19	14	10	17	12	9	15	11	8
			Exposed	21	21	21	21	21	20	21	21	18	21	21	17	21	20	15	21	18	14	21	17	12	20	14	10	17	12	9	14	11	8	13	9	7	11	8	6	10	7	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	18	14	20	15	13	20	13	11	20	12	10	17	12	9
			Exposed	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20	20	17	20	18	15	20	15	13	20	13	11	20	11	9	17	10	8	15	9	7	13	8	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	19	19	17	19	19	15	19	17	13	17	15	12	15	12	10
			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	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	23	23	20	23	23	18	23	22	15	23	18	13	22	16	11	19	14	10	17	12	9	15	11	8
			Exposed	23	23	22	23	23	19	23	23	17	23	22	16	23	20	14	23	18	13	23	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	24	24	24	24	24	24	24	24	23	24	24	21	24	24	19	24	24	17	24	22	16	24	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	24	24	19	24	23	17	24	21	15	24	19	14	23	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	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	22	13	10	19	11	9	17	10	8
			Exposed	22	22	22	22	22	21	22	22	18	22	20	17	22	18	15	22	17	14	22	15	13	22	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	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	20	21	21	17	20	18	14	18	16	13	16	14	11	14	12	10
			Exposed	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	17	21	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	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	17	19	19	15	19	19	13	19	19	13
			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	15	19	18	13	19	16	11	19	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	19	19	19	17	19	19	15	19	18	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	15	11	18	13	10	16	12	9	14	10	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	16	18	18	16	18	18	16	18	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	16	18	17	14	18	14	12	18	13	10	18	11	9	17	12	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	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	17	17	17	14	17	16	13	16	14	11	14	12	10
	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	18	19	19	16	19	19	14	19	17	12	19	15	10	18	13	9
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	19	19	15	19	19	14	19	17	12	19	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	19	14	19	16	12	19	14	10	17	12	9	15	11	8
			Exposed	19	19	19	19	19	19	19	19	18	19	19	17	19	19	15	19	18	14	19	17	12	19	14	10	17	12	9	14	11	8	13	9	7	11	8	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	15	13	18	13	11	18	12	10	17	12	9
			Exposed	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	18	18	15	18	15	13	18	13	11	18	11	9	17	10	8	15	9	7	13	8	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	15	17	17	13	17	17	12	17	15	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	17	13	16	14	11	14	13	10	12	11	9	11	10	8
	D	0-7	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	21	21	18	21	21	15	21	18	13	21	16	11	19	14	10	17	12	9	15	11	8	13	10	8
			Exposed	21	21	21	21	21	19	21	21	17	21	21	16	21	20	14	21	18	13	21	17	12	19	14	10	17	12	8	14	10	7	12	9	6	11	8	6	10	7	5
		7-20	Interior	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	21	21	17	21	21	16	21	18	13	21	16	11	18	13	10	16	12	9	14	10	8	13	9	7
			Exposed	21	21	19	21	21	17	21	21	15	21	19	14	21	17	12	21	15	11	19	14	10	16	12	9	14	10	7	12	9	6	10	8	6	9	7	5	8	6	4
		20-27	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	20	17	14	20	15	12	20	13	10	19	11	9	17	10	8
			Exposed	20	20	20	20	20	20	20	20	18	20	20	17	20	18	15	20	17	14	20	15	13	20	13	11	19	11	9	16	9	8	14	8	7	12	7	6	11	6	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	17	19	18	14	18	16	13	16	14	11	14	12	10
			Exposed	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	17	19	19	15	18	16	13	15	14	11	13	12	9	12	10	8	10	9	7	9	8	6

UNIRAC

ASCE 7-22	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	104	185	185	75	185	153	62	185	90	53	157	64	45	95	55	39	68	48	34	58	42	30	52	38	27
			Exposed	185	185	102	185	185	70	185	130	60	185	96	54	185	75	49	148	63	44	108	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	183	183	183	183	183	183	183	183	183	183	183	183	183	183	70	183	183	60	183	183	55	183	63	46	183	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	183	183	68	183	183	59	183	183	53	183	64	47	183	58	43	183	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	73	181	88	56	181	58	48	181	50	41	110	44	36	68	39	32	59	34	28
