

Design Criteria for Span Tables:

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

Building Assumptions

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

Wind Design Assumptions

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

Snow Design Assumptions

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

Seismic Design Assumptions

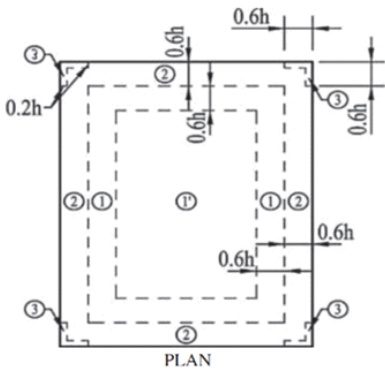
- 0.2-s Spectral Response Acceleration, $S_S \leq 3$
- $S_S = 1.25$ and 3 per criteria shown on individual span tables sheets.
- $S_1 = 0.5$
- Seismic site class D

Array Assumptions

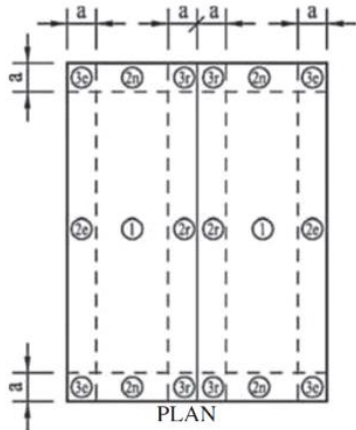
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at least twice the module height above roof surface.
- Modules are parallel to roof surface and maximum height above roof surface is 5" to 10" depending on attachment type.
- Gaps between module rows and columns is 0.25" in to 1" depending on clamp type.
- The most restrictive of all roof zone spans shall be used when any part of the module is attributed to that span.
- 'Exposed' spans as defined in ASCE 7-16 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.

Span Tables

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



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

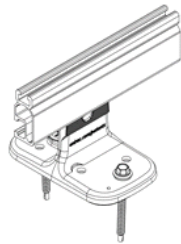


Gable Roofs $7^\circ < \theta \leq 45^\circ$

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

- **Roof Tilt 0° - 7°**
Roof Zone 1 = 1
Roof Zone 2 = 2
Roof Zone 3 = 3
- **Roof Tilt 7° - 27°**
Roof Zone 1 = 1, 2e
Roof Zone 2 = 2n, 2r, 3e
Roof Zone 3 = 3r
- **Roof Tilt 27° - 45°**
Roof Zone 1 = 1, 2e, 2r
Roof Zone 2 = 2n, 3r
Roof Zone 3 = 3e

Rails can be installed in these possible orientations.

*Flashloc DUO for Rafter	
Y+	
Y-	Alternate orientation not allowed

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

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				90			95			100			105			110			115			120			130			140			150			160			170			180		
				Roof Wind Zone																																						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3			
0	B	0-7	Interior	83	83	83	83	83	83	83	83	81	83	83	78	83	83	75	83	82	71	83	79	67	83	74	61	79	67	54	75	62	43	69	57	38	64	49	33	59	42	29
			Exposed	83	83	75	83	81	70	83	78	65	83	75	61	82	71	88	79	67	53	76	63	46	69	57	38	63	47	53	58	40	28	50	35	37	42	31	33	37	27	29
		7-20	Interior	83	83	83	83	83	83	83	79	83	82	76	83	78	71	83	75	67	82	72	63	77	64	57	71	58	45	65	48	38	61	40	33	56	35	29	49	31	31	26
			Exposed	83	78	71	83	75	66	80	70	62	77	65	58	74	61	51	70	58	44	67	52	40	61	41	34	56	35	29	47	30	38	40	26	33	35	35	29	31	31	26
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	83	84	84	80	84	81	77	84	78	73	84	72	65	81	65	59	76	59	50	72	53	40	67	43	34	62	38	29
			Exposed	84	84	80	84	80	76	84	77	71	84	73	66	83	69	62	80	65	59	78	61	54	72	53	41	66	42	33	61	36	28	56	32	23	49	28	30	42	38	26
	27-45	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	84	84	80	84	84	77	84	79	71	79	74	64	75	68	59	68	62	52	63	58	43	58	50	37	
		Exposed	84	84	83	84	84	79	84	83	76	84	80	72	82	77	68	79	74	64	76	70	60	69	63	53	62	57	42	57	47	35	46	40	30	39	35	26	35	31	37	
	C	0-7	Interior	83	83	77	83	83	73	83	80	68	83	77	64	83	77	60	81	70	57	78	66	51	72	60	41	66	52	35	60	43	30	55	37	26	46	33	35	40	29	31
			Exposed	83	74	60	80	69	56	77	64	48	73	60	42	69	57	38	65	51	35	62	45	32	56	38	27	45	32	35	38	28	30	34	37	26	30	33	23	26	29	21
		7-20	Interior	83	81	75	83	77	69	82	73	65	79	68	60	76	64	57	73	60	49	70	57	43	63	44	36	58	37	31	51	32	27	43	28	35	38	38	31	34	33	28
			Exposed	76	64	57	72	59	48	68	54	41	64	46	37	61	40	33	58	37	30	54	34	28	44	29	36	37	37	31	31	32	26	28	28	23	38	25	26	33	22	16
20-27		Interior	84	84	82	84	83	78	84	79	75	84	76	70	84	72	65	82	68	61																						

