

### Design Criteria for Span Tables:

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

#### Building Assumptions

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

#### Wind Design Assumptions

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

#### Snow Design Assumptions

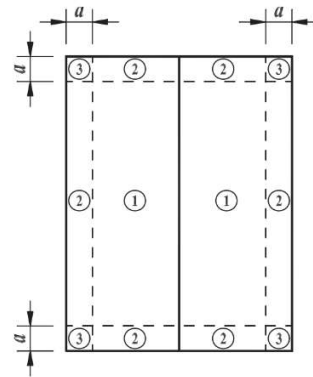
- Ground Snow Load = 0-100 psf
- Exposure Factor coefficients of Partially Exposed condition
- Thermal Factor = 1.0
- Results based on uniform snow load

#### Seismic Design Assumptions

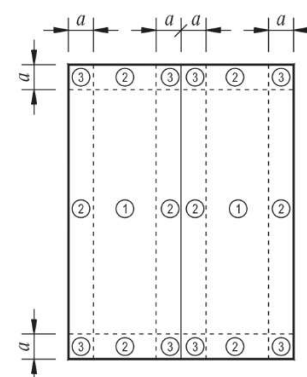
- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ , 3 per criteria shown on individual span tables sheets.
- $S_1 = 0.5$
- Seismic site class D

## Array Assumptions

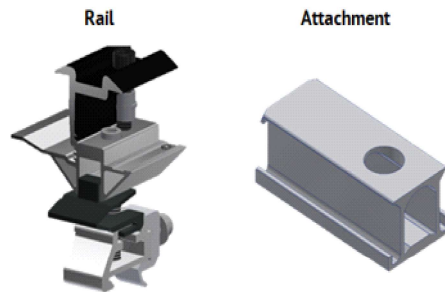
- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at least twice the module height above roof surface.
- Modules are parallel to roof surface and maximum height above roof surface is 5" to 10" depending on attachment type.
- Gaps between module rows and columns is 0.25" in to 1" depending on clamp type.
- The most restrictive of all roof zone spans shall be used when any part of the module is attributed to that span.
- Zone should be considered as per ASCE 7-16, Fig. 30.4-2A to 30.4-2D



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



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



Micro Rail - SFM Slider



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

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Basic Wind Speed (mph) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
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|                        |                        |                       | 90                     |     |     | 95  |     |     | 100 |     |     | 105 |     |     | 110 |     |     | 115 |     |     | 120 |     |     | 130 |     |     | 140 |     |    | 150 |    |    | 160 |    |    | 170 |    |    | 180 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        |                       | Roof Wind Zone         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        |                       | 1                      | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0                      | B                      | 0-7                   | 106                    | 106 | 106 | 106 | 106 | 105 | 106 | 106 | 97  | 106 | 105 | 90  | 106 | 99  | 84  | 106 | 94  | 79  | 106 | 89  | 75  | 101 | 80  | 67  | 92  | 74  | 61 | 85  | 68 | 50 | 79  | 63 | 42 | 74  | 58 | 35 | 70  | 50 | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 107                    | 107 | 93  | 107 | 107 | 87  | 107 | 107 | 82  | 107 | 103 | 78  | 107 | 97  | 74  | 107 | 92  | 70  | 107 | 87  | 67  | 107 | 80  | 61  | 98  | 73  | 54 | 91  | 67 | 46 | 84  | 63 | 40 | 79  | 59 | 34 | 74  | 51 | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 108                    | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 106 | 105 | 102 | 107 | 100 | 95  | 92  | 92  | 89  | 84  | 84 | 84  | 78 | 78 | 79  | 73 | 75 | 68  | 68 | 71 | 64  | 64 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | C                      | 0-7                   | 106                    | 103 | 88  | 106 | 96  | 82  | 106 | 90  | 76  | 106 | 85  | 71  | 100 | 80  | 67  | 95  | 76  | 63  | 91  | 72  | 59  | 83  | 66  | 47  | 76  | 60  | 38 | 71  | 52 | 31 | 66  | 44 | 26 | 62  | 38 | 22 | 58  | 32 | 19 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 107                    | 101 | 77  | 107 | 95  | 72  | 107 | 89  | 68  | 107 | 84  | 64  | 106 | 79  | 61  | 101 | 75  | 58  | 96  | 72  | 52  | 88  | 66  | 43  | 81  | 60  | 37 | 75  | 53 | 31 | 70  | 45 | 27 | 66  | 39 | 23 | 62  | 34 | 20 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 108                    | 108 | 108 | 108 | 108 | 108 | 103 | 102 | 102 | 99  | 96  | 96  | 95  | 91  | 91  | 92  | 87  | 87  | 88  | 83  | 83  | 82  | 76  | 76  | 77  | 70  | 70 | 70  | 72 | 65 | 65  | 67 | 61 | 61  | 63 | 55 | 55  | 59 | 48 | 48 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                     | D                      | 0-7                   | 106                    | 93  | 78  | 106 | 87  | 73  | 102 | 81  | 68  | 96  | 77  | 64  | 91  | 72  | 59  | 87  | 69  | 52  | 83  | 65  | 46  | 76  | 59  | 37  | 70  | 50  | 30 | 65  | 42 | 24 | 60  | 35 | 20 | 55  | 30 | 18 | 48  | 26 | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 107                    | 91  | 70  | 107 | 85  | 65  | 107 | 80  | 62  | 102 | 76  | 59  | 97  | 72  | 53  | 92  | 68  | 47  | 88  | 65  | 43  | 80  | 60  | 36  | 74  | 51  | 30 | 68  | 43 | 26 | 64  | 37 | 22 | 60  | 32 | 19 | 54  | 28 | 17 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 105                    | 104 | 104 | 101 | 98  | 98  | 96  | 93  | 92  | 88  | 88  | 88  | 83  | 83  | 85  | 79  | 79  | 82  | 76  | 76  | 76  | 69  | 69  | 71  | 64  | 64  | 66 | 59  | 59 | 62 | 52  | 57 | 45 | 45  | 50 | 40 | 40  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | B                      | 0-7                   | 89                     | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 75  | 89  | 80  | 67  | 89  | 74  | 61 | 85  | 68 | 50 | 79  | 63 | 42 | 74  | 58 | 35 | 70  | 50 | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 90                     | 90  | 90  | 90  | 90  | 87  | 90  | 90  | 82  | 90  | 90  | 78  | 90  | 90  | 90  | 90  | 90  | 90  | 90  | 90  | 87  | 67  | 90  | 80  | 61  | 90  | 73 | 54  | 90 | 67 | 46  | 84 | 63 | 40  | 79 | 59 | 34  | 74 | 51 | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 106                    | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 105 | 105 | 105 | 105 | 102 | 100 | 100 | 95 | 92  | 92 | 89 | 84  | 84 | 78 | 79  | 73 | 75 | 68  | 68 | 71 | 64 | 64 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 20                     | C                      | 0-7                   | 89                     | 89  | 88  | 89  | 89  | 82  | 89  | 89  | 76  | 89  | 85  | 71  | 89  | 80  | 67  | 89  | 76  | 63  | 89  | 72  | 59  | 83  | 66  | 47  | 76  | 60  | 38 | 71  | 52 | 31 | 66  | 44 | 26 | 62  | 38 | 22 | 58  | 32 | 19 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 90                     | 90  | 77  | 90  | 90  | 72  | 90  | 89  | 68  | 90  | 84  | 64  | 90  | 79  | 61  | 90  | 75  | 58  | 90  | 72  | 52  | 88  | 66  | 43  | 81  | 60  | 37 | 75  | 53 | 31 | 70  | 45 | 27 | 66  | 39 | 23 | 62  | 34 | 20 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 106                    | 106 | 106 | 106 | 106 | 106 | 103 | 102 | 102 | 99  | 96  | 96  | 95  | 91  | 91  | 92  | 87  | 87  | 88  | 83  | 83  | 82  | 76  | 76  | 77  | 70  | 70 | 70  | 72 | 65 | 65  | 67 | 61 | 61  | 63 | 55 | 55  | 59 | 48 | 48 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | D                      | 0-7                   | 89                     | 89  | 78  | 89  | 87  | 73  | 89  | 81  | 68  | 89  | 77  | 64  | 89  | 72  | 59  | 87  | 69  | 52  | 83  | 65  | 46  | 76  | 59  | 37  | 70  | 50  | 30 | 65  | 42 | 24 | 60  | 35 | 20 | 55  | 30 | 18 | 48  | 26 | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 90                     | 90  | 70  | 90  | 85  | 65  | 90  | 80  | 62  | 90  | 76  | 59  | 90  | 72  | 53  | 90  | 68  | 47  | 88  | 65  | 43  | 80  | 60  | 36  | 74  | 51  | 30 | 68  | 43 | 26 | 64  | 37 | 22 | 60  | 32 | 19 | 54  | 28 | 17 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 105                    | 104 | 104 | 101 | 98  | 98  | 96  | 93  | 92  | 88  | 88  | 88  | 83  | 83  | 85  | 79  | 79  | 82  | 76  | 76  | 76  | 69  | 69  | 71  | 64  | 64  | 66 | 59  | 59 | 62 | 52  | 57 | 45 | 45  | 50 | 40 | 40  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 30                     | B                      | 0-7                   | 74                     | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 61  | 74 | 61  | 74 | 68 | 50  | 74 | 63 | 42  | 74 | 58 | 35  | 70 | 50 | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 75                     | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |



30 ft  
Roof Height

**Ss = 1.25**

Seismic

18.66 sq.ft

Module Area

## ORIENTATION

**CROSS-SLOPE**  
Rail Direction

| Rail Type  |
|------------|
| Micro Rail |

SFM

Clamp

SFM Slider

Attachment

[illegible]





Category

30 ft  
Roof Height

**Ss = 1.25**  
Seismic

18.66 sq.ft

Module Area

## LANDSCAPE

**CROSS-SLOPE**  
Rail Direction

| Rail Type  |
|------------|
| Micro Rail |

SFM  
Clamp

SFM Slider

Attachment

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

[illegible]



30 ft  
Roof Height

22.78 sq.ft  
Module Area

CROSS-SLOPE  
Rail Direction

SFM  
Clamp

**SFM Slider**  
Attachment

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

[illegible]



30 ft  
Roof Height

$$S_s = 1.25$$

22.78 sq.ft  
Module Area

## ORIENTATION

**CROSS-SLOPE**  
Rail Direction

| Rail Type  | Number of Rail | Number of Rail | Number of Rail |
|------------|----------------|----------------|----------------|
| Micro Rail | 1              | 2              | 3              |

SFM  
Clamp

SFM Slider

Attachment

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

[illegible]



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 1.25  
Seismic

22.78 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

Micro Rail  
Rail Type

SFM  
Clamp

SFM Slider  
Attachment

# SPAN TABLES

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

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Basic Wind Speed (mph) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |     |    |    |    |    |
|------------------------|------------------------|-----------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|----|----|----|----|
|                        |                        |                       | 90                     |     |     | 95  |     |     | 100 |     |     | 105 |     |     | 110 |     |     | 115 |     |     | 120 |     |     | 130 |     |     | 140 |     |     | 150 |     |     | 160 |     |     | 170 |    |    | 180 |    |    |    |    |
|                        |                        |                       | Roof Wind Zone         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |     |    |    |    |    |
|                        |                        |                       | 1                      | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2  | 3  |     |    |    |    |    |
| 0                      | B                      | 0-7                   | 136                    | 136 | 136 | 136 | 136 | 125 | 136 | 136 | 115 | 136 | 114 | 136 | 131 | 108 | 136 | 123 | 101 | 136 | 116 | 95  | 136 | 110 | 90  | 128 | 100 | 81  | 117 | 91  | 74  | 109 | 84  | 68  | 101 | 78  | 63 | 95 | 73  | 58 | 89 | 68 | 49 |
|                        |                        | 7-27                  | 136                    | 136 | 117 | 136 | 136 | 110 | 136 | 136 | 104 | 136 | 129 | 98  | 136 | 122 | 93  | 136 | 115 | 88  | 136 | 110 | 84  | 136 | 100 | 77  | 125 | 92  | 71  | 115 | 85  | 66  | 107 | 79  | 61  | 100 | 73 | 57 | 94  | 69 | 50 |    |    |
|                        |                        | 27-45                 | 138                    | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 135 | 134 | 134 | 130 | 127 | 127 | 121 | 116 | 116 | 114 | 107 | 107 | 107 | 99  | 99  | 101 | 92  | 92  | 95  | 86 | 86 | 90  | 81 | 81 |    |    |
|                        | C                      | 0-7                   | 136                    | 129 | 106 | 136 | 119 | 98  | 136 | 112 | 92  | 135 | 105 | 86  | 128 | 100 | 81  | 121 | 94  | 77  | 116 | 90  | 73  | 106 | 82  | 66  | 97  | 75  | 60  | 90  | 69  | 51  | 84  | 64  | 42  | 79  | 60 | 35 | 74  | 53 | 31 |    |    |
|                        |                        | 7-27                  | 136                    | 127 | 96  | 136 | 118 | 91  | 136 | 111 | 86  | 136 | 105 | 81  | 136 | 100 | 77  | 129 | 95  | 73  | 122 | 90  | 70  | 112 | 82  | 64  | 103 | 76  | 59  | 95  | 70  | 51  | 89  | 65  | 44  | 83  | 61 | 38 | 78  | 56 | 34 |    |    |
|                        |                        | 27-45                 | 138                    | 138 | 138 | 138 | 137 | 137 | 132 | 129 | 129 | 126 | 122 | 122 | 121 | 116 | 116 | 117 | 110 | 110 | 112 | 105 | 105 | 104 | 96  | 96  | 97  | 89  | 89  | 91  | 82  | 82  | 85  | 77  | 77  | 80  | 72 | 72 | 75  | 68 | 68 |    |    |
| D                      | 0-7                    | 136                   | 115                    | 94  | 136 | 107 | 88  | 129 | 101 | 82  | 122 | 95  | 77  | 116 | 90  | 73  | 110 | 85  | 69  | 105 | 81  | 65  | 96  | 74  | 59  | 89  | 68  | 49  | 82  | 63  | 40  | 77  | 58  | 34  | 72  | 50  | 30 | 68 | 43  | 26 |    |    |    |
|                        | 7-27                   | 136                   | 114                    | 88  | 136 | 107 | 83  | 136 | 101 | 78  | 130 | 95  | 74  | 123 | 90  | 70  | 117 | 86  | 67  | 111 | 82  | 64  | 102 | 75  | 58  | 94  | 69  | 49  | 87  | 64  | 42  | 81  | 59  | 36  | 76  | 52  | 32 | 72 | 46  | 28 |    |    |    |
|                        | 27-45                  | 134                   | 132                    | 132 | 128 | 124 | 124 | 122 | 117 | 117 | 111 | 111 | 112 | 105 | 105 | 100 | 100 | 104 | 96  | 96  | 96  | 88  | 88  | 90  | 81  | 81  | 83  | 75  | 75  | 78  | 70  | 70  | 73  | 66  | 66  | 68  | 62 | 62 |     |    |    |    |    |
| 10                     | B                      | 0-7                   | 114                    | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 108 | 114 | 114 | 101 | 114 | 114 | 95  | 114 | 110 | 90  | 114 | 100 | 81  | 114 | 91  | 74  | 109 | 84  | 68  | 101 | 78  | 63  | 95  | 73  | 58 | 89 | 68  | 49 |    |    |    |
|                        |                        | 7-27                  | 115                    | 115 | 115 | 115 | 115 | 110 | 115 | 115 | 104 | 115 | 115 | 98  | 115 | 115 | 93  | 115 | 115 | 88  | 115 | 110 | 84  | 115 | 100 | 77  | 115 | 92  | 71  | 115 | 85  | 66  | 107 | 79  | 61  | 100 | 73 | 57 | 94  | 69 | 50 |    |    |
|                        |                        | 27-45                 | 136                    | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 134 | 134 | 134 | 130 | 127 | 127 | 121 | 116 | 116 | 114 | 107 | 107 | 107 | 99  | 99  | 101 | 92  | 92  | 95 | 86 | 86  | 90 | 81 | 81 |    |
|                        | C                      | 0-7                   | 114                    | 114 | 106 | 114 | 114 | 98  | 114 | 112 | 92  | 114 | 105 | 86  | 114 | 100 | 81  | 114 | 94  | 77  | 114 | 90  | 73  | 106 | 82  | 66  | 97  | 75  | 60  | 90  | 69  | 51  | 84  | 64  | 42  | 79  | 60 | 35 | 74  | 53 | 31 |    |    |
|                        |                        | 7-27                  | 115                    | 115 | 96  | 115 | 115 | 91  | 115 | 111 | 86  | 115 | 105 | 81  | 115 | 100 | 77  | 115 | 95  | 73  | 115 | 90  | 70  | 112 | 82  | 64  | 103 | 76  | 59  | 95  | 70  | 51  | 89  | 65  | 44  | 83  | 61 | 38 | 78  | 56 | 34 |    |    |