			Exposed	181	181	181	181	181	181	181	181	64	181	181	57	181	63	52	181	57	47	181	52	43	116	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		27-45	Interior	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	74	173	96	57	173	63	50	61	55	43	54	48	38	48	43	34
			Exposed	173	173	173	173	173	173	173	173	173	173	173	82	173	173	62	173	91	57	173	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	185	185	136	185	185	82	185	162	63	185	112	57	185	86	52	185	69	47	130	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	185	85	51	173	65	46	112	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	183	183	183	183	183	62	183	183	56	183	82	50	183	62	45	183	56	41	183	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	183	61	45	183	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	181	181	181	181	181	181	181	181	81	181	181	61	181	74	55	181	61	50	181	55	46	181	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	181	72	55	181	59	49	181	53	44	181	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	173	173	173	173	173	173	173	173	173	173	173	173	173	173	68	173	121	60	173	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	173	173	67	173	104	59	173	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	185	185	67	185	122	59	185	89	53	185	70	47	129	61	43	96	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	127	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	183	183	58	183	183	52	183	63	46	183	57	42	183	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	183	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	181	181	181	181	181	62	181	85	56	181	61	50	181	55	46	181	50	42	181	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	181	55	46	181	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	173	173	173	173	173	173	173	173	73	173	128	60	173	79	55	173	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	173	78	55	173	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
10	B	0-7	Interior	156	156	156	156	156	156	156	156	156	156	156	156	156	156	104	156	156	75	156	153	62	156	90	53	156	64	45	95	55	39	68	48	34	58	42	30	52	38	27
			Exposed	156	156	102	156	156	70	156	130	60	156	96	54	156	75	49	148	63	44	108	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	157	157	157	157	157	157	157	157	157	157	157	157	157	157	70	157	157	60	157	157	55	157	63	46	157	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	157	157	68	157	157	59	157	157	53	157	64	47	157	58	43	157	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	73	179	88	56	179	58	48	179	50	41	110	44	36	68	39	32	59	34	28
			Exposed	179	179	179	179	179	179	179	179	64	179	179	57	179	63	52	179	57	47	179	52	43	116	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		27-45	Interior	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	74	173	96	57	173	63	50	61	55	43	54	48	38	48	43	34
			Exposed	173	173	173	173	173	173	173	173	173	173	173	82	173	173	62	173	91	57	173	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	156	156	136	156	156	82	156	156	63	156	112	57	156	86	52	156	69	47	130	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	156	85	51	156	65	46	112	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	157	157	157	157	157	62	157	157	56	157	82	50	157	62	45	157	56	41	157	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	157	61	45	157	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	179	179	179	179	179	179	179	179	81	179	179	61	179	74	55	179	61	50	179	55	46	179	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	179	72	55	179	59	49	179	53	44	179	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	173	173	173	173	173	173	173	173	173	173	173	173	173	173	68	173	121	60	173	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	173	173	67	173	104	59	173	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	156	156	67	156	122	59	156	89	53	156	70	47	129	61	43	96	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	127	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	157	157	58	157	157	52	157	63	46	157	57	42	157	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	157	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	181	181	181	181	181	62	181	85	56	181	61	50	181	55	46	181	50	42	181	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	181	55	46	181	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	173	173	173	173	173	173	173	173	73	173	128	60	173	79	55	173	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	173	78	55	173	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
20	B	0-7	Interior	115	115	115	115	115	115	115	115	115	115	115	115	115	115	104	115	115	75	115	115	62	115	90	53	115	64	45	95	55	39	68	48	34	58	42	30	52	38	27
