



March 22, 2023

Mr. Ryan Estrada
K2 Systems LLC
4665 North Avenue, Suite I
Oceanside, CA 92056

Re: PV Tilt Up Rack System
Creation of Span Tables
Various Locations in the USA

LEI Project No: 21220004.002

Dear Mr. Estrada:

Pursuant to your request, Larson Engineering, Inc. (LEI) has performed a structural analysis of the K2 CrossRail Tilt Up System using the rail type: 44-X, 48-X, 48-XL and 80 for a panel size of 43.2 inches x 80 inches in Portrait orientation. The purpose of the analysis was to provide tables for the maximum spans and reactions to the roof under various loading conditions.

The analysis was performed in accordance with the following codes and guidelines:

- *ASCE 7-16 Minimum Design Loads for Buildings and Other Structures*, referenced by the International Building Code 2018 and 2021 editions and the International Residential Code 2018 and 2021 editions, 2019 California Building Standards Code and 2022 California Building Standards Code,
- *2015 Aluminum Design Manual* and the *2020 Aluminum Design Manual* by the Aluminum Association,
- *Wind Design for Low-Profile Solar Photovoltaic Arrays on Flat Roofs Report SEAOC PV2-2012* dated August 2012 by the Structural Engineers Association of California (SEAOC), portions of this are referenced in ASCE 7-16, chapter 29.

The rail system used 6000 series aluminum alloy with a minimum yield strength of 34.8ksi. Section properties for each rail system was provided by K2 Systems, LLC.

DESCRIPTION

The K2 CrossRail Tilt Up System consists of extruded aluminum PV support rails that span between an L-shaped support consisting of two (2) members, the front leg and the rear leg, whose lengths can be adjusted as required to vary the tilt angle of the panels. The front and rear legs are constructed of the same type of rail as the PV support rails. They are connected to one another using plates with screws to form a 90 degree triangle and each leg is attached to the roof using an L-foot. The PV support rails connect to the front leg with angle attachments. The PV panels connect to the PV support rails using a clamp. Attachment of the Tilt Up System to the existing roof shall be the responsibility of the installer and is required to be analyzed by a registered professional or structural engineer.

THIS SECTION INTENTIONALLY LEFT BLANK

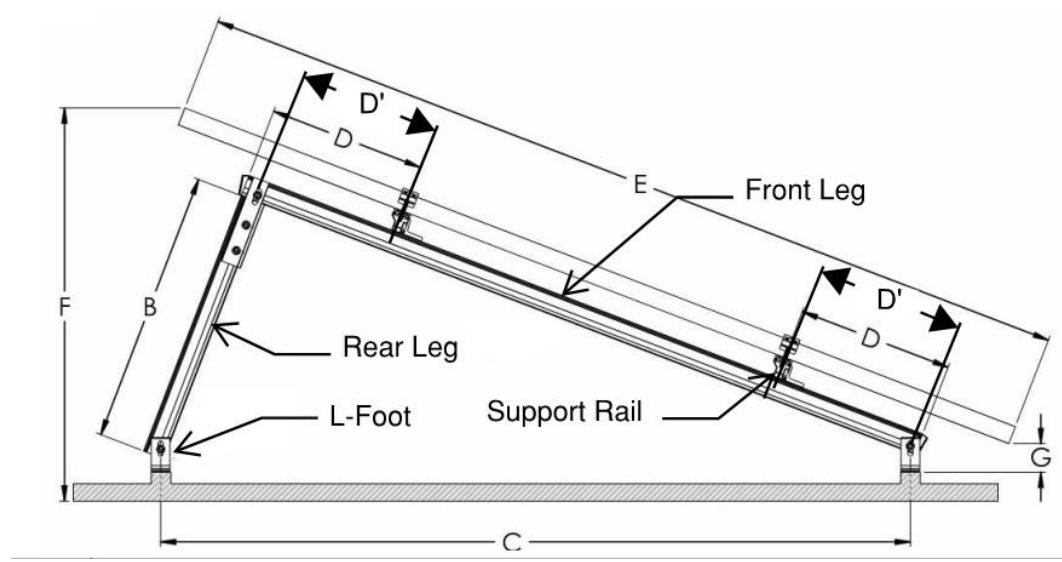


Figure 1 Typical Configuration (refer to K2 CrossRail Tilt Up System Assembly Instructions)

METHODS AND DESIGN PARAMETERS

Load combinations were provided in accordance with the ASCE 7-16 guidelines based on the assumption that the rail is a single span condition or multi-span condition and using an allowable deflection of 1/120. Wind pressure was determined in accordance with ASCE 7-16 chapter 26 and ASCE 7-16 section 29.4.3 “Rooftop Solar Panels for Buildings of all Heights with Flat Roofs or Gable or Hip Roofs with slopes less than 7°” whose tilt angles are less than 35°.

The snow loads indicated in the tables are based on a flat roof snow load. The snow load applied to the system may be adjusted with the tilt angle in accordance with sloped roof snow loads. The appropriate ground snow loads should be determined in accordance with the ground snow load maps in ASCE 7-16 or per the local building code.

The following table shows the equivalent ground snow value associated with the flat snow load shown in the span and reaction tables assuming $C_t=1.0$, $C_e=1.0$, $I=1.0$.

Determine Equivalent Ground Snow for indicated flat snow (psf)

| P _f , flat snow (psf) | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
|------------------------------------|------|------|------|------|------|------|-----|
| P _g , ground snow (psf) | 14.3 | 28.5 | 42.8 | 57.2 | 71.4 | 85.7 | 100 |

Seismic criteria were considered per the provisions of ASCE 7-16, chapter 13. Seismic effects did not govern the capacity of this system.

THIS SECTION INTENTIONALLY LEFT BLANK

The following design parameters were used for the purpose of this analysis:

| <u>General</u> | <u>Wind</u> | <u>Snow</u> | <u>Seismic</u> |
|--------------------------------------|--------------------------|--------------------------|----------------------|
| Risk Category: II | V, ult: 90 - 180 mph | Flat snow pf: 0 - 70 psf | Site Class: D |
| Roof Mean Height: <= 30 ft | Exposures: B, C & D | Ce: 1.0 | Design Category: A-E |
| Roof Slope: 0° to 7 ° | Pressure Zones: 1, 2 & 3 | Ct: 1.0 | Ss:<=2.0 |
| Panel Slope: 7° to 25° (from ground) | | Cs: Varies | S1:<=1.25 |
| Panel Orientation: See Charts | | Is: 1.0 | Ip: 1.0 |
| Panel Size: See Charts | | | ap: 1.0 |
| | | | Rp: 1.5 |

DESIGN RESULTS

The allowable span lengths of the system are controlled by applicable wind and snow load combinations. The reaction loads provided in the tables are only applicable to the corresponding span lengths provided. Reaction loads shown are based on the worst case of the front and rear mounting brackets. Reactions may be scaled linearly where shorter spans are used. The reactions shown for Multi Span assumes an interior support location. The maximum span length may be limited due to the capacity of the support rail, the capacity of the front leg to resist the reaction load from the support rail, or the capacity of the L-foot connection.