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				Roof Wind Zone																																															
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
0	B	0-7	Interior	83	83	83	83	83	83	83	83	79	83	83	76	83	83	72	83	80	68	54	77	64	47	74	61	41	66	53	35	60	42	30	72	59	40	66	52	35	61	44	31	57	38	27					
			Exposed	83	83	72	83	79	67	83	76	63	83	72	59	80	68	54	77	64	47	74	61	41	66	53	35	60	42	30	72	59	40	66	52	35	61	44	31	57	38	27									
		7-20	Interior	83	83	83	83	83	80	83	83	77	83	79	73	83	76	68	82	73	64	79	68	60	75	61	51	68	54	41	63	42	35	58	37	31	52	33	27	45	29	24									
			Exposed	83	76	68	81	71	63	78	66	59	75	62	53	71	58	45	68	53	40	64	46	37	58	37	31	51	32	27	42	28	23	37	24	20	33	21	27	29	24										
			Interior	84	84	84	84	84	84	84	84	84	84	84	81	84	82	77	84	79	74	84	76	70	83	69	62	79	62	56	74	57	44	69	46	36	64	39	31	60	35	26									
			Exposed	84	82	77	84	78	73	84	75	68	84	70	63	81	66	59	78	62	56	76	58	47	69	47	37	63	39	30	58	34	25	52	29	21	44	26	18	39	23	24									
	20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	75	82	77	68	77	71	62	72	65	56	65	60	46	60	54	39	55	45	33										
		Exposed	84	84	81	84	84	77	84	81	74	83	78	69	80	75	65	77	80	71	74	67	58	66	60	47	59	52	38	51	42	32	41	37	27	36	32	23	32	29	20										
		27-45	Interior	83	83	75	83	81	70	83	78	65	83	75	61	82	71	58	79	67	52	76	63	46	69	57	38	63	47	32	58	39	28	50	34	24	42	30	21	37	27	29									
			Exposed	82	70	58	78	66	50	75	62	43	70	58	39	66	53	35	63	46	32	59	41	29	50	35	25	41	30	21	35	26	28	31	23	24	27	30	21	24	27	19									
	7-20		Interior	83	78	71	83	75	66	80	70	62	77	65	58	74	61	51	70	57	43	67	51	39	61	40	33	55	34	28	46	30	25	40	26	22	35	23	29	31	20	25									
			Exposed	74	61	50	69	57	42	65	48	38	62	41	34	58	37	31	55	34	28	49	31	26	40	26	22	34	23	28	30	30	24	26	26	21	23	23	19	20	25	17									
20-27		Interior	84	84	80	84	80	76	84	77	71	84	73	66	83	69	6																																		

