

### Design Criteria for Span Tables:

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

#### Building Assumptions

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

#### Wind Design Assumptions

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

#### Snow Design Assumptions

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

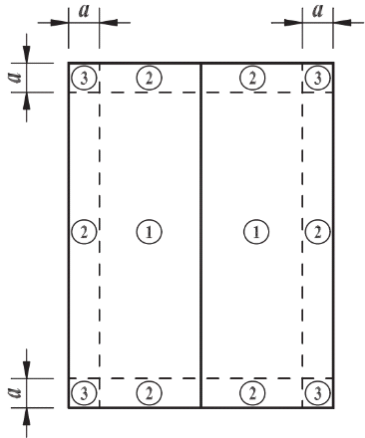
#### Seismic Design Assumptions

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

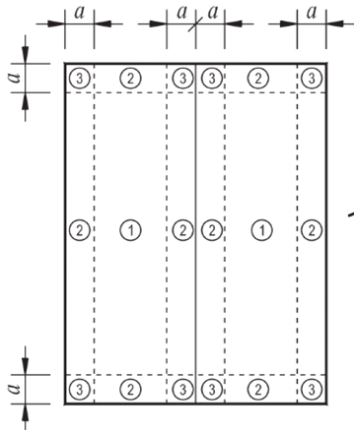
#### Array Assumptions

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

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

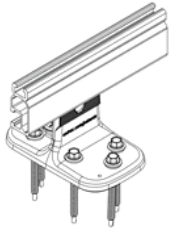


Gable Roofs  $\theta \leq 7^\circ$



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

Rails can be installed in these possible orientations.

| *Flashloc DUO for Plywood |                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------|
| Y+                        |  |
| Y-                        | Alternate orientation not allowed                                                    |



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

18.66 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

**Ss = 1.25**  
Seismic

18.66 sq.ft

Module Area

## ORIENTATION

**CROSS-SLOPE**  
Rail Direction

SML

**PRO SERIES**  
Clamp

Flashloc DUO Plywood

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

[illegible]

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

|    |                                                                                                                                                                                                    |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.                                                                                                     |
| 10 | Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support. |