The following tables are provided for each exposure category, B, C & D for Interior and Edge Multi-Span Conditions in the **Portrait** Orientation:

Maximum Span Length (Inches) Multi Span Only, Tables 1.1, 1.1A, 2.1, 2.1A, 3.1, 3.1A
 Maximum Downward Force (lbs) Multi Span Only, Tables 1.2, 1.2A, 2.2, 2.2A, 3.2, 3.2A
 Maximum Horizontal Force (lbs) Multi Span Only, Tables 1.3, 1.3A, 2.3, 2.3A, 3.3, 3.3A
 Maximum Uplift Force (lbs) Multi Span Only. Tables 1.4, 1.4A, 2.4, 2.4A, 3.4, 3.4A
 Maximum Span Length (Inches) Single Span Only, Tables 1.5, 1.5A, 2.5, 2.5A, 3.5, 3.5A
 Maximum Downward Force (lbs) Single Span Only, Tables 1.6, 1.6A, 2.6, 2.6A, 3.6, 3.6A
 Maximum Horizontal Force (lbs) Single Span Only, Tables 1.7, 1.7A, 2.7, 2.7A, 3.7, 3.7A
 Maximum Uplift Force (lbs) Single Span Only. Tables 1.8, 1.8A, 2.8, 2.8A, 3.8, 3.8A

Figures 2 & 3 define the roof zones per ASCE 7-16 Figure 29.4-1 and are referenced in the attached Tables for Interior and Edge Conditions. Figure 4 defines the array edge factors used for wind uplift. The Edge Condition tables should be applied to the north and south rows and to the spans that occur within 1.5 panel lengths of the east and west edges as defined in Figure 4.

The following notations should be applied to Figures 2 through 4.

d1: Horizontal distance orthogonal to the panel edge to an adjacent panel or building edge.

d2: Horizontal distance orthogonal from the edge of one panel to the nearest edge in the next row.

h: Mean Roof Height.

WL=Width of a Building on its longest side.

Ws=Width of a Building on its shortest side.

Lp: Panel Length.

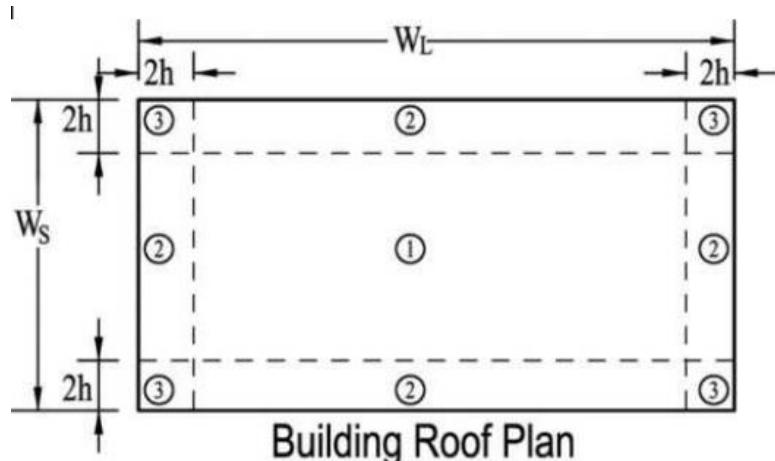


Figure 2. ASCE 7-16 Figure 29.4-7 shows the Building Roof Plan defining the roof zones.

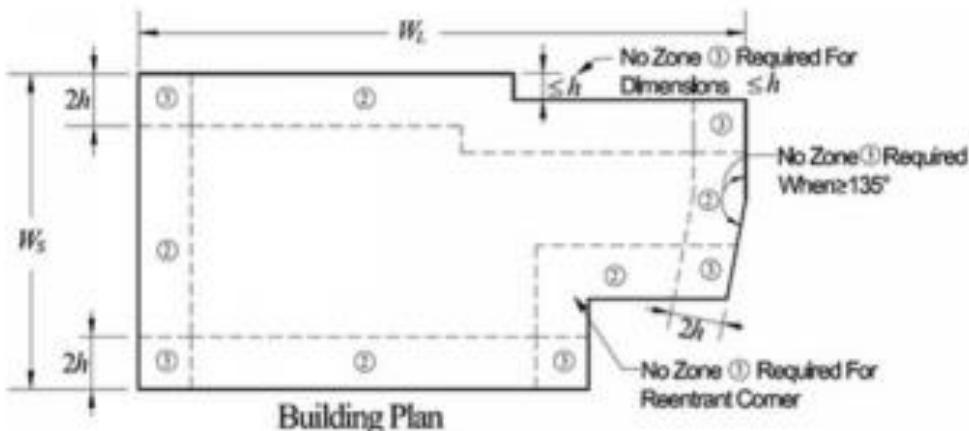


Figure 3. ASCE 7-16 Figure C29.4-1 shows a sketch of Building with Irregular Plan Dimensions

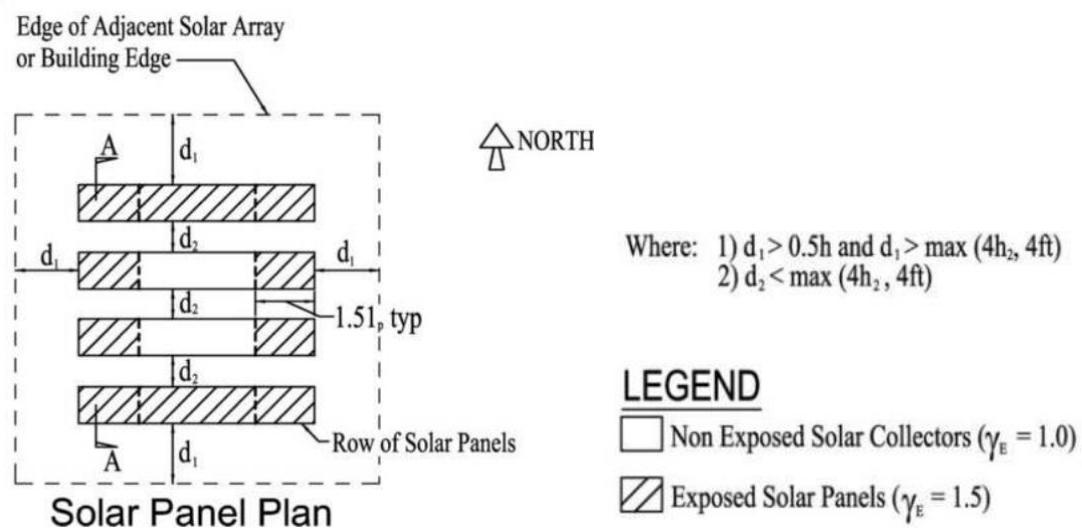


Figure 4. ASCE 7-16 Figure 29.4-7 Array Edge Factors

INSTALLATION & CONFIGURATION NOTES

The following guidelines apply to all installations using the K2 CrossRail Tilt Up System product line:

- Refer to Tilt Up Kit allowable geometry and installation guidelines by K2 Systems, LLC,
- All fasteners and connective hardware shall be installed per manufacturer specifications,
- The support rails shall be placed no further from the center of the L-Foot or Rear leg than 6", see dimension D' on Figure 1,
- This analysis is limited to installations south of any roof ridge, if present. On pitched roofs the northern most row of panels should be located between 3' and 12' from the ridge,
- Span tables assume (2) two independent horizontal support rails per panel. Rails shall be located no further than 8" from cut end of diagonal member (refer to Figure 1),
- High edge of panel not to exceed 30" from roof surface,
- Maximum end cantilever of horizontal support rail shall not exceed one-third (1/3) of allowable span in the roof wind pressure zone,
- Rails shall be continuous over a minimum of two (2) supports unless using an approved K2 Structural Splice,
- Installations over roof overhangs or within 12" of any roof edge is not advised,
- Observe all local jurisdictional requirements regarding roof setback requirements.