|                        |                        | 27-45                 | 136                    | 136 | 136 | 136 | 136 | 136 | 136 | 131 | 129 | 129 | 126 | 122 | 122 | 121 | 116 | 116 | 117 | 110 | 110 | 112 | 105 | 105 | 104 | 96  | 96  | 97  | 89  | 89  | 91  | 82  | 82  | 85  | 77  | 77  | 80 | 72 | 72  | 75 | 68 | 68 |    |
| D                      | 0-7                    | 114                   | 114                    | 94  | 114 | 107 | 88  | 114 | 101 | 82  | 114 | 95  | 77  | 114 | 90  | 73  | 110 | 85  | 69  | 105 | 81  | 65  | 96  | 74  | 59  | 89  | 68  | 49  | 82  | 63  | 40  | 77  | 58  | 34  | 72  | 50  | 30 | 68 | 43  | 26 |    |    |    |
|                        | 7-27                   | 115                   | 114                    | 88  | 115 | 107 | 83  | 115 | 101 | 78  | 115 | 95  | 74  | 115 | 90  | 70  | 115 | 86  | 67  | 111 | 82  | 64  | 102 | 75  | 58  | 94  | 69  | 49  | 87  | 64  | 42  | 81  | 59  | 36  | 76  | 52  | 32 | 72 | 46  | 28 |    |    |    |
|                        | 27-45                  | 134                   | 132                    | 132 | 128 | 124 | 124 | 122 | 117 | 117 | 111 | 111 | 112 | 105 | 105 | 108 | 100 | 104 | 96  | 96  | 96  | 88  | 88  | 90  | 81  | 81  | 83  | 75  | 75  | 78  | 70  | 70  | 73  | 66  | 66  | 68  | 62 | 62 |     |    |    |    |    |
| 20                     | B                      | 0-7                   | 95                     | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95 | 95 | 95  | 95 | 95 |    |    |
|                        |                        | 7-27                  | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96 | 96 | 96  | 96 | 96 | 96 |    |
|                        |                        | 27-45                 | 123                    | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 121 | 121 | 118 | 118 | 118 | 113 | 113 | 108 | 107 | 107 | 104 | 99  | 99  | 99  | 92  | 92  | 95  | 86  | 86 | 90 | 81  | 81 |    |    |    |
|                        | C                      | 0-7                   | 95                     | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 86  | 95  | 85  | 95  | 81  | 95  | 94  | 77  | 95  | 90  | 73  | 95  | 82  | 66  | 95  | 75  | 60  | 90  | 69  | 51  | 84  | 64  | 42  | 79 | 60 | 35  | 74 | 53 | 31 |    |
|                        |                        | 7-27                  | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96 | 96 | 96  | 96 | 96 | 96 |    |
|                        |                        | 27-45                 | 123                    | 123 | 123 | 122 | 122 | 122 | 119 | 119 | 116 | 116 | 116 | 116 | 113 | 113 | 113 | 113 | 110 | 110 | 107 | 105 | 105 | 102 | 96  | 96  | 97  | 89  | 89  | 91  | 82  | 82  | 85  | 77  | 77  | 80  | 72 | 72 | 75  | 68 | 68 |    |    |
| D                      | 0-7                    | 95                    | 95                     | 94  | 95  | 95  | 88  | 95  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85 | 85 | 85  | 85 | 85 |    |    |
|                        | 7-27                   | 96                    | 96                     | 88  | 96  | 96  | 83  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96 | 96 | 96  | 96 | 96 |    |    |
|                        | 27-45                  | 123                   | 123                    | 123 | 119 | 119 | 116 | 116 | 116 | 112 | 111 | 111 | 109 | 105 | 105 | 106 | 100 | 100 | 103 | 96  | 96  | 96  | 88  | 88  | 90  | 81  | 81  | 83  | 75  | 75  | 78  | 70  | 70  | 73  | 66  | 66  | 68 | 62 | 62  |    |    |    |    |
| 30                     | B                      | 0-7                   | 94                     | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94 | 94 | 94  | 94 | 94 |    |    |
|                        |                        | 7-27                  | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96 | 96 | 96  | 96 | 96 | 96 |    |
|                        |                        | 27-45                 | 113                    | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 111 | 111 | 109 | 109 | 109 | 105 | 105 | 101 | 101 | 101 | 97  | 97  | 97  | 94  | 92  | 92  | 90  | 86  | 86  | 87 | 81 | 81  |    |    |    |    |
|                        | C                      | 0-7                   | 94                     | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 94  | 86  | 94  | 94  | 81  | 94  | 94  | 77  | 94  | 90  | 73  | 94  | 82  | 66  | 94  | 75  | 60  | 90  | 69  | 51  | 84  | 64  | 42  | 79  | 60  | 35 | 74 | 53  | 31 |    |    |    |
|                        |                        | 7-27                  | 96                     | 96  | 96  | 96  | 96  | 91  | 96  | 96  | 86  | 96  | 96  | 81  | 96  | 96  | 77  | 96  | 95  | 73  | 96  | 90  | 70  | 96  | 82  | 64  | 95  | 76  | 59  | 92  | 70  | 51  | 89  | 65  | 44  | 83  | 61 | 38 | 78  | 56 | 34 |    |    |
|                        |                        | 27-45                 | 113                    | 113 | 113 | 112 | 112 | 112 | 110 | 110 | 107 | 107 | 107 | 105 | 105 | 103 | 103 | 103 | 103 | 100 | 100 | 100 | 96  | 96  | 96  | 92  | 89  | 89  | 88  | 82  | 82  | 84  | 77  | 77  | 80  | 72  | 72 | 75 | 68  | 68 |    |    |    |
| D                      | 0-7                    | 95                    | 95                     | 94  | 95  | 95  | 88  | 95  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85 | 85 | 85  | 85 | 85 |    |    |
|                        | 7-27                   | 96                    | 96                     | 88  | 96  | 96  | 83  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96 | 96 | 96  | 96 | 96 |    |    |
|                        | 27-45                  | 113                   | 113                    | 113 | 110 | 110 | 110 | 108 | 108 | 108 | 105 | 105 | 105 | 102 | 102 | 102 | 100 | 100 | 97  | 96  | 96  | 93  | 88  | 88  | 88  | 81  | 81  | 83  | 75  | 75  | 78  | 70  | 70  | 73  | 66  | 66  | 68 | 62 | 62  |    |    |    |    |
| 40                     | B                      | 0-7                   | 85                     | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85 | 85 | 85  | 85 | 85 |    |    |
|                        |                        | 7-27                  | 88                     | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  |     |     |     |     |     |     |     |     |     |     |     |     |    |    |     |    |    |    |    |



30 ft  
Roof Height

$$S_s = 1.25$$

22.78 sq.ft  
Module Area

## LANDSCAPE

### Orientation

**CROSS-SLOPE**  
Rail Direction

| Rail Type  | Number of Rail | Number of Rail | Number of Rail |
|------------|----------------|----------------|----------------|
| Micro Rail | 1              | 2              | 3              |

SFM  
Clamp

SFM Slider

Attachment

[illegible]