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

18.66 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

18.66 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

22.78 sq.ft

Module Area

**CROSS-SLOPE**  
Rail Direction

**PRO SERIES**  
Clamp

Flashloc DUO Plywood

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

| Ground Snow Load (psf) |   |       | Wind Exposure Category |    |    | Roof Tilt Angle (deg) |    |    | Basic Wind Speed (mph) |    |    |    |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |      |     |    |    |     |    |    |     |    |    |     |    |    |     |
|------------------------|---|-------|------------------------|----|----|-----------------------|----|----|------------------------|----|----|----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|------|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|
|                        |   |       |                        |    |    |                       |    |    | Roof Wind Zone         |    |    |    |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |      |     |    |    |     |    |    |     |    |    |     |    |    |     |
|                        |   |       |                        |    |    |                       |    |    | 90                     |    |    | 95 |    |    | 100 |    |    | 105 |    |    | 110 |    |    | 115 |    |    | 120 |    |      | 130 |    |    | 140 |    |    | 150 |    |    | 160 |    |    | 170 |
| 1                      | 2 | 3     | 1                      | 2  | 3  | 1                     | 2  | 3  | 1                      | 2  | 3  | 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   | 39                     | 39 | 25 | 39                    | 36 | 22 | 39                     | 32 | 19 | 39 | 28 | 18 | 39  | 26 | 16 | 39  | 23 | 14 | 39  | 21 | 13 | 34  | 18 | 11 | 29  | 15 | 9    | 25  | 13 | 8  | 21  | 11 | 11 | 19  | 10 | 9  | 17  | 9  | 8  |     |
|                        |   | 7-27  | 39                     | 39 | 26 | 39                    | 38 | 23 | 39                     | 34 | 21 | 39 | 30 | 19 | 39  | 27 | 17 | 39  | 25 | 15 | 39  | 22 | 14 | 38  | 19 | 12 | 32  | 16 | 10   | 28  | 14 | 9  | 24  | 12 | 12 | 21  | 11 | 10 | 19  | 9  | 9  |     |
|                        |   | 27-45 | 40                     | 40 | 40 | 40                    | 40 | 40 | 40                     | 40 | 40 | 40 | 40 | 40 | 40  | 39 | 39 | 37  | 35 | 35 | 34  | 32 | 32 | 30  | 27 | 27 | 26  | 23 | 23   | 23  | 20 | 20 | 17  | 17 | 18 | 15  | 15 | 16 | 13  | 13 |    |     |
|                        | C | 0-7   | 39                     | 28 | 17 | 39                    | 24 | 15 | 39                     | 22 | 13 | 38 | 20 | 12 | 34  | 18 | 11 | 31  | 16 | 10 | 28  | 15 | 9  | 23  | 12 | 12 | 20  | 10 | 10   | 17  | 9  | 9  | 15  | 12 | 7  | 13  | 11 | 7  | 11  | 9  | 6  |     |
|                        |   | 7-27  | 39                     | 29 | 18 | 39                    | 26 | 16 | 39                     | 23 | 15 | 39 | 21 | 13 | 38  | 19 | 12 | 34  | 17 | 11 | 31  | 16 | 10 | 26  | 13 | 8  | 22  | 11 | 11   | 19  | 10 | 9  | 17  | 8  | 8  | 15  | 11 | 7  | 13  | 10 | 6  |     |
|                        |   | 27-45 | 40                     | 40 | 40 | 38                    | 37 | 37 | 35                     | 33 | 33 | 32 | 30 | 30 | 30  | 27 | 27 | 27  | 24 | 24 | 25  | 22 | 22 | 22  | 19 | 19 | 19  | 16 | 16   | 17  | 14 | 14 | 15  | 12 | 12 | 13  | 11 | 11 | 11  | 9  | 9  |     |