SUMMARY

This assessment has provided design validation for code compliant installations of the K2 CrossRail Tilt Up System in the state noted in the stamp below. Local jurisdictions shall be consulted for the proper code requirements. For the configurations and design loadings noted previously, the attached span tables represent maximum span lengths based on allowable stresses and deflection criteria. For all other configurations, refer to K2 Systems, LLC for engineering support.

This report does not provide analysis of any existing structures to support the loading imposed by the K2 CrossRail Tilt Up System, as may be required by the local authority having jurisdiction.

If you have any further questions regarding this matter, please feel free to contact our office.

Sincerely,
Larson Engineering, Inc.

Christine Wrobel
Christine A. Wrobel
Senior Project Manager – Structural
cwrobel@larsonengr.com

Amber Dell Angelo
Amber D. Dell Angelo, S.E.
Senior Project Manager-Structural
CA Structural License # 6402, Exp 6/30/24
adellangelo@larsonengr.com



CAW:ng

Attachments: Tables as indicated above



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.1 Max Length L (inches) for Multi Span only Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|----|----|----|----|----|---------------------------|-----|----|----|----|----|----|---------------------------|-----|-----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 |
| 90 | 44-X | 71 | 56 | 39 | 27 | 21 | 0 | 0 | 0 | 56 | 49 | 36 | 27 | 0 | 0 | 0 | 0 | 48 | 44 | 34 | 27 | 0 | 0 | 0 | 0 |
| | 48-X | 74 | 56 | 39 | 28 | 21 | 0 | 0 | 0 | 58 | 51 | 36 | 28 | 0 | 0 | 0 | 0 | 50 | 46 | 35 | 27 | 0 | 0 | 0 | 0 |
| | 48-XL | 152 | 115 | 79 | 56 | 43 | 35 | 29 | 25 | 119 | 104 | 74 | 56 | 43 | 35 | 29 | 25 | 103 | 94 | 71 | 55 | 43 | 35 | 29 | 25 |
| | 80 | 186 | 147 | 102 | 72 | 55 | 45 | 38 | 32 | 146 | 128 | 95 | 72 | 55 | 45 | 38 | 32 | 126 | 115 | 90 | 71 | 55 | 45 | 38 | 32 |
| | 44-X | 61 | 51 | 37 | 27 | 0 | 0 | 0 | 0 | 47 | 43 | 34 | 26 | 0 | 0 | 0 | 0 | 40 | 39 | 31 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 64 | 53 | 37 | 28 | 0 | 0 | 0 | 0 | 49 | 45 | 34 | 27 | 0 | 0 | 0 | 0 | 42 | 41 | 33 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 130 | 107 | 75 | 56 | 43 | 35 | 29 | 25 | 101 | 93 | 69 | 54 | 43 | 35 | 29 | 25 | 87 | 83 | 66 | 52 | 43 | 35 | 29 | 25 |
| | 80 | 160 | 135 | 97 | 72 | 55 | 45 | 38 | 32 | 124 | 114 | 89 | 69 | 55 | 45 | 38 | 32 | 106 | 102 | 82 | 67 | 55 | 45 | 38 | 32 |
| | 44-X | 53 | 47 | 35 | 27 | 0 | 0 | 0 | 0 | 40 | 39 | 31 | 0 | 0 | 0 | 0 | 0 | 34 | 34 | 28 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 55 | 49 | 35 | 27 | 0 | 0 | 0 | 0 | 42 | 41 | 32 | 0 | 0 | 0 | 0 | 0 | 36 | 35 | 30 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 113 | 99 | 72 | 55 | 43 | 35 | 29 | 25 | 87 | 83 | 65 | 51 | 42 | 35 | 29 | 25 | 74 | 72 | 60 | 49 | 41 | 35 | 29 | 25 |
| | 80 | 138 | 123 | 92 | 71 | 55 | 45 | 38 | 32 | 106 | 102 | 82 | 66 | 55 | 45 | 38 | 32 | 90 | 88 | 74 | 63 | 53 | 45 | 38 | 32 |
| | 44-X | 46 | 43 | 33 | 26 | 0 | 0 | 0 | 0 | 35 | 34 | 28 | 0 | 0 | 0 | 0 | 0 | 30 | 29 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 48 | 45 | 33 | 26 | 0 | 0 | 0 | 0 | 37 | 36 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 98 | 91 | 68 | 53 | 43 | 35 | 29 | 25 | 75 | 73 | 61 | 49 | 41 | 35 | 29 | 25 | 63 | 62 | 55 | 47 | 39 | 34 | 29 | 25 |
| | 80 | 120 | 112 | 87 | 68 | 55 | 45 | 38 | 32 | 92 | 89 | 75 | 63 | 52 | 45 | 38 | 32 | 78 | 76 | 67 | 58 | 50 | 43 | 38 | 32 |
| | 44-X | 40 | 39 | 31 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 42 | 41 | 32 | 0 | 0 | 0 | 0 | 0 | 32 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 86 | 83 | 64 | 51 | 42 | 35 | 29 | 25 | 65 | 64 | 56 | 46 | 39 | 33 | 29 | 25 | 55 | 54 | 50 | 43 | 37 | 32 | 28 | 25 |
| 110 | 80 | 105 | 102 | 81 | 65 | 54 | 45 | 38 | 32 | 80 | 78 | 68 | 59 | 50 | 43 | 38 | 32 | 67 | 66 | 61 | 53 | 47 | 41 | 37 | 32 |
| | 44-X | 35 | 35 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 37 | 36 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 76 | 74 | 61 | 49 | 40 | 35 | 29 | 25 | 57 | 56 | 51 | 44 | 37 | 32 | 28 | 25 | 48 | 47 | 46 | 40 | 35 | 31 | 27 | 25 |
| | 80 | 93 | 91 | 75 | 62 | 52 | 45 | 38 | 32 | 70 | 68 | 63 | 54 | 48 | 41 | 37 | 32 | 59 | 58 | 56 | 49 | 44 | 39 | 35 | 32 |
| | 44-X | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 33 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 67 | 66 | 57 | 46 | 39 | 34 | 29 | 25 | 50 | 50 | 47 | 41 | 35 | 31 | 27 | 25 | 42 | 41 | 37 | 33 | 29 | 26 | 0 | 0 |
| | 80 | 83 | 81 | 70 | 60 | 50 | 43 | 38 | 32 | 62 | 61 | 58 | 50 | 45 | 40 | 35 | 32 | 52 | 51 | 50 | 45 | 41 | 37 | 34 | 30 |
| 120 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 60 | 59 | 53 | 44 | 37 | 32 | 29 | 25 | 45 | 44 | 43 | 38 | 34 | 30 | 26 | 0 | 38 | 37 | 36 | 34 | 31 | 28 | 0 | 0 |
| | 80 | 74 | 72 | 65 | 56 | 48 | 42 | 37 | 32 | 55 | 54 | 53 | 47 | 42 | 38 | 34 | 31 | 46 | 46 | 45 | 42 | 38 | 35 | 32 | 29 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 54 | 53 | 49 | 42 | 36 | 31 | 28 | 25 | 40 | 40 | 39 | 36 | 32 | 28 | 0 | 0 | 34 | 33 | 33 | 32 | 29 | 0 | 0 | 0 |
| | 80 | 60 | 59 | 56 | 49 | 44 | 39 | 35 | 31 | 44 | 44 | 43 | 41 | 37 | 34 | 31 | 29 | 37 | 37 | 36 | 35 | 33 | 30 | 28 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-X | 39 | 38 | 37 | 35 | 33 | 31 | 30 | 28 | 33 | 33 | 32 | 32 | 30 | 29 | 28 | 27 | 30 | 30 | 30 | 29 | 29 | 27 | 27 | 26 |
| | 48-XL | 49 | 48 | 46 | 40 | 34 | 30 | 27 | 24 | 36 | 36 | 35 | 33 | 30 | 27 | 0 | 0 | 30 | 30 | 29 | 29 | 0 | 0 | 0 | 0 |
| | 80 | 60 | 59 | 56 | 49 | 44 | 39 | 35 | 31 | 44 | 44 | 43 | 41 | 37 | 34 | 31 | 29 | 37 | 37 | 36 | 35 | 33 | 30 | 28 | 0 |
| | 44-X | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 33 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 67 | 66 | 57 | 46 | 39 | 34 | 29 | 25 | 50 | 50 | 47 | 41 | 35 | 31 | 27 | 25 | 42 | 41 | 37 | 33 | 29 | 26 | 0 | 0 |
| | 80 | 83 | 81 | 70 | 60 | 50 | 43 | 38 | 32 | 62 | 61 | 58 | 50 | 45 | 40 | 35 | 32 | 52 | 51 | 50 | 45 | 41 | 37 | 34 | 30 |
| | 44-X | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 33 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 67 | 66 | 57 | 46 | 39 | 34 | 29 | 25 | 50 | 50 | 47 | 41 | 35 | 31 | 27 | 25 | 42 | 41 | 37 | 33 | 29 | 26 | 0 | 0 |
| | 80 | 83 | 81 | 70 | 60 | 50 | 43 | 38 | 32 | 62 | 61 | 58 | 50 | 45 | 40 | 35 | 32 | 52 | 51 | 50 | 45 | 41 | 37 | 34 | 30 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 67 | 66 | 57 | 46 | 39 | 34 | 29 | 25 | 50 | 50 | 47 | 41 | 35 | 31 | 27 | 25 | 42 | 41 | 37 | 33 | 29 | 26 | 0 | 0 |
| | 80 | 83 | 81 | 70 | 60 | 50 | 43 | 38 | 32 | 62 | 61 | 58 | 50 | 45 | 40 | 35 | 32 | 52 | 51 | 50 | 45 | 41 | 37 | 34 | 30 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 54 | 53 | 49 | 42 | 36 | 31 | 28 | 25 | 40 | 40 | 39 | 36 | 32 | 28 | 0 | 0 | 34 | 33 | 33 | 32 | 29 | 0 | 0 | 0 |
| 150 | 80 | 80 | 60 | 59 | 56 | 49 | 44 | 39 | 35 | 31 | 44 | 44 | 43 | 41 | | | | | | | | | | | |