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

Micro Rail  
Rail Type

SFM  
Clamp

SFM Slider  
Attachment

# SPAN TABLES

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

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Basic Wind Speed (mph) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |    |
|------------------------|------------------------|-----------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|----|
|                        |                        |                       | 90                     |     |     | 95  |     |     | 100 |     |     | 105 |     |     | 110 |     |     | 115 |     |     | 120 |     |    | 130 |    |    | 140 |    |    | 150 |    |    | 160 |    |    | 170 |    |    | 180 |    |    |    |
|                        |                        |                       | Roof Wind Zone         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |    |
|                        |                        |                       | 1                      | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  |     |    |    |    |
| 0                      | B                      | 0-7                   | 102                    | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 97  | 102 | 102 | 90  | 102 | 99  | 84  | 102 | 94  | 79  | 102 | 89  | 75 | 101 | 80 | 67 | 92  | 74 | 61 | 85  | 68 | 50 | 79  | 63 | 42 | 74  | 58 | 35 | 70  | 50 | 30 |    |
|                        |                        | 7-27                  | 102                    | 102 | 93  | 102 | 102 | 87  | 102 | 102 | 82  | 102 | 102 | 78  | 102 | 97  | 74  | 102 | 92  | 70  | 102 | 87  | 67 | 102 | 80 | 61 | 98  | 73 | 54 | 91  | 67 | 46 | 84  | 63 | 40 | 79  | 59 | 34 | 74  | 51 | 30 |    |
|                        |                        | 27-45                 | 102                    | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 100 | 100 | 95 | 92  | 92 | 89 | 84  | 84 | 84 | 78  | 78 | 79 | 73  | 73 | 75 | 68  | 68 | 71 | 64  | 64 |    |    |
|                        | C                      | 0-7                   | 102                    | 102 | 88  | 102 | 96  | 82  | 102 | 90  | 76  | 102 | 85  | 71  | 100 | 80  | 67  | 95  | 76  | 63  | 91  | 72  | 59 | 83  | 66 | 47 | 76  | 60 | 38 | 71  | 52 | 31 | 66  | 44 | 26 | 62  | 38 | 22 | 58  | 32 | 19 |    |
|                        |                        | 7-27                  | 102                    | 101 | 77  | 102 | 95  | 72  | 102 | 89  | 68  | 102 | 84  | 64  | 102 | 79  | 61  | 101 | 75  | 58  | 96  | 72  | 52 | 88  | 66 | 43 | 81  | 60 | 37 | 75  | 53 | 31 | 70  | 45 | 27 | 66  | 39 | 23 | 62  | 34 | 20 |    |
|                        |                        | 27-45                 | 102                    | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 99  | 96  | 96  | 96  | 95  | 91  | 91  | 92  | 87  | 87  | 88  | 83 | 83  | 82 | 76 | 76  | 77 | 70 | 70  | 72 | 65 | 65  | 67 | 61 | 61  | 63 | 55 | 55  | 59 | 48 | 48 |
|                        | D                      | 0-7                   | 102                    | 93  | 78  | 102 | 87  | 73  | 102 | 81  | 68  | 96  | 77  | 64  | 91  | 72  | 59  | 87  | 69  | 52  | 83  | 65  | 46 | 76  | 59 | 37 | 70  | 50 | 30 | 65  | 42 | 24 | 60  | 35 | 20 | 55  | 30 | 18 | 48  | 26 | 16 |    |
|                        |                        | 7-27                  | 102                    | 91  | 70  | 102 | 85  | 65  | 102 | 80  | 62  | 102 | 76  | 59  | 97  | 72  | 53  | 92  | 68  | 47  | 88  | 65  | 43 | 80  | 60 | 36 | 74  | 51 | 30 | 68  | 43 | 26 | 64  | 37 | 22 | 60  | 32 | 19 | 54  | 28 | 17 |    |
|                        |                        | 27-45                 | 102                    | 102 | 102 | 101 | 98  | 98  | 96  | 93  | 93  | 92  | 88  | 88  | 88  | 83  | 83  | 85  | 79  | 79  | 82  | 76  | 76 | 69  | 69 | 71 | 64  | 64 | 66 | 59  | 59 | 62 | 52  | 52 | 57 | 45  | 45 | 50 | 40  | 40 |    |    |
| 10                     | B                      | 0-7                   | 89                     | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 89  | 84  | 89  | 89  | 79  | 89  | 89  | 75  | 89 | 80  | 67 | 89 | 74  | 61 | 85 | 68  | 50 | 79 | 63  | 42 | 74 | 58  | 35 | 70 | 50  | 30 |    |    |
|                        |                        | 7-27                  | 90                     | 90  | 90  | 90  | 90  | 87  | 90  | 90  | 82  | 90  | 90  | 78  | 90  | 90  | 74  | 90  | 90  | 70  | 90  | 87  | 67 | 90  | 80 | 61 | 90  | 73 | 54 | 90  | 67 | 46 | 84  | 63 | 40 | 79  | 59 | 34 | 74  | 51 | 30 |    |
|                        |                        | 27-45                 | 102                    | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 100 | 100 | 95 | 92  | 92 | 89 | 84  | 84 | 84 | 78  | 78 | 79 | 73  | 73 | 75 | 68  | 68 | 71 | 64  | 64 |    |    |
|                        | C                      | 0-7                   | 89                     | 89  | 88  | 89  | 89  | 82  | 89  | 89  | 76  | 89  | 85  | 71  | 89  | 80  | 67  | 89  | 76  | 63  | 89  | 72  | 59 | 83  | 66 | 47 | 76  | 60 | 38 | 71  | 52 | 31 | 66  | 44 | 26 | 62  | 38 | 22 | 58  | 32 | 19 |    |
|                        |                        | 7-27                  | 90                     | 90  | 77  | 90  | 90  | 72  | 90  | 89  | 68  | 90  | 84  | 64  | 90  | 79  | 61  | 90  | 75  | 58  | 90  | 72  | 52 | 88  | 66 | 43 | 81  | 60 | 37 | 75  | 53 | 31 | 70  | 45 | 27 | 66  | 39 | 23 | 62  | 34 | 20 |    |
|                        |                        | 27-45                 | 102                    | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 99  | 96  | 96  | 96  | 95  | 91  | 91  | 92  | 87  | 87  | 88  | 83  | 83 | 82  | 76 | 76 | 77  | 70 | 70 | 72  | 65 | 65 | 67  | 61 | 61 | 63  | 55 | 55 | 59  | 48 | 48 |    |
|                        | D                      | 0-7                   | 89                     | 89  | 78  | 89  | 87  | 73  | 89  | 81  | 68  | 89  | 77  | 64  | 89  | 72  | 59  | 87  | 69  | 52  | 83  | 65  | 46 | 76  | 59 | 37 | 70  | 50 | 30 | 65  | 42 | 24 | 60  | 35 | 20 | 55  | 30 | 18 | 48  | 26 | 16 |    |
|                        |                        | 7-27                  | 90                     | 90  | 70  | 90  | 85  | 65  | 90  | 80  | 62  | 90  | 76  | 59  | 90  | 72  | 53  | 90  | 68  | 47  | 88  | 65  | 43 | 80  | 60 | 36 | 74  | 51 | 30 | 68  | 43 | 26 | 64  | 37 | 22 | 60  | 32 | 19 | 54  | 28 | 17 |    |
|                        |                        | 27-45                 | 102                    | 102 | 102 | 101 | 98  | 98  | 96  | 93  | 93  | 92  | 88  | 88  | 88  | 83  | 83  | 85  | 79  | 79  | 82  | 76  | 76 | 69  | 69 | 71 | 64  | 64 | 66 | 59  | 59 | 62 | 52  | 52 | 57 | 45  | 45 | 50 | 40  | 40 |    |    |
| 20                     | B                      | 0-7                   | 74                     | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74 | 74  | 67 | 74 | 74  | 61 | 74 | 68  | 50 | 74 | 63  | 42 | 74 | 58  | 35 | 70 | 50  | 30 |    |    |
|                        |                        | 7-27                  | 75                     | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 74  | 75  | 75  | 75  | 75  | 75  | 75 | 67  | 75 | 75 | 61  | 75 | 73 | 54  | 75 | 67 | 46  | 75 | 63 | 40  | 74 | 59 | 34  | 73 | 51 | 30 |
|                        |                        | 27-45                 | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 95  | 95  | 95  | 95  | 93  | 93  | 89 | 89  | 89 | 85 | 84  | 84 | 81 | 78  | 78 | 73 | 73  | 75 | 68 | 68  | 71 | 64 | 64  |    |    |    |
|                        | C                      | 0-7                   | 74                     | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 67  | 74  | 74  | 63  | 74  | 72  | 59 | 74  | 66 | 47 | 74  | 60 | 38 | 71  | 52 | 31 | 66  | 44 | 26 | 62  | 38 | 22 | 58  | 32 | 19 |    |
|                        |                        | 7-27                  | 75                     | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75 | 67  | 75 | 75 | 61  | 75 | 73 | 54  | 75 | 67 | 46  | 75 | 63 | 40  | 74 | 59 | 34  | 73 | 51 | 30 |
|                        |                        | 27-45                 | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 93  | 93  | 91  | 91  | 91  | 89  | 89  | 86  | 86  | 86  | 84  | 83  | 83  | 80 | 76  | 76 | 76 | 70  | 70 | 72 | 65  | 65 | 67 | 61  | 61 | 63 | 55  | 55 | 59 | 48  | 48 |    |    |
|                        | D                      | 0-7                   | 74                     | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 68  | 74  | 74  | 64  | 74  | 72  | 59  | 74  | 69  | 52  | 74  | 65  | 46 | 74  | 59 | 37 | 70  | 50 | 30 | 65  | 42 | 24 | 60  | 35 | 20 | 55  | 30 | 18 | 48  | 26 | 16 |    |
|                        |                        | 7-27                  | 75                     | 75  | 70  | 75  | 75  | 65  | 75  | 75  | 62  | 75  | 75  | 59  | 75  | 72  | 53  | 75  | 68  | 47  | 75  | 65  | 43 | 74  | 60 | 36 | 72  | 51 | 30 | 68  | 43 | 26 | 64  | 37 | 22 | 60  | 32 | 19 | 54  | 28 | 17 |    |
|                        |                        | 27-45                 | 96                     | 96  | 96  | 93  | 93  | 93  | 91  | 91  | 88  | 88  | 88  | 86  | 83  | 83  | 83  | 79  | 79  | 81  | 76  | 76  | 69 | 69  | 69 | 71 | 64  | 64 | 66 | 59  | 59 | 62 | 52  | 52 | 57 | 45  | 45 | 50 | 40  | 40 |    |    |
| 30                     | B                      | 0-7                   | 73                     | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73 | 73  | 67 | 73 | 73  | 61 | 73 | 68  | 50 | 73 | 63  | 42 | 73 | 58  | 35 | 70 | 50  | 30 |    |    |
|                        |                        | 7-27                  | 75                     | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 74  | 75  | 75  | 75  | 75  | 75  | 75 | 67  | 75 | 75 | 61  | 75 | 73 | 54  | 75 | 67 | 46  | 75 | 63 | 40  | 74 | 59 | 34  | 73 | 51 | 30 |
|                        |                        | 27-45                 | 88                     | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 87  | 87  | 85  | 85  | 85  | 82  | 82 | 79  | 79 | 79 | 79  | 79 | 76 | 76  | 73 | 73 | 73  | 71 | 68 | 68  | 68 | 64 | 64  |    |    |    |
|                        | C                      | 0-7                   | 73                     | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 73  | 67  | 73  | 73  | 63  | 73  | 72  | 59 | 73  | 66 | 47 | 73  | 60 | 38 | 71  | 52 | 31 | 66  | 44 | 26 | 62  | 38 | 22 | 58  | 32 | 19 |    |
|                        |                        | 7-27                  | 75                     | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75 | 67  | 75 | 75 | 61  | 75 | 73 | 54  | 75 | 67 | 46  | 75 | 63 | 40  | 74 | 59 | 34  | 73 | 51 | 30 |
|                        |                        | 27-45                 | 88                     | 88  | 88  | 88  | 88  | 88  | 86  | 86  | 86  | 84  | 84  | 84  | 82  | 82  | 82  | 80  | 80  | 80  | 78  | 78  | 76 | 76  | 69 | 69 | 69  | 64 | 64 | 66  | 59 | 59 | 62  | 52 | 52 | 57  | 45 | 45 | 50  | 48 | 48 |    |
|                        | D                      | 0-7                   | 74                     | 74  | 74  | 74  | 74  | 74  | 74  | 74  | 68  | 74  | 74  | 64  | 74  | 72  | 59  | 74  | 69  | 52  | 74  | 65  | 46 | 74  | 59 | 37 | 70  | 50 | 30 | 65  | 42 | 24 | 60  | 35 | 20 | 55  | 30 | 18 | 48  | 26 | 16 |    |
|                        |                        | 7-27                  | 75                     | 75  | 70  | 75  | 75  | 65  | 75  | 75  | 62  | 75  | 75  | 59  | 75  | 72  | 53  | 75  | 68  | 47  | 75  | 65  | 43 | 74  | 60 | 36 | 72  | 51 | 30 | 68  | 43 | 26 | 64  | 37 | 22 | 60  | 32 | 19 | 54  | 28 | 17 |    |
|                        |                        | 27-45                 | 89                     | 89  | 89  | 87  | 87  | 87  | 84  | 84  | 82  | 82  | 82  | 82  | 82  | 80  | 80  | 80  | 78  | 78  | 78  | 76  | 76 | 76  | 69 | 69 | 69  | 64 | 64 | 66  | 59 | 59 | 62  | 52 | 52 | 57  | 45 | 45 | 50  | 40 | 40 |    |
| 40                     | B                      | 0-7                   | 67                     | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67  | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 63 | 42  | 67 | 58 | 35  | 67 | 50 | 30  |    |    |    |
|                        |                        | 7-27                  | 69                     | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69  | 69 | 69  | 69 | 69 | 69  | 69 | 69 | 69  | 69 | 69 | 69  | 63 | 40 | 68  | 59 | 34 | 67  | 51 | 30 |    |
|                        |                        | 27-45                 | 82                     | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 82  | 81  | 81  | 80  | 80  | 80  | 77 | 77  | 77 | 77 | 75  | 75 | 72 | 72  | 72 | 70 | 70  | 70 | 67 | 67  | 67 | 65 | 64  | 64 |    |    |
|                        | C                      | 0-7                   | 67                     | 67  | 67  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |    |