| 10                     | B | 0-7   | 39                     | 23 | 14 | 39                    | 20 | 13 | 35                     | 18 | 11 | 31 | 16 | 10 | 28  | 15 | 9  | 25  | 13 | 8  | 23  | 12 | 12 | 19  | 10 | 10 | 17  | 9  | 8    | 14  | 12 | 7  | 12  | 10 | 6  | 11  | 9  | 5  | 10  | 8  | 5  |     |
|                        |   | 7-27  | 39                     | 24 | 15 | 39                    | 21 | 14 | 39                     | 19 | 12 | 35 | 17 | 11 | 31  | 16 | 10 | 28  | 14 | 9  | 26  | 13 | 12 | 22  | 11 | 11 | 18  | 9  | 9    | 16  | 12 | 8  | 14  | 11 | 7  | 12  | 9  | 6  | 11  | 8  | 5  |     |
|                        |   | 27-45 | 36                     | 35 | 35 | 33                    | 31 | 31 | 30                     | 28 | 28 | 28 | 25 | 25 | 25  | 22 | 22 | 24  | 20 | 20 | 22  | 19 | 19 | 19  | 16 | 16 | 16  | 13 | 13   | 14  | 12 | 12 | 12  | 10 | 10 | 11  | 9  | 9  | 9   | 12 | 12 |     |
|                        | C | 0-7   | 28                     | 28 | 25 | 28                    | 22 | 28 | 28                     | 19 | 28 | 28 | 18 | 28 | 26  | 16 | 28 | 23  | 14 | 28 | 21  | 13 | 28 | 18  | 11 | 28 | 15  | 9  | 25   | 13  | 8  | 21 | 11  | 11 | 19 | 10  | 9  | 17 | 9   | 8  |    |     |
|                        |   | 7-27  | 28                     | 28 | 26 | 28                    | 28 | 23 | 28                     | 28 | 21 | 28 | 28 | 19 | 28  | 27 | 17 | 28  | 25 | 15 | 28  | 22 | 14 | 28  | 19 | 12 | 28  | 16 | 10   | 27  | 14 | 9  | 24  | 12 | 12 | 21  | 11 | 10 | 19  | 9  | 9  |     |
|                        |   | 27-45 | 39                     | 39 | 39 | 39                    | 39 | 39 | 39                     | 39 | 39 | 39 | 39 | 39 | 39  | 38 | 38 | 38  | 36 | 35 | 35  | 34 | 32 | 32  | 30 | 27 | 27  | 26 | 23   | 23  | 23 | 20 | 20  | 20 | 17 | 17  | 18 | 15 | 15  | 16 | 13 | 13  |
| 20                     | B | 0-7   | 28                     | 28 | 17 | 28                    | 24 | 15 | 28                     | 22 | 13 | 28 | 20 | 12 | 28  | 18 | 11 | 28  | 16 | 10 | 28  | 15 | 9  | 23  | 12 | 12 | 20  | 10 | 10   | 17  | 9  | 9  | 15  | 12 | 7  | 13  | 11 | 7  | 11  | 9  | 6  |     |
|                        |   | 7-27  | 28                     | 28 | 18 | 28                    | 26 | 16 | 28                     | 23 | 15 | 28 | 21 | 13 | 28  | 19 | 12 | 28  | 17 | 11 | 28  | 16 | 10 | 26  | 13 | 8  | 22  | 11 | 11   | 19  | 10 | 9  | 17  | 8  | 8  | 15  | 11 | 7  | 13  | 10 | 6  |     |
|                        |   | 27-45 | 39                     | 39 | 39 | 37                    | 37 | 37 | 35                     | 33 | 33 | 32 | 30 | 30 | 30  | 27 | 27 | 27  | 24 | 24 | 25  | 22 | 22 | 22  | 19 | 19 | 19  | 16 | 16   | 17  | 14 | 14 | 15  | 12 | 12 | 13  | 11 | 11 | 11  | 9  | 9  |     |
|                        | C | 0-7   | 28                     | 23 | 14 | 28                    | 20 | 13 | 28                     | 18 | 11 | 28 | 16 | 10 | 28  | 15 | 9  | 25  | 13 | 8  | 23  | 12 | 12 | 19  | 10 | 10 | 17  | 9  | 8    | 14  | 12 | 7  | 12  | 10 | 6  | 11  | 9  | 5  | 10  | 8  | 5  |     |
|                        |   | 7-27  | 28                     | 24 | 15 | 28                    | 21 | 14 | 28                     | 19 | 12 | 28 | 17 | 11 | 28  | 16 | 10 | 27  | 14 | 9  | 26  | 13 | 12 | 22  | 11 | 11 | 18  | 9  | 9    | 16  | 12 | 8  | 14  | 11 | 7  | 12  | 9  | 6  | 11  | 8  | 5  |     |
|                        |   | 27-45 | 36                     | 35 | 35 | 33                    | 31 | 31 | 30                     | 28 | 28 | 28 | 25 | 25 | 25  | 22 | 22 | 24  | 20 | 20 | 22  | 19 | 19 | 19  | 16 | 16 | 16  | 13 | 13   | 14  | 12 | 12 | 12  | 10 | 10 | 11  | 9  | 9  | 9   | 12 | 12 |     |
