

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 7-22 Sec. 29.4.4
- 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 7-22, 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

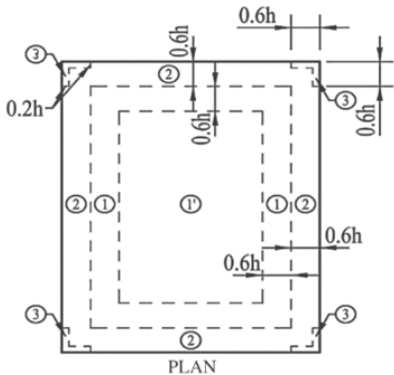
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 with $S_{ds} = 1, 2.4$ respectively per criteria shown on individual span tables sheets.
- $S_1 = 0.5$ & $S_{d1} = 0.6$
- Seismic site class D

Array Assumptions

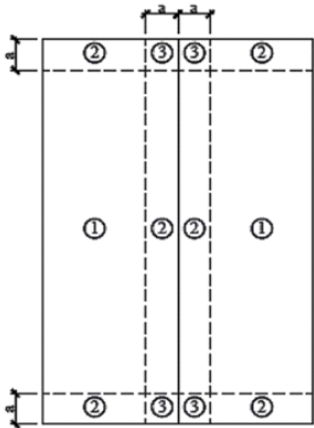
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at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

Span Tables

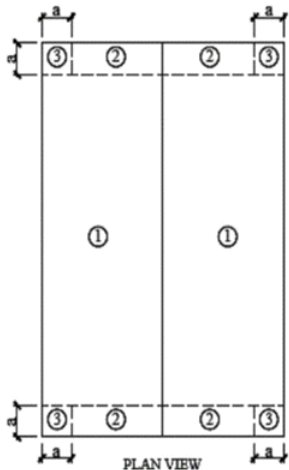
Zone should be considered as per ASCE 7-22, Fig. 30.3-2A to 30.3-2D



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



Gable Roofs $7^\circ < \theta \leq 27^\circ$



Gable Roofs $27^\circ < \theta \leq 45^\circ$

Rails can be installed in these possible orientations.

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

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

[illegible]