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
Standard size 43.2"x 80" Portrait Orientation

Table 1.1A Max Length L (inches) for Multi Span only Exterior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|-----|----|----|----|----|----|---------------------------|-----|-----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 68 | 57 | 39 | 28 | 21 | 0 | 0 | 0 | 47 | 47 | 37 | 28 | 0 | 0 | 0 | 0 | 38 | 38 | 34 | 27 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 74 | 57 | 39 | 28 | 21 | 0 | 0 | 0 | 51 | 51 | 37 | 28 | 0 | 0 | 0 | 0 | 42 | 42 | 35 | 27 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 146 | 116 | 82 | 58 | 45 | 36 | 30 | 26 | 115 | 100 | 76 | 58 | 45 | 36 | 31 | 26 | 99 | 90 | 70 | 57 | 45 | 36 | 30 | 26 | |
| | 80 | 173 | 138 | 97 | 68 | 52 | 43 | 36 | 31 | 136 | 119 | 90 | 68 | 52 | 43 | 36 | 31 | 117 | 107 | 84 | 68 | 52 | 43 | 36 | 31 | |
| | 44-X | 53 | 51 | 37 | 28 | 0 | 0 | 0 | 0 | 37 | 37 | 34 | 27 | 0 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 59 | 53 | 37 | 28 | 0 | 0 | 0 | 0 | 41 | 41 | 35 | 27 | 0 | 0 | 0 | 0 | 33 | 33 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 125 | 106 | 78 | 58 | 45 | 36 | 30 | 26 | 97 | 89 | 70 | 56 | 45 | 36 | 31 | 26 | 83 | 80 | 64 | 53 | 45 | 36 | 30 | 26 | |
| | 80 | 149 | 126 | 92 | 68 | 52 | 43 | 36 | 31 | 115 | 106 | 83 | 66 | 52 | 43 | 36 | 31 | 99 | 95 | 76 | 63 | 52 | 43 | 36 | 31 | |
| | 44-X | 43 | 43 | 35 | 27 | 0 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 47 | 47 | 36 | 27 | 0 | 0 | 0 | 0 | 33 | 33 | 32 | 0 | 0 | 0 | 0 | 0 | 27 | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 108 | 96 | 74 | 58 | 45 | 36 | 30 | 26 | 83 | 80 | 64 | 53 | 44 | 36 | 31 | 26 | 71 | 69 | 58 | 49 | 42 | 36 | 30 | 26 | |
| | 80 | 128 | 114 | 88 | 68 | 52 | 43 | 36 | 31 | 99 | 95 | 76 | 63 | 52 | 43 | 36 | 31 | 82 | 82 | 69 | 58 | 50 | 43 | 36 | 31 | |
| | 44-X | 36 | 36 | 33 | 26 | 0 | 0 | 0 | 0 | 25 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-X | 39 | 39 | 34 | 26 | 0 | 0 | 0 | 0 | 27 | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 94 | 87 | 69 | 55 | 45 | 36 | 30 | 26 | 72 | 70 | 59 | 49 | 42 | 36 | 31 | 26 | 61 | 59 | 53 | 45 | 40 | 35 | 30 | 26 | |
| | 80 | 112 | 104 | 81 | 65 | 52 | 43 | 36 | 31 | 83 | 83 | 69 | 59 | 50 | 43 | 36 | 31 | 68 | 68 | 63 | 54 | 47 | 41 | 36 | 31 | |
| | 44-X | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-X | 42 | 41 | 32 | 0 | 0 | 0 | 0 | 0 | 32 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 83 | 80 | 64 | 53 | 44 | 36 | 30 | 26 | 62 | 61 | 54 | 46 | 40 | 35 | 31 | 26 | 51 | 51 | 48 | 42 | 37 | 33 | 30 | 26 | |
| | 80 | 98 | 95 | 76 | 62 | 51 | 43 | 36 | 31 | 70 | 70 | 64 | 54 | 48 | 41 | 36 | 31 | 57 | 57 | 57 | 49 | 44 | 39 | 35 | 31 | |
| | 44-X | 35 | 35 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-X | 28 | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 73 | 71 | 59 | 50 | 42 | 36 | 30 | 26 | 54 | 54 | 49 | 43 | 38 | 33 | 30 | 26 | 44 | 44 | 44 | 38 | 34 | 31 | 28 | 26 | |
| | 80 | 85 | 84 | 70 | 59 | 50 | 42 | 36 | 31 | 60 | 60 | 58 | 51 | 45 | 39 | 35 | 31 | 49 | 49 | 49 | 46 | 41 | 37 | 33 | 30 | |
| | 44-X | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-X | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 65 | 63 | 55 | 47 | 40 | 35 | 30 | 26 | 46 | 46 | 45 | 40 | 35 | 32 | 28 | 26 | 38 | 38 | 38 | 35 | 32 | 29 | 27 | 0 | |
| | 80 | 73 | 73 | 65 | 56 | 48 | 41 | 36 | 31 | 52 | 52 | 47 | 42 | 38 | 34 | 30 | 43 | 43 | 42 | 38 | 34 | 32 | 29 | 27 | | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 57 | 57 | 51 | 44 | 39 | 34 | 30 | 26 | 41 | 41 | 41 | 37 | 33 | 30 | 27 | 0 | 33 | 33 | 33 | 30 | 27 | 0 | 0 | 0 | |
| | 80 | 64 | 64 | 61 | 52 | 46 | 40 | 35 | 31 | 45 | 45 | 45 | 44 | 39 | 35 | 32 | 29 | 37 | 37 | 37 | 35 | 32 | 30 | 27 | | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 50 | 50 | 47 | 41 | 36 | 33 | 29 | 26 | 36 | 36 | 36 | 34 | 31 | 28 | 0 | 0 | 29 | 29 | 29 | 29 | 28 | 0 | 0 | 0 | |
| | 80 | 50 | 50 | 50 | 46 | 41 | 37 | 33 | 30 | 36 | 36 | 36 | 34 | 31 | 29 | 27 | 29 | 29 | 29 | 29 | 29 | 28 | 26 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 45 | 45 | 44 | 39 | 34 | 31 | 28 | 25 | 32 | 32 | 32 | 29 | 26 | 0 | 0 | 26 | 26 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 50 | 50 | 50 | 46 | 41 | 37 | 33 | 30 | 36 | 36 | 36 | 34 | 31 | 29 | 27 | 29 | 29 | 29 | 29 | 29 | 28 | 26 | 0 | 0 | |