| 30                     | B | 0-7   | 19                     | 19 | 19 | 19                    | 19 | 19 | 19                     | 19 | 19 | 19 | 19 | 18 | 19  | 19 | 16 | 19  | 19 | 14 | 19  | 19 | 13 | 19  | 18 | 11 | 19  | 15 | 9    | 19  | 13 | 8  | 19  | 11 | 11 | 19  | 10 | 9  | 17  | 9  | 8  |     |
|                        |   | 7-27  | 19                     | 19 | 19 | 19                    | 19 | 19 | 19                     | 19 | 19 | 19 | 19 | 19 | 19  | 19 | 17 | 19  | 19 | 15 | 19  | 19 | 14 | 19  | 19 | 12 | 19  | 16 | 10   | 19  | 14 | 9  | 18  | 12 | 12 | 17  | 11 | 10 | 17  | 9  | 9  |     |
|                        |   | 27-45 | 32                     | 32 | 32 | 32                    | 32 | 32 | 32                     | 32 | 32 | 32 | 32 | 31 | 31  | 31 | 30 | 30  | 29 | 29 | 29  | 26 | 26 | 24  | 23 | 23 | 23  | 22 | 20   | 20  | 20 | 17 | 17  | 18 | 15 | 15  | 16 | 13 | 13  |    |    |     |
|                        | C | 0-7   | 19                     | 19 | 17 | 19                    | 19 | 15 | 19                     | 19 | 13 | 19 | 19 | 12 | 19  | 18 | 11 | 19  | 16 | 10 | 19  | 15 | 9  | 19  | 12 | 12 | 19  | 10 | 10   | 17  | 9  | 9  | 15  | 12 | 7  | 13  | 11 | 7  | 11  | 9  | 6  |     |
|                        |   | 7-27  | 19                     | 19 | 18 | 19                    | 19 | 16 | 19                     | 19 | 15 | 19 | 19 | 13 | 19  | 19 | 19 | 12  | 19 | 17 | 11  | 19 | 16 | 10  | 19 | 13 | 8   | 18 | 11   | 11  | 17 | 10 | 9   | 16 | 8  | 8   | 15 | 11 | 7   | 13 | 10 | 6   |
|                        |   | 27-45 | 32                     | 32 | 32 | 31                    | 31 | 31 | 29                     | 29 | 29 | 28 | 28 | 26 | 26  | 25 | 24 | 24  | 24 | 22 | 22  | 22 | 21 | 21  | 19 | 19 | 19  | 16 | 16   | 17  | 14 | 14 | 15  | 12 | 12 | 13  | 11 | 11 | 11  | 9  | 9  |     |
| 40                     | B | 0-7   | 19                     | 19 | 14 | 19                    | 19 | 13 | 19                     | 18 | 11 | 19 | 16 | 10 | 19  | 15 | 9  | 19  | 13 | 8  | 19  | 12 | 12 | 19  | 10 | 10 | 17  | 9  | 8    | 14  | 12 | 7  | 12  | 10 | 6  | 11  | 9  | 5  | 10  | 8  | 5  |     |
|                        |   | 7-27  | 19                     | 19 | 15 | 19                    | 19 | 14 | 19                     | 19 | 12 | 19 | 17 | 11 | 19  | 16 | 10 | 19  | 14 | 9  | 19  | 13 | 12 | 18  | 11 | 11 | 17  | 9  | 9    | 16  | 12 | 8  | 14  | 11 | 7  | 12  | 9  | 6  | 11  | 8  | 5  |     |
|                        |   | 27-45 | 31                     | 31 | 31 | 29                    | 29 | 29 | 27                     | 27 | 27 | 26 | 25 | 25 | 24  | 22 | 22 | 23  | 20 | 20 | 22  | 19 | 19 | 19  | 16 | 16 | 16  | 13 | 13   | 14  | 12 | 12 | 12  | 10 | 10 | 11  | 9  | 9  | 9   | 12 | 12 |     |
|                        | C | 0-7   | 19                     | 19 | 19 | 19                    | 19 | 19 | 19                     | 19 | 19 | 19 | 19 | 18 | 19  | 19 | 16 | 19  | 19 | 14 | 19  | 19 | 13 | 19  | 18 | 11 | 19  | 15 | 9    | 19  | 13 | 8  | 19  | 11 | 11 | 19  | 10 | 9  | 17  | 9  | 8  |     |
|                        |   | 7-27  | 19                     | 19 | 19 | 19                    | 19 | 19 | 19                     | 19 | 19 | 19 | 19 | 19 | 19  | 19 | 17 | 19  | 19 | 15 | 19  | 19 | 14 | 19  | 19 | 12 | 19  | 16 | 10   | 19  | 14 | 9  | 18  | 12 | 12 | 17  | 11 | 10 | 17  | 9  | 9  |     |
|                        |   | 27-45 | 27                     | 27 | 27 | 27                    | 27 | 27 | 27                     | 27 | 27 | 27 | 27 | 27 | 27  | 27 | 27 | 26  | 26 | 26 | 25  | 25 | 25 | 23  | 23 | 23 | 21  | 21 | 21   | 19  | 19 | 19 | 18  | 17 | 17 | 15  | 15 | 15 | 13  | 13 |    |     |
