

**Design Criteria for Span Tables:**

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

**Building Assumptions**

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

**Wind Design Assumptions**

- Wind loads used are based on ASCE 7-22 Sec. 29.4.4
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor,  $k_{zt} = 1.0$
- $\gamma_E = 1.0$  for 'Interior' spans,  $\gamma_E = 1.5$  for 'Exposed' spans (ASCE 7-22, Fig. 29.4-7)

**Snow Design Assumptions**

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

**Seismic Design Assumptions**

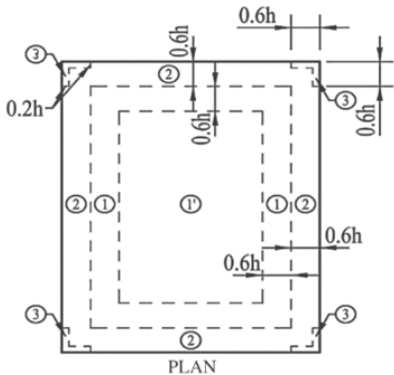
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$  and 3 with  $S_{ds} = 1, 2.4$  respectively per criteria shown on individual span tables sheets.
- $S_1 = 0.5$  &  $S_{d1} = 0.6$
- Seismic site class D

**Array Assumptions**

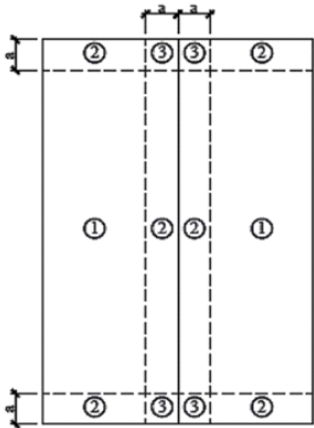
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at least twice the module height above roof surface.
- Modules are parallel to roof surface and maximum height above roof surface is 5" to 10" depending on attachment type.
- Gaps between module rows and columns is 0.25" in to 1" depending on clamp type.
- The most restrictive of all roof zone spans shall be used when any part of the module is attributed to that span.
- 'Exposed' spans as defined in ASCE 7-22 sec. 29.4.4 shall be used when any part of an exposed module or panel as is attributed to that span.

Span Tables

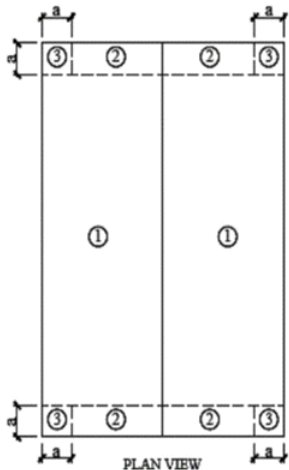
Zone should be considered as per ASCE 7-22, Fig. 30.3-2A to 30.3-2D



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



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



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

Rails can be installed in these possible orientations.

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



ASCE 7-22  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

19 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

NXT  
Rail Type

NXT COMBO  
Clamp

Flashloc DUO OSB  
Attachment

SPAN TABLES

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

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

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

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

[illegible]

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

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

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

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

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

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

[illegible]

\* Cells with an astrisks 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.

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 7-22  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