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

PORTRAIT  
Orientation

CROSS-SLOPE  
Rail Direction

Micro Rail  
Rail Type

SFM  
Clamp

SFM Slider  
Attachment

# SPAN TABLES

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

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Basic Wind Speed (mph) |    |    |    |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    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|                        |                        |                       | 90                     |    |    | 95 |    |    | 100 |    |    | 105 |    |    | 110 |    |    | 115 |    |    | 120 |    |    | 130 |    |    | 140 |    |    | 150 |    |    | 160 |    |    | 170 |    |    | 180 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    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|                        |                        |                       | Roof Wind Zone         |    |    |    |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    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|                        |                        |                       | 1                      | 2  | 3  | 1  | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    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| 60                     | B                      | 0-7                   | 55                     | 55 | 55 | 55 | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 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30 ft  
Roof Height

**Ss = 3.00**  
Seismic

18.66 sq.ft

Module Area

## LANDSCAPE

### Orientation

**CROSS-SLOPE**  
Rail Direction

| Rail Type  | Cost   | Capacity | Speed  | Flexibility | Environmental Impact |
|------------|--------|----------|--------|-------------|----------------------|
| Micro Rail | Low    | Low      | Low    | High        | Low                  |
| Light Rail | Medium | Medium   | Medium | Medium      | Medium               |
| Heavy Rail | High   | High     | High   | Low         | High                 |