| 50                     | B | 0-7   | 15                     | 15 | 15 | 15                    | 15 | 15 | 15                     | 15 | 15 | 15 | 15 | 15 | 15  | 15 | 15 | 15  | 14 | 15 | 15  | 13 | 15 | 15  | 11 | 15 | 15  | 9  | 15   | 13  | 8  | 15 | 11  | 11 | 15 | 10  | 9  | 15 | 9   | 8  |    |     |
|                        |   | 7-27  | 16                     | 16 | 16 | 16                    | 16 | 16 | 16                     | 16 | 16 | 16 | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16   | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 |     |
|                        |   | 27-45 | 23                     | 23 | 23 | 23                    | 23 | 23 | 23                     | 23 | 23 | 23 | 23 | 23 | 23  | 23 | 23 | 22  | 22 | 22 | 21  | 21 | 21 | 20  | 20 | 20 | 19  | 19 | 19   | 17  | 17 | 17 | 16  | 16 | 16 | 15  | 15 | 14 | 13  | 13 |    |     |
|                        | C | 0-7   | 15                     | 15 | 15 | 15                    | 15 | 15 | 15                     | 15 | 13 | 15 | 15 | 12 | 15  | 15 | 11 | 15  | 15 | 10 | 15  | 15 | 9  | 15  | 12 | 12 | 15  | 10 | 10   | 15  | 9  | 9  | 15  | 12 | 7  | 13  | 11 | 7  | 11  | 9  | 6  |     |
|                        |   | 7-27  | 16                     | 16 | 16 | 16                    | 16 | 16 | 16                     | 16 | 16 | 16 | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16   | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 | 16  | 16 | 16 |     |
|                        |   | 27-45 | 23                     | 23 | 23 | 23                    | 23 | 23 | 22                     | 22 | 22 | 21 | 21 | 21 | 20  | 20 | 20 | 19  | 19 | 19 | 18  | 18 | 17 | 17  | 17 | 17 | 17  | 16 | 16   | 16  | 14 | 14 | 14  | 13 | 12 | 12  | 11 | 11 | 11  | 9  | 9  |     |
| 60                     | B | 0-7   | 12                     | 12 | 12 | 12                    | 12 | 12 | 12                     | 12 | 12 | 12 | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12   | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 |     |
|                        |   | 7-27  | 28                     | 28 | 28 | 28                    | 28 | 28 | 28                     | 28 | 28 | 28 | 28 | 28 | 28  | 28 | 28 | 28  | 28 | 28 | 28  | 28 | 28 | 28  | 28 | 28 | 28  | 28 | 28   | 28  | 28 | 28 | 28  | 28 | 28 | 28  | 28 | 28 | 28  | 28 | 28 |     |
|                        |   | 27-45 | 31                     | 31 | 31 | 31                    | 31 | 31 | 31                     | 31 | 31 | 31 | 31 | 31 | 31  | 31 | 31 | 30  | 30 | 30 | 29  | 29 | 29 | 27  | 27 | 27 | 25  | 25 | 25   | 24  | 24 | 24 | 22  | 22 | 22 | 21  | 21 | 21 | 20  | 20 | 20 | 20  |
|                        | C | 0-7   | 12                     | 12 | 12 | 12                    | 12 | 12 | 12                     | 12 | 12 | 12 | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12   | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 | 12  | 12 | 12 |     |
|                        |   | 7-27  | 28                     | 28 | 28 | 28                    | 28 | 25 | 28                     | 28 | 22 | 28 | 28 | 20 | 28  | 28 | 18 | 28  | 26 | 16 | 28  | 24 | 15 | 27  | 20 | 13 | 26  | 17 | 11   | 25  | 15 | 9  | 24  | 13 | 8  | 22  | 11 | 7  | 20  | 10 | 6  |     |
|                        |   | 27-45 | 31                     | 31 | 31 | 30                    | 30 | 29 | 29                     | 29 | 28 | 28 | 28 | 27 | 27  | 26 | 26 | 26  | 25 | 25 | 25  | 23 | 23 | 23  | 22 | 22 | 22  | 20 | 20</ |     |    |    |     |    |    |     |    |    |     |    |    |     |