23 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

NXT  
Rail Type

NXT COMBO  
Clamp

Flashloc DUO OSB  
Attachment

# SPAN TABLES

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

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

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Panel Exposure | 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  |     |   |   |
| 30                     | B                      | 0-7                   | Interior       | 13                     | 13 | 13 | 13 | 13 | 13 | 13  | 13 | 13 | 13  | 13 | 13 | 13  | 13 | 13 | 13  | 13 | 13 | 13  | 13 | 13 | 13  | 13 | 13 | 13  | 12 | 9  | 13  | 11 | 7  | 13  | 9  | 7  | 12  | 8 | 6  |     |   |   |
|                        |                        |                       | Exposed        | 13                     | 13 | 13 | 13 | 13 | 13 | 13  | 13 | 13 | 13  | 13 | 12 | 13  | 13 | 11 | 13  | 13 | 10 | 13  | 13 | 9  | 13  | 11 | 8  | 13  | 9  | 6  | 11  | 8  | 5  | 10  | 7  | 5  | 8   | 6 | 6  | 7   | 5 | 6 |
|                        |                        | 7-20                  | Interior       | 14                     | 14 | 14 | 14 | 14 | 14 | 14  | 14 | 14 | 14  | 14 | 14 | 14  | 14 | 14 | 14  | 14 | 14 | 13  | 14 | 12 | 14  | 14 | 10 | 14  | 12 | 9  | 14  | 10 | 8  | 12  | 9  | 7  | 11  | 8 | 6  | 10  | 7 | 5 |
|                        |                        |                       | Exposed        | 14                     | 14 | 14 | 14 | 14 | 14 | 14  | 14 | 14 | 12  | 14 | 14 | 11  | 14 | 13 | 10  | 14 | 12 | 9   | 14 | 11 | 8   | 13 | 9  | 7   | 11 | 8  | 6   | 9  | 7  | 5   | 8  | 6  | 6   | 7 | 5  | 6   |   |   |
|                        |                        | 20-27                 | Interior       | 17                     | 17 | 17 | 17 | 17 | 17 | 17  | 17 | 17 | 17  | 17 | 17 | 17  | 17 | 17 | 17  | 17 | 17 | 16  | 17 | 15 | 17  | 15 | 13 | 17  | 13 | 11 | 17  | 11 | 9  | 17  | 10 | 8  | 15  | 9 | 7  | 13  | 8 | 6 |
|                        |                        |                       | Exposed        | 17                     | 17 | 17 | 17 | 17 | 16 | 17  | 17 | 14 | 17  | 16 | 13 | 17  | 14 | 12 | 17  | 13 | 11 | 17  | 12 | 10 | 17  | 10 | 8  | 15  | 8  | 7  | 13  | 7  | 6  | 11  | 6  | 5  | 10  | 5 | 7  | 8   | 5 | 6 |
|                        | C                      | 0-7                   | Interior       | 20                     | 20 | 20 | 20 | 20 | 20 | 20  | 20 | 20 | 20  | 20 | 20 | 20  | 20 | 20 | 20  | 20 | 20 | 20  | 20 | 20 | 20  | 20 | 20 | 18  | 20 | 16 | 14  | 11 | 14 | 12  | 10 | 12 | 11  | 8 | 11 | 10  | 7 |   |
|                        |                        |                       | Exposed        | 20                     | 20 | 20 | 20 | 20 | 20 | 19  | 20 | 20 | 17  | 20 | 20 | 15  | 20 | 18 | 14  | 18 | 16 | 13  | 17 | 15 | 12  | 14 | 12 | 10  | 12 | 11 | 8   | 10 | 9  | 7   | 9  | 8  | 6   | 8 | 7  | 6   | 5 |   |
|                        |                        | 7-20                  | Interior       | 13                     | 13 | 13 | 13 | 13 | 13 | 13  | 13 | 9  | 13  | 12 | 8  | 13  | 11 | 7  | 13  | 10 | 7  | 12  | 9  | 6  | 10  | 7  | 5  | 9   | 6  | 7  | 5   | 8  | 6  | 10  | 7  | 5  | 9   | 6 | 7  | 8   | 6 | 6 |
|                        |                        |                       | Exposed        | 14                     | 14 | 10 | 14 | 12 | 9  | 14  | 11 | 8  | 14  | 10 | 7  | 12  | 9  | 6  | 11  | 8  | 6  | 10  | 7  | 5  | 9   | 6  | 7  | 5   | 8  | 6  | 7   | 5  | 8  | 6   | 7  | 7  | 5   | 6 | 7  | 5   | 5 |   |
|                        |                        | 20-27                 | Interior       | 17                     | 17 | 15 | 12 | 17 | 13 | 11  | 17 | 12 | 10  | 17 | 11 | 9   | 17 | 10 | 8   | 15 | 9  | 7   | 14 | 8  | 15  | 9  | 7  | 12  | 7  | 5  | 10  | 6  | 5  | 9   | 5  | 6  | 7   | 5 | 8  | 6   | 5 | 4 |
|                        |                        |                       | Exposed        | 20                     | 20 | 20 | 20 | 20 | 20 | 20  | 20 | 18 | 20  | 20 | 16 | 20  | 19 | 15 | 19  | 17 | 13 | 18  | 16 | 12 | 15  | 13 | 10 | 13  | 11 | 9  | 11  | 10 | 8  | 9   | 8  | 7  | 8   | 7 | 6  | 7   | 6 | 5 |
| D                      | 0-7                    | Interior              | 13             | 13                     | 13 | 13 | 13 | 13 | 13 | 12  | 13 | 13 | 11  | 13 | 13 | 10  | 13 | 12 | 9   | 13 | 11 | 8   | 13 | 9  | 7   | 11 | 8  | 6   | 10 | 7  | 5   | 8  | 6  | 7   | 5  | 6  | 6   | 5 | 5  |     |   |   |
|                        |                        | Exposed               | 13             | 13                     | 9  | 13 | 12 | 8  | 13 | 11  | 8  | 13 | 10  |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |   |    |     |   |   |

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

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 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.

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

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

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

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

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

[illegible]

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



ASCE 7-22  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

19 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

NXT  
Rail Type

NXT COMBO  
Clamp

Flashloc DUO OSB  
Attachment

# SPAN TABLES

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

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

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.

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



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

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

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

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



ASCE 7-22  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

19 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

NXT  
Rail Type

NXT COMBO  
Clamp

Flashloc DUO OSB  
Attachment

# SPAN TABLES

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

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



ASCE 7-22  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

23 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

NXT  
Rail Type

NXT COMBO  
Clamp

Flashloc DUO OSB  
Attachment

# SPAN TABLES

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

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

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

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



ASCE 7-22  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

23 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

NXT  
Rail Type

NXT COMBO  
Clamp

Flashloc DUO OSB  
Attachment

# SPAN TABLES

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

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

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

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

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

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

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

[illegible]

\* Cells with an astrisks 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.

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.