			Exposed	115	115	102	115	115	70	115	115	60	115	96	54	115	75	49	115	63	44	108	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	116	116	116	116	116	116	116	116	116	116	116	116	116	116	70	116	116	60	116	116	55	116	63	46	116	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	116	116	68	116	116	59	116	116	53	116	64	47	116	58	43	116	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	73	141	88	56	141	58	48	141	50	41	110	44	36	68	39	32	59	34	28
			Exposed	141	141	141	141	141	141	141	141	64	141	141	57	141	63	52	141	57	47	141	52	43	116	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	74	138	96	57	138	63	50	61	55	43	54	48	38	48	43	34
			Exposed	138	138	138	138	138	138	138	138	138	138	138	82	138	138	62	138	91	57	138	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	115	115	115	115	115	82	115	115	63	115	112	57	115	86	52	115	69	47	115	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	115	85	51	115	65	46	112	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	116	116	116	116	116	62	116	116	56	116	82	50	116	62	45	116	56	41	116	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	116	61	45	116	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	141	141	141	141	141	141	141	141	81	141	141	61	141	74	55	141	61	50	141	55	46	141	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	141	72	55	141	59	49	141	53	44	141	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	138	138	138	138	138	138	138	138	138	138	138	138	138	138	68	138	121	60	138	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	138	138	67	138	104	59	138	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	115	115	67	115	115	59	115	89	53	115	70	47	115	61	43	96	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	115	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	116	116	58	116	116	52	116	63	46	116	57	42	116	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	116	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	147	147	147	147	147	62	147	85	56	147	61	50	147	55	46	147	50	42	147	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	147	55	46	147	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	149	149	149	149	149	149	149	149	73	149	128	60	149	79	55	149	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	149	78	55	149	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13

UNIRAC

ASCE 7-22	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	75	91	91	62	91	90	53	91	64	45	91	55	39	68	48	34	58	42	30	52	38	27
			Exposed	91	91	91	91	91	70	91	91	60	91	91	54	91	75	49	91	63	44	91	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	70	92	92	60	92	92	55	92	63	46	92	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	92	92	68	92	92	59	92	92	53	92	64	47	92	58	43	92	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	73	108	88	56	108	58	48	108	50	41	108	44	36	68	39	32	59	34	28
			Exposed	108	108	108	108	108	108	108	108	64	108	108	57	108	63	52	108	57	47	108	52	43	108	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		27-45	Interior	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	74	101	96	57	101	63	50	61	55	43	54	48	38	48	43	34
			Exposed	101	101	101	101	101	101	101	101	101	101	101	82	101	101	62	101	91	57	101	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	91	91	91	91	91	82	91	91	63	91	91	57	91	86	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	85	51	91	65	46	91	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	92	92	92	92	92	62	92	92	56	92	82	50	92	62	45	92	56	41	92	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	92	61	45	92	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	108	108	108	108	108	108	108	108	81	108	108	61	108	74	55	108	61	50	108	55	46	108	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	108	72	55	108	59	49	108	53	44	108	48	40	105	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	101	101	101	101	101	101	101	101	101	101	101	101	101	101	68	101	101	60	101	80	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	101	101	67	101	101	59	101	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	91	91	67	91	91	59	91	89	53	91	70	47	91	61	43	91	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	91	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	92	92	58	92	92	52	92	63	46	92	57	42	92	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	92	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	118	118	118	118	118	62	118	85	56	118	61	50	118	55	46	118	50	42	118	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	118	55	46	118	49	41	114	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	110	110	110	110	110	110	110	110	73	110	110	60	110	79	55	110	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	110	78	55	110	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