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

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

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



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

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

22.78 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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



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

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
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LANDSCAPE  
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CROSS-SLOPE  
Rail Direction

SML  
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PRO SERIES  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

22.78 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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



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

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

22.78 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

PRO SERIES  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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





ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

18.66 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

**Ss = 1.25**  
Seismic

18.66 sq.ft  
Module Area

## ORIENTATION

**CROSS-SLOPE**  
Rail Direction

SML

UAF

Clamp

Flashloc DUO Plywood

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

[illegible]

• Cells with an asterisks indicates that the L-root must be oriented in the Y- direction as indicated in the image.

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

18.66 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

Ss = 1.25  
Seismic

18.66 sq.ft

Module Area

## LANDSCAPE

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF

Clamp

Flashloc DUO Plywood

Attachment

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

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

• Cells with an asterisks indicates that the L-root must be oriented in the Y- direction as indicated in the image.

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

22.78 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

$$S_s = 1.25$$

22.78 sq.ft  
Module Area

## Portrait

**CROSS-SLOPE**  
Rail Direction

SML  
Rail Type

UAF

Clamp

Flashloc DUO Plywood

Attachment

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

[illegible]

• Cells with an asterisks indicates that the L-root must be oriented in the Y- direction as indicated in the image.

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

22.78 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

**Ss = 1.25**  
Seismic

22.78 sq.ft

## LANDSCAPE

**CROSS-SLOPE**  
Rail Direction

SML  
Rail Type

UAF

Clamp

Flashloc DUO Plywood

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

[illegible]

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

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

**Ss = 3.00**

18.66 sq.ft

Module Area

## Portrait

**CROSS-SLOPE**  
Rail Direction

SML

UAF

Clamp

Flashloc DUO Plywood

Attachment

# SPAN TABLES

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

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

- Cells with an asterisks indicates that the L-foot must be oriented in the Y- direction as indicated in the image.
- 10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.
- 10 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



30 ft  
Roof Height

18.66 sq.ft

Module Area

**CROSS-SLOPE**  
Rail Direction

UAF

Clamp

Flashloc DUO Plywood

Attachment

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

[illegible]

• Cells with an asterisks indicates that the L-root must be oriented in the Y- direction as indicated in the image.

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

22.78 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

22.78 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashloc DUO Plywood  
Attachment

# SPAN TABLES

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

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



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

22.78 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF  
Clamp

Flashlok DUO Plywood  
Attachment

# SPAN TABLES

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

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



II  
Risk Category

30 ft  
Roof Height

**Ss = 3.00**  
Seismic

22.78 sq.ft

## LANDSCAPE

CROSS-SLOPE  
Rail Direction

SML  
Rail Type

UAF

Clamp

Flashloc DUO Plywood

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

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

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

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

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