SFM  
Clamp

SFM Slider

Attachment

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Basic Wind Speed (mph) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------|------------------------|-----------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                        |                        |                       | 90                     |     |     |     |     |     | 95  |     |     | 100 |     |     | 105 |     |     | 110 |     |     | 115 |     |     | 120 |     |     | 130 |     |     | 140 |     |     | 150 |    |    | 160 |    |    | 170 |    |    | 180 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        |                       | Roof Wind Zone         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        |                       | 1                      | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0                      | B                      | 0-7                   | 138                    | 138 | 138 | 138 | 138 | 127 | 138 | 138 | 116 | 138 | 133 | 109 | 138 | 124 | 102 | 138 | 117 | 96  | 138 | 111 | 91  | 129 | 101 | 82  | 119 | 92  | 75  | 110 | 85  | 68  | 102 | 79 | 63 | 96  | 73 | 59 | 90  | 69 | 50 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 138                    | 138 | 118 | 138 | 138 | 111 | 138 | 138 | 105 | 138 | 131 | 99  | 138 | 123 | 94  | 138 | 116 | 89  | 138 | 111 | 85  | 137 | 101 | 78  | 126 | 93  | 72  | 116 | 85  | 67  | 108 | 79 | 62 | 101 | 74 | 58 | 95  | 70 | 51 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 140                    | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 137 | 135 | 135 | 132 | 129 | 129 | 123 | 117 | 117 | 115 | 108 | 108 | 100 | 100 | 102 | 93 | 93 | 96  | 87 | 87 | 91  | 82 | 82 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | C                      | 0-7                   | 138                    | 130 | 107 | 138 | 120 | 99  | 138 | 113 | 93  | 136 | 106 | 87  | 129 | 101 | 82  | 123 | 95  | 77  | 117 | 91  | 73  | 107 | 82  | 66  | 98  | 76  | 61  | 91  | 70  | 52  | 85  | 65 | 43 | 80  | 60 | 36 | 75  | 55 | 32 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 138                    | 128 | 97  | 138 | 119 | 92  | 138 | 112 | 87  | 138 | 106 | 82  | 137 | 101 | 78  | 130 | 96  | 74  | 124 | 91  | 71  | 113 | 83  | 65  | 104 | 76  | 60  | 97  | 71  | 52  | 90  | 66 | 45 | 84  | 61 | 39 | 79  | 57 | 35 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 140                    | 140 | 140 | 139 | 139 | 139 | 133 | 131 | 131 | 128 | 123 | 123 | 117 | 117 | 118 | 111 | 111 | 113 | 106 | 106 | 105 | 97  | 97  | 97  | 98  | 90  | 90  | 92  | 83  | 83  | 86  | 78 | 78 | 81  | 73 | 73 | 76  | 68 | 68 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| D                      | 0-7                    | 138                   | 116                    | 95  | 138 | 108 | 89  | 131 | 102 | 83  | 124 | 96  | 78  | 117 | 91  | 74  | 111 | 86  | 70  | 106 | 82  | 66  | 97  | 75  | 60  | 90  | 69  | 50  | 83  | 63  | 41  | 78  | 59  | 34 | 73 | 51  | 30 | 68 | 44  | 27 |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | 7-27                   | 138                   | 115                    | 89  | 138 | 108 | 83  | 138 | 102 | 79  | 131 | 96  | 75  | 124 | 91  | 71  | 118 | 87  | 68  | 113 | 83  | 64  | 103 | 75  | 59  | 95  | 69  | 51  | 88  | 64  | 43  | 82  | 60  | 37 | 77 | 53  | 33 | 72 | 47  | 29 |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | 27-45                  | 136                   | 134                    | 134 | 130 | 126 | 126 | 124 | 118 | 119 | 112 | 112 | 114 | 106 | 106 | 109 | 101 | 101 | 105 | 97  | 97  | 98  | 89  | 89  | 91  | 82  | 82  | 84  | 76  | 76  | 73  | 74  | 66  | 66 | 69 | 62  | 62 |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                     | B                      | 0-7                   | 115                    | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 96  | 115 | 111 | 91  | 115 | 101 | 82  | 115 | 92  | 75  | 110 | 85  | 68  | 102 | 79  | 63 | 96 | 73  | 59 | 90 | 69  | 50 |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 116                    | 116 | 116 | 116 | 116 | 111 | 116 | 116 | 105 | 116 | 116 | 99  | 116 | 116 | 94  | 116 | 116 | 89  | 116 | 111 | 85  | 116 | 101 | 78  | 116 | 93  | 72  | 116 | 85  | 67  | 108 | 79 | 62 | 101 | 74 | 58 | 95  | 70 | 51 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 138                    | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 135 | 135 | 132 | 129 | 129 | 123 | 117 | 117 | 115 | 108 | 108 | 100 | 100 | 102 | 93  | 93 | 96 | 87  | 87 | 91 | 82  | 82 |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | C                      | 0-7                   | 115                    | 115 | 107 | 115 | 115 | 99  | 115 | 113 | 93  | 115 | 106 | 87  | 115 | 101 | 82  | 115 | 95  | 77  | 115 | 91  | 73  | 107 | 82  | 66  | 98  | 76  | 61  | 91  | 70  | 52  | 85  | 65 | 43 | 80  | 60 | 36 | 75  | 55 | 32 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 116                    | 116 | 97  | 116 | 116 | 92  | 116 | 112 | 87  | 116 | 106 | 82  | 116 | 101 | 78  | 116 | 96  | 74  | 116 | 91  | 71  | 113 | 83  | 65  | 104 | 76  | 60  | 97  | 71  | 52  | 90  | 66 | 45 | 84  | 61 | 39 | 79  | 57 | 35 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 138                    | 138 | 138 | 137 | 137 | 137 | 133 | 131 | 131 | 128 | 123 | 123 | 123 | 117 | 117 | 118 | 111 | 111 | 113 | 106 | 106 | 105 | 97  | 97  | 97  | 98  | 90  | 90  | 92  | 83  | 83  | 86 | 78 | 78  | 81 | 73 | 73  | 76 | 68 | 68  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| D                      | 0-7                    | 115                   | 115                    | 95  | 115 | 108 | 89  | 115 | 102 | 83  | 115 | 96  | 78  | 115 | 91  | 74  | 111 | 86  | 70  | 106 | 82  | 66  | 97  | 75  | 60  | 90  | 69  | 50  | 83  | 63  | 41  | 78  | 59  | 34 | 73 | 51  | 30 | 68 | 44  | 27 |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | 7-27                   | 116                   | 115                    | 89  | 116 | 108 | 83  | 116 | 102 | 79  | 116 | 96  | 75  | 116 | 91  | 71  | 116 | 87  | 68  | 113 | 83  | 64  | 103 | 75  | 59  | 95  | 69  | 51  | 88  | 64  | 43  | 82  | 60  | 37 | 77 | 53  | 33 | 72 | 47  | 29 |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | 27-45                  | 136                   | 134                    | 134 | 130 | 126 | 126 | 124 | 118 | 118 | 119 | 112 | 112 | 114 | 106 | 106 | 109 | 101 | 101 | 105 | 97  | 97  | 98  | 89  | 89  | 91  | 82  | 82  | 84  | 76  | 76  | 79  | 71  | 74 | 66 | 66  | 69 | 62 | 62  |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 20                     | B                      | 0-7                   | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96 | 96 | 96  | 96 | 96 | 96  | 96 | 96 | 96  | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |



ASCE 7-10  
Design Standard

II  
Risk Category

30 ft  
Roof Height

Ss = 3.00  
Seismic

18.66 sq.ft  
Module Area

LANDSCAPE  
Orientation

CROSS-SLOPE  
Rail Direction

Micro Rail  
Rail Type

SFM  
Clamp

SFM Slider  
Attachment

# SPAN TABLES

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

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Basic Wind Speed (mph) |    |    |    |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------|------------------------|-----------------------|------------------------|----|----|----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                        |                        |                       | 90                     |    |    | 95 |    |    | 100 |    |    | 105 |    |    | 110 |    |    | 115 |    |    | 120 |    |    | 130 |    |    | 140 |    |    | 150 |    |    | 160 |    |    | 170 |    |    | 180 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        |                       | Roof Wind Zone         |    |    |    |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        |                       | 1                      | 2  | 3  | 1  | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  | 1   | 2  | 3  |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 60                     | B                      | 0-7                   | 72                     | 72 | 72 | 72 | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 68  | 72 | 72 | 63  | 72 | 72 | 59  | 72 | 69 | 50  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 75                     | 75 | 75 | 75 | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 67  | 75 | 75 | 62  | 75 | 74 | 58  | 75 | 70 | 51  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 94                     | 94 | 94 | 94 | 94 | 94 | 94  | 94 | 94 | 94  | 94 | 94 | 94  | 94 | 93 | 93  | 93 | 92 | 92  | 92 | 89 | 89  | 89 | 87 | 87  | 87 | 84 | 84  | 82 | 82 | 80  | 80 | 80 | 78  | 78 | 78 |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | C                      | 0-7                   | 72                     | 72 | 72 | 72 | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 72 | 72 | 72  | 66 | 72 | 72  | 61 | 72 | 70  | 52 | 72 | 65  | 43 | 72 | 60  | 36 | 72 | 55  | 32 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 7-27                  | 75                     | 75 | 75 | 75 | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 74  | 75 | 75 | 74  | 75 | 75 | 75  | 75 | 65 | 75  | 65 | 60 | 75  | 71 | 52 | 74  | 66 | 45 | 72  | 61 | 39 | 71  | 57 | 35 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        |                        | 27-45                 | 94                     | 94 | 94 | 93 | 93 | 93 | 92  | 92 | 92 | 91  | 91 | 91 | 89  | 89 | 88 | 88  | 88 | 86 | 86  | 86 | 84 | 84  | 84 | 81 | 81  | 81 | 78 | 78  | 78 | 76 | 76  | 76 | 73 | 73  | 73 | 71 | 68  | 68 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| D                      | 0-7                    | 75                    | 75                     | 75 | 75 | 75 | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 75 | 75  | 75 | 74 | 75  | 75 | 70 | 75  | 66 | 75 | 60  | 75 | 69 | 50  | 75 | 63 | 41  | 75 | 59 | 34  | 73 | 51 | 30  | 68 | 44 | 27  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | 7-27                   | 78                    | 78                     | 78 | 78 | 78 | 78 | 78 | 78  | 78 | 78 | 78  | 78 | 78 | 78  | 78 | 78 | 78  | 78 | 78 | 78  | 78 | 78 | 75  | 59 | 77 | 69  | 51 | 76 | 64  | 43 | 75 | 60  | 37 | 73 | 53  | 33 | 72 | 47  | 29 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                        | 27-45                  | 96                    | 96                     | 96 | 94 | 94 | 94 | 92 | 92  | 92 | 91 | 91  | 91 | 89 | 89  | 89 | 87 | 87  | 87 | 86 | 86  | 86 | 82 | 82  | 82 | 79 | 79  | 79 | 76 | 76  | 76 | 73 | 71  | 71 | 66 | 66  | 68 | 62 | 62  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 70                     | B                      | 0-7                   | 67                     | 67 | 67 | 67 | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67  | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 |



30 ft  
Roof Height

**Ss = 3.00**  
Seismic

22.78 sq.ft

Module Area

## ORIENTATION

**CROSS-SLOPE**  
Rail Direction

Micro Rail

SFM

Clamp

SFM Slider

[illegible]



30 ft  
Roof Height

**Ss = 3.00**  
Seismic

22.78 sq.ft

## Portrait

**CROSS-SLOPE**  
Rail Direction

Micro Rail

SFM

Clamp

SFM Slider

# SPAN TABLES

[illegible]