40	B	0-7	Interior	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	75	85	85	62	85	85	53	85	64	45	85	55	39	68	48	34	58	42	30	52	38	27
			Exposed	85	85	85	85	85	70	85	85	60	85	85	54	85	75	49	85	63	44	85	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	86	86	86	86	86	86	86	86	86	86	86	86	86	86	70	86	86	60	86	86	55	86	63	46	86	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	86	86	68	86	86	59	86	86	53	86	64	47	86	58	43	86	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	15
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	73	84	84	56	84	58	48	84	50	41	84	44	36	68	39	32	59	34	28
			Exposed	84	84	84	84	84	84	84	84	64	84	84	57	84	63	52	84	57	47	84	52	43	84	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	79	57	79	63	50	61	55	43	54	48	38	48	43	34
			Exposed	79	79	79	79	79	79	79	79	79	79	79	79	79	79	62	79	79	57	79	66	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	85	85	85	85	85	82	85	85	63	85	85	57	85	85	52	85	69	47	85	61	43	79	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	85	85	51	85	65	46	85	58	41	84	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	86	86	86	86	86	62	86	86	56	86	82	50	86	62	45	86	56	41	86	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	86	61	45	86	55	40	80	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	84	84	84	84	84	84	84	84	81	84	84	61	84	74	55	84	61	50	84	55	46	84	47	39	77	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	84	72	55	84	59	49	84	53	44	84	48	40	84	43	36	74	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	79	79	79	79	79	79	79	79	79	79	79	79	79	79	68	79	79	60	79	79	55	67	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	79	79	67	79	79	59	79	69	53	79	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	91	91	67	91	91	59	91	89	53	91	70	47	91	61	43	91	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	91	61	43	90	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	92	92	58	92	92	52	92	63	46	92	57	42	92	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	92	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	92	92	92	92	92	62	92	85	56	92	61	50	92	55	46	92	50	42	92	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	92	55	46	92	49	41	92	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	87	87	87	87	87	87	87	87	73	87	87	60	87	79	55	87	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	87	78	55	87	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
50	B	0-7	Interior	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	62	73	73	53	73	64	45	73	55	39	68	48	34	58	42	30	52	38	27
			Exposed	73	73	73	73	73	70	73	73	60	73	73	54	73	73	49	73	63	44	73	58	41	70	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	74	74	74	74	74	74	74	74	74	74	74	74	74	74	70	74	74	60	74	74	55	74	63	46	74	54	40	64	46	34	56	41	30	49	36	26	43	32	23
			Exposed	74	74	68	74	74	59	74	74	53	74	64	47	74	58	43	74	53	39	74	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	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	56	69	58	48	69	50	41	69	44	36	68	39	32	59	34	28
			Exposed	69	69	69	69	69	69	69	69	64	69	69	57	69	63	52	69	57	47	69	52	43	69	44	37	65	38	31	56	33	27	49	29	24	43	25	21	38	22	19
		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	57	65	63	50	61	55	43	54	48	38	48	43	34
			Exposed	65	65	65	65	65	65	65	65	65	65	65	65	65	65	62	65	65	57	65	65	52	62	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	73	73	73	73	73	73	73	73	63	73	73	57	73	73	52	73	69	47	73	61	43	73	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	73	73	51	73	65	46	73	58	41	73	53	37	67	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	74	74	74	74	74	62	74	74	56	74	74	50	74	62	45	74	56	41	74	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	74	61	45	74	55	40	74	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	69	69	69	69	69	69	69	69	69	69	69	61	69	69	55	69	61	50	69	55	46	69	47	39	69	40	33	59	35	29	52	30	25	46	27	22	40	24	20