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0	B	0-7	Interior	78	78	78	78	78	78	78	78	76	78	78	76	78	78	72	78	68	67	78	77	63	78	73	60	78	66	51	73	60	40	67	53	33	61	44	29	57	36	26	48	32	23						
			Exposed	78	78	67	78	76	62	78	71	58	78	67	53	76	63	45	73	59	39	69	56	35	62	44	29	56	35	25	45	31	22	37	27	29	32	24	25	29	21	22									
		Exposed	78	73	64	78	67	59	75	62	54	70	58	45	66	52	38	62	44	33	59	38	31	52	31	26	42	27	22	35	23	29	31	20	25	27	22	24	24	20											
		Exposed	79	79	75	79	75	69	79	70	64	79	66	60	78	61	56	75	68	60	78	61	52	39	64	39	31	58	32	25	51	28	21	43	24	18	37	22	23	33	29	20									
		Exposed	79	79	78	79	79	79	74	79	78	69	79	75	64	77	70	61	74	66	57	69	62	51	62	56	39	55	44	32	42	35	27	34	31	23	30	27	19	27	24	25									
		Exposed	78	66	50	75	61	42	70	57	36	65	51	32	62	44	29	58	38	27	54	34	24	42	29	21	34	25	27	30	22	23	26	28	20	23	25	18	20	22	16										
	Exposed	69	57	42	64	48	35	60	40	31	57	34	28	51	31	26	46	28	23	41	26	21	34	22	27	29	28	24	25	25	20	22	22	18	29	19	16	26	17	14											

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0	B	0-7	Interior	83	83	83	83	83	83	83	83	79	83	83	76	83	83	72	83	80	68	83	72	83	80	68	83	72	83	67	64	82	71	58	77	64	48	72	59	40	66	52	35	61	44	31	57	38	27		
			Exposed	83	83	72	83	79	67	83	63	83	76	63	83	72	59	80	68	54	77	64	47	74	61	41	66	53	35	60	42	30	57	26	45	32	23	39	28	20	34	25	27								
		7-20	Interior	83	83	83	83	83	80	83	83	86	77	83	79	73	83	76	68	82	73	64	79	68	60	75	61	51	68	54	41	63	42	35	58	37	31	52	33	27	45	29	29	24							
			Exposed	83	76	68	81	71	63	78	66	59	75	62	53	71	58	45	68	53	40	64	46	37	58	37	31	51	32	27	42	28	23	37	24	20	33	21	27	29	29	24									
		20-27	Interior	84	84	84	84	84	84	84	84	84	84	84	84	81	84	82	77	84	79	74	84	76	70	83	69	62	79	62	56	74	57	44	69	46	36	64	39	31	60	35	26								
			Exposed	84	82	77	84	78	73	84	75	68	84	70	63	81	66	59	78	62	56	76	58	47	69	47	37	63	39	30	58	34	25	52	29	21	44	26	18	39	23	24									
	C	0-7	Interior	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	78	84	78	84	82	75	82	77	68	77	71	62	72	65	56	60	46	60	54	39	55	45	33						
			Exposed	84	84	81	84	84	77	84	81	74	83	78	69	80	75	65	77	80	61	74	67	58	66	40	47	59	52	38	51	42	32	41	37	27	36	32	23	32	29	20									
		7-20	Interior	83	83	75	83	81	70	83	78	65	83	75	61	82	71	58	79	67	52	76	63	46	69	57	38	63	47	32	58	39	28	50	34	24	42	30	21	37	27	29									
			Exposed	82	70	58	78	66	50	75	62	43	70	58	39	66	53	35	63	46	32	59	41	29	50	35	25	41	30	21	35	26	28	31	23	24	27	30	21	24	27	19									
		D	7-20	Interior	83	78	71	83	75	66	80	70	62	77	65	58	74	61	51	70	57	43	67	51	39	61	40	33	55	34	28	46	30	25	40	26	22	35	23	29	31	20	25								
				Exposed	74	61	50	69	57	42	65	48	38	62	41	34	58	37	31	55	34	28	49	31	26	40	26	22	34	23	28	30	30																		

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