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

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																														
				90						95						100						105						110						
				Roof Wind Zone												Roof Wind Zone												Roof Wind Zone						
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
0	B	0-7	Interior	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	
			Exposed	98	98	91	98	98	86	98	95	82	98	90	78	98	87	75	96	83	70	92	80	66	85	75	60	80	67	56	75	62	48	
		7-20	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	
			Exposed	99	99	88	99	96	83	99	91	79	99	86	75	97	82	69	92	79	64	88	76	62	81	66	57	75	61	49	67	57	43	
		20-27	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	
			Exposed	99	99	97	99	99	91	99	95	86	99	90	82	99	86	78	99	82	75	99	79	70	92	71	62	85	63	58	80	59	51	
	C	0-7	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
			Exposed	100	100	100	100	100	98	100	93	100	98	89	100	93	85	97	89	81	93	86	78	85	80	70	79	74	63	73	66	59	65	62
		7-20	Interior	98	98	93	98	98	88	98	97	84	98	93	80	98	89	77	98	85	73	94	82	69	88	76	62	82	69	57	77	64	51	
			Exposed	98	89	77	97	84	72	93	80	66	88	77	63	85	74	60	81	69	57	78	65	53	72	60	45	65	54	57	60	47	51	56
		20-27	Interior	99	99	90	99	99	85	99	94	81	99	89	77	99	85	72	95	81	67	91	78	63	83	69	58	77	63	52	70	58	45	
			Exposed	99	84	72	94	80	66	89	76	62	84	71	59	80	65	56	77	62	51	73	60	47	64	54	58	59	46	52	55	58	45	48
	D	0-7	Interior	99	99	99	99	99	94	99	98	89	99	93	84	99	88	80	99	84	77	99	81	73	94	74	64	88	65	59	82	61	54	
			Exposed	99	99	88	99	99	83	76	99	79	90	95	75	65	91	70	62	87	65	59	84	62	56	78	57	48	71	50	59	64	43	
		7-20	Interior	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
			Exposed	100	96	87	99	91	82	94	86	78	89	82	75	85	79	69	81	76	65	77	72	62	69	64	57	62	59	50	58	44	63	53
		20-27	Interior	98	98	86	98	94	81	98	89	78	98	85	74	94	82	69	90	79	64	87	76	62	81	68	57	76	62	49	69	58	43	
			Exposed	94	82	68	89	78	64	85	74	60	82	69	57	78	65	53	75	62	49	71	59	44	64	53	56	59	45	49	54	52	47	
10	B	0-7	Interior	99	95	82	99	90	78	99	85	73	95	81	67	91	78	63	87	74	61	83	69	58	76	62	51	68	57	43	62	51	56	
			Exposed	91	77	63	85	72	60	81	66	57	77	63	52	73	60	47	67	57	43	64	53	58	59	45	50	52	57	43	45	50	37	
		7-20	Interior	99	99	91	99	94	86	99	89	81	99	85	77	99	81	73	98	77	67	93	73	64	86	64	58	81	60	52	76	55	45	
			Exposed	99	91	73	96	76	66	92	71	62	87	65	59	84	62	56	80	59	52	77	57	47	69	48	58	63	59	52	59	54	45	
		20-27	Interior	100	100	97	100	100	92	100	97	87	100	92	83	96	88	80	91	84	76	87	81	72	80	75	64	74	67	59	66	62	54	
			Exposed	95	88	80	90	83	76	85	79	70	81	76	65	77	72	62	74	67	59	68	63	56	62	58	48	57	52	59	50	45	54	
	C	0-7	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	
			Exposed	92	92	91	92	92	86	92	92	82	92	90	78	92	87	75	92	87	75	92	80	66	85	75	60	80	67	56	75	62	48	
		7-20	Interior	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	
			Exposed	92	92	88	92	92	83	92	91	79	92	86	75	92	82	69	92	79	64	88	76	62	81	66	57	75	61	49	67	57	43	
		20-27	Interior	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	
			Exposed	96	96	96	96	96	91	96	95	86	96	90	82	96	86	78	96	82	75	96	79	70	92	71	62	85	63	58	80	59	51	
	D	0-7	Interior	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	
			Exposed	99	99	99	99	99	98	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	
		7-20	Interior	92	92	86	92	92	81	92	89	78	92	85	74	92	82	69	90	79	64	87	76	62	81	68	57	76	62	49	69	58	43	
			Exposed	92	82	68	89	78	64	85	74	60	82	69	57	78	65	53	75	62	49	71	59	44	64	53	56	59	45	49	54	52	47	
		20-27	Interior	91	77	63	85	72	60	81	66	57	77	63	52	73	60	47	67	57	43	64	53	58	59	45	50	52	57	43	45	50	37	
			Exposed	97	97	91	97	94	86	97	89	81	97	85	77	97	81	73	97	77	67	93	73	64	86	64	58	81	60	52	76	55	45	
20	B	0-7	Interior	97	97	91	97	94	86	97	89	81	97	85	77	97	81	73	97	77	67	93	73	64	86	64	58	81	60	52	76	55	45	
			Exposed	97	81	73	96	76	66	92	71	62	87	65	59	84	62	56	80	59	52	77	57	47	69	48	58	63	59	52	59	54	45	
		7-20	Interior	99	99	97	99	99	92	99	97	87	99	92	83	96	88	80	91	84	76	87	81	72	80	75	64	74	67	59	66	62	54	
			Exposed	95	88	80	90	83	76	85	79	70	81	76	65	77	72	62	74	67	59	68	63	56	62	58	48	57	52	59	50	45	54	
		20-27	Interior	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	
			Exposed	83	83	83	83	83	83	83	83	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	
	C																																	

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[illegible]

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ASCE 7-22
Design Standard

II
Risk Category

30 ft
Roof Height

Ss = 3.00
Seismic

23 sq.ft
Module Area

PORTRAIT
Orientation

CROSS-SLOPE
Rail Direction

SML
Rail Type

PRO SERIES
Clamp

Flashloc DUO Rafter
Attachment

SPAN TABLES

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

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Panel Exposure	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				90			95			100			105			110			115			120			130			140			150			160			170			180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
0	B	0-7	Interior	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78

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

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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.

[illegible]

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

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

[illegible]

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

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

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