			Exposed	69	69	55	69	59	49	69	53	44	69	48	40	69	43	36	69	40	33	62	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		27-45	Interior	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	60	65	65	55	65	59	46	56	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	65	65	65	65	65	59	65	65	53	65	60	47	61	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	79	79	67	79	79	59	79	79	53	79	70	47	79	61	43	79	55	39	77	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	79	61	43	79	54	38	69	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	80	80	58	80	80	52	80	63	46	80	57	42	80	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	80	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	76	76	76	76	76	62	76	76	56	76	61	50	76	55	46	76	50	42	76	46	38	70	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	76	55	46	76	49	41	76	44	36	75	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	72	72	72	72	72	72	72	72	72	72	72	60	72	72	55	72	63	50	65	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	72	72	55	72	62	49	62	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13

UNIRAC

ASCE 7-22	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	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	53	61	61	45	61	55	39	61	48	34	58	42	30	52	38	27
			Exposed	61	61	61	61	61	61	61	61	60	61	61	54	61	61	49	61	61	44	61	58	41	61	49	34	57	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	60	62	62	55	62	62	46	62	54	40	62	46	34	56	41	30	49	36	26	43	32	23
			Exposed	62	62	62	62	62	59	62	62	53	62	62	47	62	58	43	62	53	39	62	48	36	56	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	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	56	58	58	48	58	50	41	58	44	36	58	39	32	58	34	28
			Exposed	58	58	58	58	58	58	58	58	58	58	58	57	58	58	52	58	57	47	58	52	43	58	44	37	58	38	31	56	33	27	49	29	24	43	25	21	38	22	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	50	55	55	43	54	48	38	48	43	34
			Exposed	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	55	55	44	53	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	61	61	61	61	61	61	61	61	61	61	61	57	61	61	52	61	61	47	61	61	43	61	51	36	61	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	61	61	51	61	61	46	61	58	41	61	53	37	61	48	34	60	43	31	55	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	62	62	62	62	62	62	62	62	56	62	62	50	62	62	45	62	56	41	62	51	38	60	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	62	61	45	62	55	40	62	49	36	61	44	33	55	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	58	58	58	58	58	58	58	58	58	58	58	58	58	58	55	58	58	50	58	55	46	58	47	39	58	40	33	58	35	29	52	30	25	46	27	22	40	24	20
			Exposed	58	58	55	58	58	49	58	53	44	58	48	40	58	43	36	58	40	33	58	36	30	52	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	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	46	55	50	40	49	43	34	42	38	30	37	33	27	33	30	24
			Exposed	55	55	55	55	55	55	55	55	53	55	55	47	55	54	43	55	50	39	51	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	68	68	67	68	68	59	68	68	53	68	68	47	68	61	43	68	55	39	68	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	68	61	43	68	54	38	68	48	34	60	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	69	69	58	69	69	52	69	63	46	69	57	42	69	51	38	64	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	69	51	38	63	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	64	64	64	64	64	62	64	64	56	64	61	50	64	55	46	64	50	42	64	46	38	64	39	32	57	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	64	55	46	64	49	41	64	44	36	64	40	33	62	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	61	61	61	61	61	61	61	61	61	61	61	60	61	61	55	61	61	50	61	58	46	55	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	61	61	55	61	61	49	61	55	44	56	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
70	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	48	34	53	42	30	52	38	27
			Exposed	53	53	53	53	53	53	53	53	53	53	53	53	53	53	49	53	53	44	53	53	41	53	49	34	53	42	29	49	36	25	43	31	22	38	28	20	34	25	17
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	46	54	54	40	54	46	34	54	41	30	49	36	26	43	32	23
			Exposed	54	54	54	54	54	54	54	54	53	54	54	47	54	54	43	54	53	39	54	48	36	54	41	30	48	35	26	42	30	22	36	26	20	32	23	17	28	21	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	51	51	51	48	51	50	41	51	44	36	51	39	32	51	34	28
			Exposed	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	47	51	51	43	51	44	37	51	38	31	51	33	27	49	29	24	43	25	21	38	22	19
		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	48	48	48	43	48	48	38	48	43	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	44	48	47	38	46	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	53	53	47	53	53	43	53	51	36	53	44	31	52	38	27	46	33	23	40	29	21	36	26	18
			Exposed	53	53	51	53	53	46	53	53	41	53	53	37	53	48	34	53	43	31	53	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	54	54	54	54	54	54	54	54	54	54	54	50	54	54	45	54	54	41	54	51	38	54	43	32	51	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	54	54	45	54	54	40	54	49	36	54	44	33	54	40	30	50	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		20-27	Interior	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	50	51	51	46	51	47	39	51	40	33	51	35	29	51	30	25	46	27	22	40	24	20