Note: The Length is based on use of at least two spans. Cantilevered ends may be used that are no greater than 1/3 of the backspan.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.2 Maximum Downward Force (lbs) Multi Span Only Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | 218 | 243 | 248 | 249 | 249 | 0 | 0 | 0 | 219 | 235 | 249 | 249 | 0 | 0 | 0 | 0 | 220 | 226 | 247 | 250 | 0 | 0 | 0 | 0 | 0 | |
| | | 228 | 246 | 251 | 252 | 252 | 0 | 0 | 0 | 230 | 246 | 252 | 252 | 0 | 0 | 0 | 0 | 230 | 236 | 252 | 253 | 0 | 0 | 0 | 0 | 0 | |
| | | 467 | 498 | 509 | 511 | 512 | 512 | 512 | 512 | 470 | 501 | 511 | 511 | 512 | 512 | 514 | 512 | 471 | 484 | 511 | 513 | 512 | 512 | 512 | 512 | 512 | |
| | | 572 | 641 | 655 | 658 | 658 | 658 | 658 | 658 | 575 | 616 | 657 | 658 | 658 | 658 | 661 | 658 | 577 | 593 | 648 | 659 | 658 | 658 | 658 | 658 | 658 | |
| | | 572 | 641 | 655 | 658 | 658 | 658 | 658 | 658 | 575 | 616 | 657 | 658 | 658 | 658 | 661 | 658 | 577 | 593 | 648 | 659 | 658 | 658 | 658 | 658 | 658 | |
| 100 | 44-X | 219 | 241 | 249 | 249 | 0 | 0 | 0 | 0 | 220 | 230 | 249 | 249 | 0 | 0 | 0 | 0 | 221 | 224 | 241 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 229 | 247 | 251 | 252 | 0 | 0 | 0 | 0 | 230 | 240 | 252 | 252 | 0 | 0 | 0 | 0 | 231 | 235 | 252 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 469 | 500 | 510 | 511 | 512 | 512 | 512 | 512 | 471 | 491 | 511 | 510 | 512 | 512 | 514 | 512 | 473 | 480 | 512 | 513 | 511 | 512 | 512 | 512 | 512 | |
| | | 574 | 632 | 656 | 658 | 658 | 658 | 658 | 658 | 577 | 602 | 655 | 656 | 658 | 658 | 661 | 658 | 579 | 589 | 631 | 660 | 658 | 658 | 658 | 658 | 658 | |
| | | 574 | 632 | 656 | 658 | 658 | 658 | 658 | 658 | 577 | 602 | 655 | 656 | 658 | 658 | 661 | 658 | 579 | 589 | 631 | 660 | 658 | 658 | 658 | 658 | 658 | |
| 110 | 44-X | 220 | 236 | 249 | 248 | 0 | 0 | 0 | 0 | 221 | 225 | 244 | 0 | 0 | 0 | 0 | 0 | 221 | 218 | 235 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 230 | 247 | 252 | 251 | 0 | 0 | 0 | 0 | 231 | 235 | 253 | 0 | 0 | 0 | 0 | 0 | 232 | 228 | 246 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 470 | 179 | 212 | 238 | 263 | 292 | 318 | 343 | 198 | 193 | 225 | 250 | 272 | 293 | 319 | 343 | 216 | 211 | 230 | 258 | 279 | 299 | 318 | 343 | 343 | |
| | | 576 | 620 | 657 | 656 | 658 | 658 | 658 | 658 | 579 | 590 | 641 | 657 | 656 | 658 | 661 | 658 | 581 | 571 | 616 | 651 | 657 | 658 | 658 | 658 | 658 | |
| | | 576 | 620 | 657 | 656 | 658 | 658 | 658 | 658 | 579 | 590 | 641 | 657 | 656 | 658 | 661 | 658 | 582 | 569 | 602 | 637 | 658 | 657 | 658 | 658 | 658 | |
| 120 | 44-X | 220 | 232 | 249 | 249 | 0 | 0 | 0 | 0 | 221 | 218 | 239 | 0 | 0 | 0 | 0 | 0 | 222 | 217 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 230 | 243 | 252 | 252 | 0 | 0 | 0 | 0 | 232 | 228 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 472 | 498 | 512 | 511 | 512 | 512 | 512 | 512 | 474 | 467 | 512 | 512 | 511 | 512 | 514 | 512 | 475 | 464 | 492 | 515 | 511 | 510 | 512 | 512 | 512 | |
| | | 578 | 610 | 659 | 657 | 658 | 658 | 658 | 658 | 581 | 573 | 628 | 659 | 657 | 658 | 661 | 658 | 582 | 569 | 602 | 637 | 658 | 657 | 658 | 658 | 658 | |
| | | 578 | 610 | 659 | 657 | 658 | 658 | 658 | 658 | 582 | 568 | 616 | 648 | 658 | 658 | 661 | 658 | 583 | 571 | 590 | 623 | 649 | 658 | 657 | 658 | 658 | |
| 130 | 44-X | 221 | 229 | 247 | 0 | 0 | 0 | 0 | 0 | 222 | 217 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 231 | 239 | 253 | 0 | 0 | 0 | 0 | 0 | 232 | 227 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 473 | 490 | 513 | 511 | 510 | 512 | 512 | 512 | 475 | 464 | 502 | 513 | 511 | 510 | 514 | 512 | 476 | 466 | 481 | 508 | 512 | 511 | 510 | 512 | 512 | |
| | | 579 | 600 | 649 | 658 | 656 | 658 | 658 | 658 | 582 | 568 | 616 | 648 | 658 | 658 | 661 | 658 | 583 | 571 | 590 | 623 | 649 | 658 | 657 | 658 | 658 | |
| | | 579 | 600 | 649 | 658 | 656 | 658 | 658 | 658 | 582 | 568 | 616 | 648 | 658 | 658 | 661 | 658 | 584 | 574 | 589 | 611 | 636 | 656 | 657 | 657 | 657 | |
| 140 | 44-X | 221 | 220 | 243 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 232 | 230 | 253 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 474 | 471 | 513 | 512 | 511 | 510 | 512 | 512 | 476 | 466 | 493 | 513 | 512 | 511 | 510 | 512 | 476 | 468 | 480 | 498 | 513 | 512 | 511 | 510 | 510 | |
| | | 580 | 577 | 638 | 659 | 657 | 657 | 658 | 658 | 583 | 571 | 605 | 637 | 659 | 658 | 657 | 658 | 584 | 574 | 589 | 611 | 636 | 656 | 657 | 657 | 657 | |
| | | 580 | 577 | 638 | 659 | 657 | 657 | 658 | 658 | 583 | 571 | 605 | 637 | 659 | 658 | 657 | 658 | 584 | 575 | 578 | 599 | 624 | 644 | 658 | 657 | 657 | |
| 150 | 44-X | 222 | 216 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 232 | 226 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 474 | 463 | 513 | 513 | 511 | 510 | 512 | 512 | 476 | 467 | 485 | 511 | 513 | 512 | 511 | 510 | 477 | 470 | 472 | 489 | 509 | 512 | 512 | 512 | 512 | |
| | | 581 | 568 | 628 | 659 | 658 | 657 | 658 | 658 | 583 | 573 | 595 | 626 | 650 | 658 | 657 | 658 | 584 | 575 | 578 | 599 | 624 | 644 | 658 | 657 | 657 | |
| | | 581 | 568 | 628 | 659 | 658 | 657 | 658 | 658 | 583 | 573 | 595 | 626 | 650 | 658 | 657 | 658 | 584 | 577 | 565 | 589 | 613 | 632 | 649 | 658 | 658 | |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 475 | 465 | 506 | 513 | 512 | 511 | 510 | 512 | 477 | 469 | 478 | 502 | 513 | 512 | 512 | 0 | 477 | 471 | 461 | 481 | 500 | 513 | 0 | 0 | 0 | |
| | | 582 | 570 | 619 | 650 | 659 | 657 | 657 | 658 | 584 | 575 | 586 | 616 | 639 | 658 | 658 | 657 | 585 | 577 | 565 | 589 | 613 | 632 | 649 | 658 | 658 | |
| | | 582 | 570 | 619 | 650 | 659 | 657 | 657 | 658 | 584 | 575 | 586 | 616 | 639 | 658 | 658 | 657 | 585 | 577 | 565 | 589 | 613 | 632 | 649 | 658 | 658 | |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 476 | 467 | 499 | 514 | 513 | 512 | 511 | 510 | 477 | 470 | 466 | 495 | 514 | 513 | 0 | 0 | 478 | 472 | 463 | 480 | 492 | 0 | 0 | 0 | 0 | |
| | | 583 | 572 | 611 | 641 | 659 | 658 | 657 | 656 | 585 | 576 | 571 | 606 | 629 | 648 | 659 | 658 | 586 | 578 | 568 | 589 | 603 | 622 | 638 | 652 | 652 | |
| | | 583 | 572 | 611 | 641 | 659 | 658 | 657 | 656 | 585 | 576 | 571 | 606 | 629 | 648 | 659 | 658 | 586 | 578 | 568 | 589 | 603 | 622 | 638 | 652 | 652 | |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 476 | 468 | 493 | 514 | 513 | 512 | 511 | 511 | 478 | 471 | 462 | 488 | 506 | 514 | 0 | 0 | 478</td | | | | | | | | | |