| Category |
|----------|
| II       |

30 ft  
Roof Height

**S<sub>s</sub> = 3.00**  
Seismic

22.78 sq.ft  
Module Area

## LANDSCAPE

**CROSS-SLOPE**  
Rail Direction

Micro Rail

SFM  
Clamp

SFM Slider  
Attachment

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

| Ground Snow Load (psf) | Wind Exposure Category | Roof Tilt Angle (deg) | Basic Wind Speed (mph) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |     |    |    |    |    |
|------------------------|------------------------|-----------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|----|----|----|----|
|                        |                        |                       | 90                     |     |     | 95  |     |     | 100 |     |     | 105 |     |     | 110 |     |     | 115 |     |     | 120 |     |     | 130 |     |     | 140 |     |     | 150 |     |     | 160 |     |     | 170 |    |    | 180 |    |    |    |    |
|                        |                        |                       | Roof Wind Zone         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |     |    |    |    |    |
|                        |                        |                       | 1                      | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2   | 3   | 1   | 2  | 3  |     |    |    |    |    |
| 0                      | B                      | 0-7                   | 136                    | 136 | 136 | 136 | 136 | 125 | 136 | 136 | 115 | 136 | 131 | 108 | 136 | 123 | 101 | 136 | 116 | 95  | 136 | 110 | 90  | 128 | 100 | 81  | 117 | 91  | 74  | 109 | 84  | 68  | 101 | 78  | 63  | 95  | 73 | 58 | 89  | 68 | 49 |    |    |
|                        |                        | 7-27                  | 136                    | 136 | 117 | 136 | 136 | 110 | 136 | 136 | 104 | 136 | 129 | 98  | 136 | 122 | 93  | 136 | 115 | 88  | 136 | 110 | 84  | 136 | 100 | 77  | 125 | 92  | 71  | 115 | 85  | 66  | 107 | 79  | 61  | 100 | 73 | 57 | 94  | 69 | 50 |    |    |
|                        |                        | 27-45                 | 138                    | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 135 | 134 | 134 | 130 | 127 | 127 | 121 | 116 | 116 | 114 | 107 | 107 | 107 | 99  | 99  | 101 | 92  | 92  | 95  | 86 | 86 | 90  | 81 | 81 |    |    |
|                        | C                      | 0-7                   | 136                    | 129 | 106 | 136 | 119 | 98  | 136 | 112 | 92  | 135 | 105 | 86  | 128 | 100 | 81  | 121 | 94  | 77  | 116 | 90  | 73  | 106 | 82  | 66  | 97  | 75  | 60  | 90  | 69  | 51  | 84  | 64  | 42  | 79  | 60 | 35 | 74  | 53 | 31 |    |    |
|                        |                        | 7-27                  | 136                    | 127 | 96  | 136 | 118 | 91  | 136 | 111 | 86  | 136 | 105 | 81  | 136 | 100 | 77  | 129 | 95  | 73  | 122 | 90  | 70  | 112 | 82  | 64  | 103 | 76  | 59  | 95  | 70  | 51  | 89  | 65  | 44  | 83  | 61 | 38 | 78  | 56 | 34 |    |    |
|                        |                        | 27-45                 | 138                    | 138 | 138 | 138 | 137 | 137 | 132 | 129 | 129 | 126 | 122 | 122 | 121 | 116 | 116 | 117 | 110 | 110 | 112 | 105 | 105 | 104 | 96  | 96  | 97  | 89  | 89  | 91  | 82  | 82  | 85  | 77  | 77  | 80  | 72 | 72 | 75  | 68 | 68 |    |    |
| 10                     | D                      | 0-7                   | 136                    | 115 | 94  | 136 | 107 | 88  | 129 | 101 | 82  | 122 | 95  | 77  | 116 | 90  | 73  | 110 | 85  | 69  | 105 | 81  | 65  | 96  | 74  | 59  | 89  | 68  | 49  | 82  | 63  | 40  | 77  | 58  | 34  | 72  | 50 | 30 | 68  | 43 | 26 |    |    |
|                        |                        | 7-27                  | 136                    | 114 | 88  | 136 | 107 | 83  | 136 | 101 | 78  | 130 | 95  | 74  | 123 | 90  | 70  | 117 | 86  | 67  | 111 | 82  | 64  | 102 | 75  | 58  | 94  | 69  | 49  | 87  | 64  | 42  | 81  | 59  | 36  | 76  | 52 | 32 | 72  | 46 | 28 |    |    |
|                        |                        | 27-45                 | 134                    | 132 | 132 | 128 | 124 | 124 | 122 | 117 | 117 | 111 | 111 | 112 | 105 | 108 | 100 | 100 | 104 | 96  | 96  | 96  | 88  | 88  | 90  | 81  | 81  | 83  | 75  | 75  | 78  | 70  | 70  | 73  | 66  | 66  | 68 | 62 | 62  |    |    |    |    |
|                        | B                      | 0-7                   | 114                    | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 108 | 114 | 114 | 101 | 114 | 114 | 100 | 114 | 95  | 114 | 110 | 90  | 114 | 100 | 81  | 114 | 91  | 74  | 109 | 84  | 68  | 101 | 78  | 63 | 95 | 73  | 58 | 89 | 68 | 49 |
|                        |                        | 7-27                  | 115                    | 115 | 115 | 115 | 115 | 110 | 115 | 115 | 104 | 115 | 115 | 98  | 115 | 115 | 93  | 115 | 115 | 93  | 115 | 115 | 88  | 115 | 100 | 77  | 115 | 92  | 71  | 115 | 85  | 66  | 107 | 79  | 61  | 100 | 73 | 57 | 94  | 69 | 50 |    |    |
|                        |                        | 27-45                 | 136                    | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 134 | 134 | 134 | 130 | 127 | 127 | 121 | 116 | 116 | 114 | 107 | 107 | 107 | 99  | 99  | 101 | 92  | 92  | 95 | 86 | 86  | 90 | 81 | 81 |    |
| 20                     | C                      | 0-7                   | 114                    | 114 | 106 | 114 | 114 | 98  | 114 | 112 | 92  | 114 | 105 | 86  | 114 | 100 | 81  | 114 | 94  | 77  | 114 | 90  | 73  | 106 | 82  | 66  | 97  | 75  | 60  | 90  | 69  | 51  | 84  | 64  | 42  | 79  | 60 | 35 | 74  | 53 | 31 |    |    |
|                        |                        | 7-27                  | 115                    | 115 | 96  | 115 | 115 | 91  | 115 | 111 | 86  | 115 | 105 | 81  | 115 | 100 | 77  | 115 | 95  | 73  | 115 | 90  | 70  | 112 | 82  | 64  | 103 | 76  | 59  | 95  | 70  | 51  | 89  | 65  | 44  | 83  | 61 | 38 | 78  | 56 | 34 |    |    |
|                        |                        | 27-45                 | 136                    | 136 | 136 | 136 | 136 | 136 | 131 | 129 | 129 | 126 | 122 | 122 | 121 | 116 | 116 | 117 | 110 | 110 | 112 | 105 | 105 | 104 | 96  | 96  | 97  | 89  | 89  | 91  | 82  | 82  | 85  | 77  | 77  | 80  | 72 | 72 | 75  | 68 | 68 |    |    |
|                        | D                      | 0-7                   | 114                    | 114 | 94  | 114 | 107 | 88  | 114 | 101 | 82  | 114 | 95  | 77  | 114 | 90  | 73  | 110 | 85  | 69  | 105 | 81  | 65  | 96  | 74  | 59  | 89  | 68  | 49  | 82  | 63  | 40  | 77  | 58  | 34  | 72  | 50 | 30 | 68  | 43 | 26 |    |    |
|                        |                        | 7-27                  | 115                    | 114 | 88  | 115 | 107 | 83  | 115 | 101 | 78  | 115 | 95  | 74  | 115 | 90  | 70  | 115 | 86  | 67  | 111 | 82  | 64  | 102 | 75  | 58  | 94  | 69  | 49  | 87  | 64  | 42  | 81  | 59  | 36  | 76  | 52 | 32 | 72  | 46 | 28 |    |    |
|                        |                        | 27-45                 | 134                    | 132 | 132 | 128 | 124 | 124 | 122 | 117 | 117 | 111 | 111 | 112 | 105 | 108 | 100 | 100 | 104 | 96  | 96  | 96  | 88  | 88  | 90  | 81  | 81  | 83  | 75  | 75  | 78  | 70  | 70  | 73  | 66  | 66  | 68 | 62 | 62  |    |    |    |    |
| 30                     | B                      | 0-7                   | 95                     | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 91  | 74  | 95  | 84  | 68  | 95  | 78  | 63  | 95  | 73  | 58 | 89 | 68  | 49 |    |    |    |
|                        |                        | 7-27                  | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 88  | 96  | 86  | 96  | 96  | 96  | 97  | 96  | 92  | 71  | 96  | 85  | 66  | 96  | 79  | 61  | 94  | 73  | 57 | 92 | 69  | 50 |    |    |    |
|                        |                        | 27-45                 | 123                    | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 123 | 121 | 121 | 118 | 118 | 113 | 113 | 113 | 113 | 113 | 108 | 107 | 107 | 104 | 99  | 99  | 92  | 92  | 95  | 86  | 86 | 90 | 81  | 81 |    |    |    |
|                        | C                      | 0-7                   | 95                     | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 95  | 91  | 74  | 95  | 84  | 68  | 95  | 78  | 63  | 95  | 73 | 58 | 89  | 68 | 49 |    |    |
|                        |                        | 7-27                  | 96                     | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 96  | 88  | 96  | 86  | 96  | 96  | 96  | 97  | 96  | 92  | 71  | 96  | 85  | 66  | 96  | 79  | 61  | 94  | 73 | 57 | 92  | 69 | 50 |    |    |
|                        |                        | 27-45                 | 123                    | 123 | 123 | 123 | 122 | 122 | 122 | 122 | 119 | 119 | 119 | 116 | 116 | 113 | 113 | 113 | 110 | 110 | 107 | 107 | 105 | 105 | 102 | 96  | 96  | 97  | 89  | 89  | 91  | 82  | 82  | 85  | 77  | 77  | 80 | 72 | 72  | 75 | 68 | 68 |    |
| 40                     | D                      | 0-7                   | 95                     | 95  | 94  | 95  | 95  | 88  | 95  | 95  | 82  | 95  | 95  | 77  | 95  | 90  | 73  | 95  | 85  | 69  | 95  | 81  | 65  | 95  | 74  | 59  | 89  | 68  | 49  | 82  | 63  | 40  | 77  | 58  | 34  | 72  | 50 | 30 | 68  | 43 | 26 |    |    |
|                        |                        | 7-27                  | 96                     | 96  | 88  | 96  | 96  | 83  | 96  | 96  | 78  | 96  | 95  | 74  | 96  | 90  | 70  | 96  | 86  | 67  | 96  | 82  | 64  | 94  | 75  | 58  | 92  | 69  | 49  | 87  | 64  | 42  | 81  | 59  | 36  | 76  | 52 | 32 | 72  | 46 | 28 |    |    |
|                        |                        | 27-45                 | 113                    | 113 | 113 | 110 | 110 | 110 | 108 | 108 | 108 | 105 | 105 | 105 | 102 | 102 | 102 | 100 | 100 | 100 | 97  | 96  | 96  | 93  | 88  | 88  | 88  | 81  | 81  | 83  | 75  | 75  | 78  | 70  | 70  | 73  | 66 | 66 | 68  | 62 | 62 |    |    |
|                        | B                      | 0-7                   | 85                     | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 81  | 85  | 84  | 68  | 85  | 78  | 63  | 85  | 73 | 58 | 85  | 68 | 49 |    |    |
|                        |                        | 7-27                  | 88                     | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88 | 88 | 88  | 88 | 88 | 88 |    |
|                        |                        | 27-45                 | 105                    | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 103 | 103 | 103 | 102 | 102 | 102 | 102 | 98  | 98  | 98  | 95  | 95  | 95  | 92  | 92  | 92  | 89  | 89  | 89  | 86 | 86 | 83  | 81 | 81 |    |    |
| 50                     | C                      | 0-7                   | 85                     | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85  | 85 | 85 | 85  | 85 | 85 |    |    |
|                        |                        | 7-27                  | 88                     | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88  | 88 | 88 | 88  | 88 | 88 | 88 |    |
|                        |                        | 27-45                 | 105                    | 105 | 105 | 104 | 104 | 104 | 102 | 102 | 100 | 100 | 100 | 98  | 98  | 98  | 98  | 96  | 96  | 94  | 94  | 93  | 93  | 93  | 91  | 91  | 91  | 90  | 90  | 90  | 86  | 86  | 86  | 83  | 83  | 80  | 80 | 77 | 77  | 75 | 68 | 68 |    |
|                        | D                      | 0-7                   | 81                     | 81  | 81  | 81  | 81  | 81  | 81  | 81  | 81  | 81  | 81  | 81  | 77  | 81  | 81  | 73  | 81  | 81  | 69  | 81  | 81  | 65  | 81  | 74  | 59  | 81  | 68  | 49  | 81  | 63  | 40  | 77  | 58  | 34  | 72 | 50 | 30  | 68 | 43 | 26 |    |
|                        |                        | 7-27                  | 84                     | 84  | 84  | 84  | 84  | 83  | 84  | 84  | 78  | 84  | 84  | 74  | 84  | 84  | 70  | 84  | 84  | 67  | 84  | 82  | 64  | 83  | 75  | 58  | 82  | 69  | 49  | 80  | 64  | 42  | 78  | 59  | 36  | 76  | 52 | 32 | 72  | 46 | 28 |    |    |
|                        |                        | 27-45                 | 100                    | 100 | 100 | 98  | 98  | 98  | 98  | 96  | 96  | 94  | 94  | 94  | 92  | 92  | 92  | 90  | 90  | 90  | 88  | 88  | 88  | 85  | 85  | 85  | 81  | 81  | 81  | 78  | 75  | 75  | 70  | 70  | 72  | 66  | 66 | 68 | 62  | 62 |    |    |    |