			Exposed	51	51	51	51	51	49	51	51	44	51	48	40	51	43	36	51	40	33	51	36	30	51	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		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	46	48	48	40	48	43	34	42	38	30	37	33	27	33	30	24
			Exposed	48	48	48	48	48	48	48	48	48	48	48	47	48	48	43	48	48	39	48	45	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	59	59	59	59	59	59	59	59	53	59	59	47	59	59	43	59	55	39	59	51	36	59	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	59	59	43	59	54	38	59	48	34	59	44	31	55	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	60	60	58	60	60	52	60	60	46	60	57	42	60	51	38	60	47	34	59	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	60	51	38	60	46	34	56	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	56	56	56	56	56	56	56	56	56	56	56	50	56	55	46	56	50	42	56	46	38	56	39	32	56	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	56	55	46	56	49	41	56	44	36	56	40	33	56	36	30	56	33	27	52	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	50	53	53	46	53	49	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	53	53	53	53	53	49	53	53	44	53	50	40	51	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
80	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	45	47	47	39	47	47	34	47	42	30	47	38	27
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	44	47	47	41	47	47	34	47	42	29	47	36	25	43	31	22	38	28	20	34	25	17
		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	46	47	47	40	47	46	34	47	41	30	47	36	26	43	32	23
			Exposed	47	47	47	47	47	47	47	47	47	47	47	47	47	47	43	47	47	39	47	47	36	47	41	30	47	35	26	42	30	22	36	26	20	32	23	17	28	21	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	45	45	45	45	45	45	41	45	44	36	45	39	32	45	34	28
			Exposed	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	43	45	44	37	45	38	31	45	33	27	45	29	24	43	25	21	38	22	19
		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	43	43	43	38	43	43	34
			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	38	43	41	33	40	36	28	35	32	25	31	28	22
	C	0-7	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	43	47	47	36	47	44	31	47	38	27	46	33	23	40	29	21	36	26	18
			Exposed	47	47	47	47	47	46	47	47	41	47	47	37	47	47	34	47	43	31	47	40	28	46	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	45	47	47	41	47	47	38	47	43	32	47	37	27	44	32	24	38	28	21	34	25	18	30	22	16
			Exposed	47	47	45	47	47	40	47	47	36	47	44	33	47	40	30	47	37	27	46	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	11
		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	39	45	40	33	45	35	29	45	30	25	45	27	22	40	24	20
			Exposed	45	45	45	45	45	45	45	45	44	45	45	40	45	43	36	45	40	33	45	36	30	45	31	25	45	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		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	40	43	43	34	42	38	30	37	33	27	33	30	24
			Exposed	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	39	43	43	36	43	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	52	52	52	52	52	52	52	52	52	52	52	47	52	52	43	52	52	39	52	51	36	52	43	30	50	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	52	52	43	52	52	38	52	48	34	52	44	31	52	40	28	50	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	52	52	52	52	52	52	52	52	46	52	52	42	52	51	38	52	47	34	52	43	32	49	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	52	51	38	52	46	34	52	41	30	51	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	49	49	49	49	49	49	49	49	49	49	49	49	49	49	46	49	49	42	49	46	38	49	39	32	49	33	28	49	29	24	43	25	21	38	22	18	34	20	16
			Exposed	49	49	46	49	49	41	49	44	36	49	40	33	49	36	30	49	33	27	49	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	11
		27-45	Interior	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	46	47	47	39	47	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	47	47	47	47	47	47	47	47	44	47	47	40	47	45	36	46	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13

UNIRAC

ASCE 7-22	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	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	30	42	38	27
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	34	42	42	29	42	36	25	42	31	22	38	28	20	34	25	17
		7-20	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	40	42	42	34	42	41	30	42	36	26	42	32	23
			Exposed	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	36	42	41	30	42	35	26	42	30	22	36	26	20	32	23	17	28	21	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	40	40	40	36	40	39	32	40	34	28