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2" x 80" Portrait Orientation

Table 1.2A Maximum Downward Force (lbs) Multi Span Only Exterior Conditions

| | | Table 1.2A Maximum Downward Force (lbs) Multi Span Only Exterior Conditions | | | | | | | | | | | | | | | | | | | | | | |
|-------|------------------------------|---|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|
| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | |
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 |
| 90 | 44-X | 209 | 246 | 252 | 253 | 253 | 0 | 0 | 0 | 184 | 226 | 253 | 253 | 0 | 0 | 0 | 0 | 173 | 195 | 247 | 254 | 0 | 0 | 0 |
| | | 228 | 248 | 253 | 254 | 254 | 0 | 0 | 0 | 202 | 246 | 254 | 254 | 0 | 0 | 0 | 0 | 190 | 214 | 254 | 255 | 0 | 0 | 0 |
| | | 448 | 506 | 530 | 532 | 532 | 532 | 532 | 532 | 451 | 483 | 525 | 532 | 532 | 534 | 532 | 452 | 464 | 508 | 533 | 532 | 532 | 532 | |
| | | 80 | 532 | 600 | 624 | 627 | 627 | 627 | 627 | 535 | 573 | 624 | 627 | 627 | 630 | 627 | 537 | 551 | 603 | 628 | 627 | 627 | 627 | |
| 100 | 44-X | 192 | 241 | 253 | 253 | 0 | 0 | 0 | 0 | 172 | 195 | 250 | 253 | 0 | 0 | 0 | 0 | 164 | 173 | 233 | 0 | 0 | 0 | 0 |
| | | 210 | 249 | 254 | 254 | 0 | 0 | 0 | 0 | 189 | 214 | 254 | 254 | 0 | 0 | 0 | 0 | 180 | 190 | 252 | 0 | 0 | 0 | 0 |
| | | 450 | 495 | 531 | 532 | 532 | 532 | 532 | 532 | 452 | 472 | 513 | 531 | 532 | 534 | 532 | 454 | 461 | 495 | 523 | 532 | 532 | 532 | |
| | | 80 | 534 | 588 | 625 | 627 | 627 | 627 | 627 | 537 | 560 | 609 | 625 | 627 | 630 | 627 | 539 | 547 | 587 | 620 | 627 | 627 | 627 | |
| 110 | 44-X | 180 | 217 | 253 | 253 | 0 | 0 | 0 | 0 | 164 | 174 | 236 | 0 | 0 | 0 | 0 | 158 | 159 | 204 | 0 | 0 | 0 | 0 | |
| | | 197 | 239 | 254 | 253 | 0 | 0 | 0 | 0 | 180 | 191 | 255 | 0 | 0 | 0 | 0 | 173 | 175 | 224 | 0 | 0 | 0 | 0 | |
| | | 451 | 486 | 527 | 530 | 532 | 532 | 532 | 532 | 454 | 462 | 502 | 529 | 530 | 532 | 534 | 532 | 455 | 447 | 483 | 510 | 531 | 532 | 532 |
| | | 80 | 536 | 577 | 625 | 625 | 627 | 627 | 627 | 539 | 549 | 596 | 626 | 625 | 627 | 630 | 627 | 524 | 529 | 573 | 606 | 626 | 627 | 627 |
| 120 | 44-X | 171 | 194 | 252 | 253 | 0 | 0 | 0 | 0 | 158 | 160 | 210 | 0 | 0 | 0 | 0 | 153 | 153 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 187 | 213 | 254 | 254 | 0 | 0 | 0 | 0 | 174 | 176 | 230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 453 | 478 | 517 | 531 | 532 | 532 | 532 | 532 | 455 | 449 | 492 | 518 | 531 | 532 | 534 | 532 | 454 | 446 | 472 | 499 | 519 | 531 | 532 |
| | | 80 | 537 | 567 | 614 | 626 | 627 | 627 | 627 | 526 | 532 | 584 | 615 | 626 | 627 | 630 | 627 | 508 | 508 | 560 | 592 | 616 | 625 | 627 |
| 130 | 44-X | 164 | 176 | 238 | 0 | 0 | 0 | 0 | 0 | 154 | 154 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 180 | 193 | 255 | 0 | 0 | 0 | 0 | 0 | 169 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 454 | 470 | 508 | 532 | 531 | 532 | 532 | 532 | 456 | 445 | 482 | 508 | 527 | 531 | 534 | 532 | 443 | 443 | 462 | 488 | 508 | 524 | 531 |
| | | 80 | 539 | 558 | 603 | 626 | 625 | 627 | 627 | 511 | 511 | 572 | 603 | 626 | 626 | 630 | 627 | 496 | 496 | 549 | 579 | 603 | 622 | 625 |
| 140 | 44-X | 159 | 162 | 215 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 174 | 178 | 237 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 455 | 452 | 500 | 525 | 531 | 531 | 532 | 532 | 446 | 446 | 474 | 499 | 518 | 532 | 531 | 532 | 435 | 435 | 461 | 478 | 498 | 514 | 527 |
| | | 80 | 528 | 537 | 594 | 624 | 626 | 625 | 627 | 627 | 499 | 499 | 562 | 592 | 615 | 626 | 625 | 627 | 486 | 486 | 518 | 568 | 591 | 610 |
| 150 | 44-X | 155 | 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 170 | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 456 | 445 | 492 | 517 | 532 | 531 | 532 | 532 | 438 | 438 | 466 | 490 | 509 | 524 | 531 | 531 | 428 | 428 | 440 | 470 | 489 | 504 | 518 |
| | | 80 | 514 | 514 | 584 | 614 | 627 | 625 | 627 | 490 | 490 | 535 | 582 | 604 | 622 | 626 | 625 | 479 | 479 | 492 | 557 | 580 | 599 | 614 |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 450 | 446 | 485 | 510 | 528 | 531 | 531 | 532 | 431 | 431 | 450 | 482 | 501 | 516 | 528 | 0 | 422 | 422 | 422 | 462 | 480 | 496 | 0 |
| | | 80 | 504 | 504 | 576 | 605 | 627 | 626 | 625 | 627 | 482 | 482 | 503 | 573 | 594 | 612 | 627 | 473 | 473 | 473 | 526 | 570 | 588 | 604 |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 442 | 442 | 479 | 502 | 521 | 532 | 531 | 531 | 425 | 425 | 431 | 475 | 493 | 508 | 0 | 0 | 418 | 418 | 418 | 448 | 472 | 0 | 0 |
| | | 80 | 495 | 495 | 568 | 596 | 618 | 627 | 626 | 625 | 476 | 476 | 482 | 557 | 585 | 603 | 618 | 627 | 467 | 467 | 467 | 501 | 560 | 578 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 436 | 436 | 473 | 496 | 514 | 528 | 532 | 531 | 421 | 421 | 421 | 469 | 486 | 500 | 0 | 0 | 414 | 414 | 414 | 431 | 0 | 0 | 0 |
| | | 80 | 487 | 487 | 535 | 588 | 610 | 627 | 627 | 626 | 470 | 470 | 470 | 524 | 577 | 594 | 609 | 621 | 463 | 463 | 482 | 529 | 569 | 584 |

Note: The Reactions shown in the tables above account for reactions associated with the exterior support of a multi span condition. See Max length for Multi Span Only for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 1.3 Maximum Horizontal Force (lbs) Multi span only Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 74 | 58 | 40 | 28 | 22 | 0 | 0 | 0 | 81 | 70 | 52 | 39 | 23 | 0 | 0 | 0 | 93 | 77 | 60 | 47 | 27 | 0 | 0 | 0 | |
| | | 77 | 59 | 41 | 29 | 22 | 0 | 0 | 0 | 84 | 74 | 53 | 40 | 23 | 0 | 0 | 0 | 97 | 80 | 61 | 47 | 28 | 0 | 0 | 0 | |
| | | 159 | 119 | 83 | 58 | 45 | 36 | 30 | 26 | 173 | 150 | 107 | 81 | 62 | 50 | 42 | 36 | 199 | 164 | 124 | 96 | 75 | 61 | 51 | 44 | |
| | | 80 | 194 | 154 | 106 | 75 | 57 | 47 | 39 | 34 | 211 | 184 | 137 | 104 | 80 | 65 | 55 | 47 | 244 | 202 | 157 | 124 | 96 | 78 | 66 | 57 |
| | 48-X | 78 | 66 | 47 | 35 | 0 | 0 | 0 | 0 | 84 | 78 | 60 | 47 | 0 | 0 | 0 | 0 | 99 | 84 | 67 | 44 | 0 | 0 | 0 | 0 | |
| | | 82 | 68 | 48 | 35 | 0 | 0 | 0 | 0 | 88 | 81 | 61 | 48 | 0 | 0 | 0 | 0 | 103 | 88 | 70 | 44 | 0 | 0 | 0 | 0 | |
| 100 | 48-XL | 168 | 59 | 51 | 45 | 40 | 36 | 33 | 31 | 77 | 75 | 67 | 60 | 54 | 50 | 46 | 92 | 86 | 84 | 78 | 71 | 64 | 60 | 56 | 52 | |
| | | 80 | 206 | 174 | 125 | 92 | 96 | 58 | 48 | 42 | 221 | 203 | 159 | 124 | 98 | 80 | 67 | 58 | 258 | 220 | 176 | 145 | 119 | 96 | 81 | 70 |
| | | 82 | 73 | 54 | 42 | 0 | 0 | 0 | 0 | 87 | 84 | 67 | 44 | 0 | 0 | 0 | 0 | 103 | 92 | 74 | 53 | 0 | 0 | 0 | 0 | |
| | | 86 | 76 | 55 | 42 | 0 | 0 | 0 | 0 | 91 | 88 | 69 | 44 | 0 | 0 | 0 | 0 | 108 | 96 | 77 | 53 | 0 | 0 | 0 | 0 | |
| | 48-XL | 175 | 155 | 111 | 86 | 90 | 54 | 46 | 39 | 187 | 180 | 141 | 111 | 92 | 75 | 63 | 54 | 221 | 194 | 158 | 129 | 107 | 91 | 76 | 66 | |
| | | 80 | 215 | 191 | 143 | 111 | 116 | 70 | 59 | 51 | 229 | 220 | 176 | 143 | 118 | 97 | 82 | 70 | 270 | 240 | 193 | 163 | 137 | 117 | 98 | 85 |
| 110 | 44-X | 85 | 79 | 61 | 48 | 0 | 0 | 0 | 0 | 90 | 87 | 73 | 50 | 0 | 0 | 0 | 0 | 107 | 99 | 77 | 60 | 0 | 0 | 0 | 0 | |
| | | 89 | 83 | 62 | 48 | 0 | 0 | 0 | 0 | 94 | 91 | 77 | 50 | 0 | 0 | 0 | 0 | 112 | 104 | 78 | 61 | 0 | 0 | 0 | 0 | |
| | | 182 | 169 | 126 | 98 | 107 | 64 | 54 | 47 | 192 | 187 | 157 | 125 | 104 | 89 | 75 | 65 | 228 | 212 | 171 | 145 | 121 | 104 | 91 | 78 | |
| | | 80 | 223 | 207 | 162 | 126 | 138 | 83 | 70 | 60 | 235 | 229 | 192 | 161 | 134 | 115 | 97 | 83 | 280 | 260 | 209 | 179 | 156 | 134 | 117 | 101 |
| | 48-X | 87 | 84 | 67 | 0 | 0 | 0 | 0 | 92 | 89 | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 110 | 106 | 85 | 0 | 0 | 0 | 0 | 0 | |
| | | 91 | 88 | 69 | 0 | 0 | 0 | 0 | 96 | 94 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 111 | 86 | 0 | 0 | 0 | 0 | 0 | |
| 120 | 48-XL | 187 | 180 | 140 | 110 | 123 | 76 | 64 | 55 | 196 | 192 | 168 | 140 | 117 | 101 | 89 | 76 | 235 | 227 | 182 | 158 | 135 | 117 | 104 | 92 | |
| | | 80 | 229 | 221 | 177 | 142 | 159 | 97 | 82 | 71 | 240 | 235 | 206 | 177 | 151 | 130 | 114 | 98 | 288 | 278 | 223 | 194 | 171 | 151 | 133 | 118 |
| | | 89 | 87 | 72 | 0 | 0 | 0 | 0 | 93 | 91 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 109 | 91 | 0 | 0 | 0 | 0 | 0 | |
| | | 94 | 91 | 75 | 0 | 0 | 0 | 0 | 97 | 95 | 78 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 114 | 95 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 191 | 186 | 153 | 122 | 138 | 87 | 74 | 64 | 200 | 195 | 179 | 153 | 130 | 113 | 99 | 88 | 241 | 234 | 192 | 169 | 149 | 130 | 115 | 104 | |