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	40	38	31	40	33	27	40	29	24	40	25	21	38	22	19
		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	38	38	38	34
			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	33	38	36	28	35	32	25	31	28	22
	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	36	42	42	31	42	38	27	42	33	23	40	29	21	36	26	18
			Exposed	42	42	42	42	42	42	42	42	41	42	42	37	42	42	34	42	42	31	42	40	28	42	34	24	39	29	20	34	25	18	30	22	15	26	19	14	23	17	12
		7-20	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	42	42	38	42	42	32	42	37	27	42	32	24	38	28	21	34	25	18	30	22	16
			Exposed	42	42	42	42	42	40	42	42	36	42	42	33	42	40	30	42	37	27	42	33	25	39	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	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	39	40	40	33	40	35	29	40	30	25	40	27	22	40	24	20
			Exposed	40	40	40	40	40	40	40	40	40	40	40	40	40	40	36	40	40	33	40	36	30	40	31	25	40	26	22	39	23	19	34	20	16	30	17	14	26	16	13
		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	34	38	38	30	37	33	27	33	30	24						
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	30	37	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	46	46	46	46	46	46	46	46	46	46	46	46	46	46	43	46	46	39	46	46	36	46	43	30	46	37	26	43	32	22	38	28	20	33	24	17	30	22	15
			Exposed	46	46	43	46	46	38	46	46	34	46	44	31	46	40	28	46	36	26	45	33	23	38	28	20	33	24	17	28	21	15	25	18	13	22	16	11	19	14	10
		7-20	Interior	47	47	47	47	47	47	47	47	46	47	47	42	47	47	38	47	47	34	47	43	32	47	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	47	47	38	47	46	34	47	41	30	47	37	27	46	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	38	44	39	32	44	33	28	44	29	24	43	25	21	38	22	18	34	20	16
			Exposed	44	44	44	44	44	41	44	44	36	44	40	33	44	36	30	44	33	27	44	30	25	44	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	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	39	42	42	33	40	36	29	35	32	25	31	28	22	28	25	20
			Exposed	42	42	42	42	42	42	42	42	42	42	42	40	42	42	36	42	41	33	42	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13
100	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	38	38	38	38	38	38	38	38	38	34	38	38	30	38	38	27
			Exposed	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	38	36	25	38	31	22	38	28	20	34	25	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	38	30	38	36	26	38	32	23
			Exposed	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	35	26	38	30	22	36	26	20	32	23	17	28	21	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	32	36	36	28	36	34	28
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	31	36	33	27	36	29	24	36	25	21	36	22	19
		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	33	34	34	28	34	32	25	31	28	22
	C	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	36	38	38	31	38	38	27	38	33	23	38	29	21	36	26	18
			Exposed	38	38	38	38	38	38	38	38	38	38	38	37	38	38	34	38	38	31	38	38	28	38	34	24	38	29	20	34	25	18	30	22	15	26	19	14	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	37	27	38	32	24	38	28	21	34	25	18	30	22	16
			Exposed	38	38	38	38	38	38	38	38	36	38	38	33	38	38	30	38	37	27	38	33	25	38	28	21	33	24	18	29	21	16	25	18	14	22	16	12	20	14	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	33	36	35	29	36	30	25	36	27	22	36	24	20
			Exposed	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	33	36	36	30	36	31	25	36	26	22	36	23	19	34	20	16	30	17	14	26	16	13
		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	27	33	30	24
			Exposed	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	33	26	32	28	23	28	25	20	25	22	17	22	19	15
	D	0-7	Interior	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	42	42	36	42	42	30	42	37	26	42	32	22	38	28	20	33	24	17	30	22	15
			Exposed	42	42	42	42	42	38	42	42	34	42	42	31	42	40	28	42	36	26	42	33	23	38	28	20	33	24	17	28	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	34	42	42	32	42	36	27	42	31	23	37	27	20	32	23	17	28	21	15	25	18	13
			Exposed	42	42	38	42	42	34	42	41	30	42	37	27	42	33	25	42	30	23	38	28	21	32	24	17	28	20	15	24	17	13	21	15	11	18	13	10	16	12	9
		20-27	Interior	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	39	32	40	33	28	40	29	24	40	25	21	38	22	18	34	20	16
			Exposed	40	40	40	40	40	40	40	40	36	40	40	33	40	36	30	40	33	27	40	30	25	40	25	21	37	22	18	32	19	16	28	17	14	25	15	12	22	13	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	33	38	36	29	35	32	25	31	28	22	28	25	20
			Exposed	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	38	38	33	38	38	30	36	32	25	31	27	22	27	24	19	23	21	16	20	18	15	18	16	13