| | | 80 | 234 | 228 | 190 | 157 | 177 | 112 | 95 | 82 | 245 | 240 | 220 | 190 | 167 | 145 | 128 | 114 | 295 | 287 | 239 | 207 | 185 | 167 | 149 | 133 |
| 130 | 44-X | 91 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 93 | 70 | 0 | 0 | 0 | 0 | 0 | 115 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 95 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 99 | 97 | 70 | 0 | 0 | 0 | 0 | 0 | 120 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 195 | 190 | 165 | 134 | 152 | 97 | 85 | 73 | 203 | 199 | 189 | 165 | 142 | 124 | 110 | 99 | 245 | 239 | 208 | 179 | 161 | 143 | 127 | 92 | |
| | | 80 | 239 | 233 | 203 | 173 | 196 | 125 | 109 | 94 | 249 | 244 | 231 | 203 | 180 | 160 | 141 | 127 | 300 | 293 | 255 | 219 | 197 | 179 | 164 | 148 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 140 | 48-XL | 198 | 194 | 175 | 146 | 166 | 107 | 94 | 83 | 206 | 202 | 197 | 175 | 154 | 135 | 121 | 86 | 249 | 244 | 220 | 188 | 171 | 155 | 118 | 104 | |
| | | 80 | 243 | 238 | 214 | 185 | 214 | 137 | 121 | 107 | 253 | 247 | 241 | 214 | 192 | 174 | 155 | 140 | 305 | 299 | 269 | 232 | 209 | 191 | 176 | 162 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 201 | 197 | 184 | 157 | 180 | 116 | 103 | 92 | 209 | 205 | 200 | 183 | 166 | 146 | 107 | 96 | 253 | 248 | 231 | 197 | 179 | 146 | 129 | 116 | |
| | | 80 | 246 | 241 | 225 | 196 | 232 | 150 | 133 | 119 | 256 | 251 | 244 | 225 | 203 | 185 | 168 | 153 | 309 | 303 | 283 | 246 | 220 | 202 | 187 | 174 |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 195 | 190 | 165 | 134 | 152 | 97 | 85 | 73 | 203 | 199 | 189 | 165 | 142 | 124 | 110 | 99 | 245 | 239 | 208 | 179 | 161 | 143 | 127 | 92 | |
| | 48-XL | 80 | 239 | 233 | 203 | 173 | 196 | 125 | 109 | 94 | 249 | 244 | 231 | 203 | 180 | 160 | 141 | 127 | 300 | 293 | 255 | 219 | 197 | 179 | 164 | 148 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 198 | 194 | 175 | 146 | 166 | 107 | 94 | 83 | 206 | 202 | 197 | 175 | 154 | 135 | 121 | 86 | 249 | 244 | 220 | 188 | 171 | 155 | 118 | 104 | |
| | 48-XL | 80 | 243 | 238 | 214 | 185 | 214 | 137 | 121 | 107 | 253 | 247 | 241 | 214 | 192 | 174 | 155 | 140 | 305 | 299 | 269 | 232 | 209 | 191 | 176 | 162 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 170 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 201 | 197 | 184 | 157 | 180 | 116 | 103 | 92 | 209 | 205 | 200 | 183 | 166 | 146 | 107 | 96 | 253 | 248 | 231 | | | | | | |



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 1.3A Maximum Horizontal Force (lbs) Multi span only Exterior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 44-X | 71 | 59 | 41 | 29 | 22 | 0 | 0 | 0 | 74 | 68 | 53 | 40 | 23 | 0 | 0 | 0 | 89 | 74 | 60 | 48 | 28 | 0 | 0 | 0 |
| | | 48-X | 77 | 59 | 41 | 29 | 22 | 0 | 0 | 0 | 81 | 74 | 53 | 40 | 23 | 0 | 0 | 0 | 97 | 75 | 61 | 48 | 28 | 0 | 0 | 0 |
| | | 48-XL | 152 | 121 | 86 | 60 | 46 | 38 | 32 | 27 | 166 | 144 | 110 | 84 | 64 | 52 | 44 | 38 | 191 | 158 | 123 | 100 | 78 | 63 | 53 | 46 |
| | | 80 | 181 | 144 | 101 | 71 | 55 | 44 | 37 | 32 | 197 | 171 | 130 | 99 | 76 | 62 | 52 | 45 | 227 | 187 | 146 | 118 | 92 | 74 | 63 | 54 |
| | | 100 | 69 | 66 | 48 | 36 | 0 | 0 | 0 | 0 | 71 | 69 | 61 | 48 | 0 | 0 | 0 | 0 | 86 | 83 | 65 | 45 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 44-X | 75 | 68 | 48 | 36 | 0 | 0 | 0 | 0 | 78 | 72 | 62 | 48 | 0 | 0 | 0 | 0 | 95 | 86 | 70 | 45 | 0 | 0 | 0 | 0 |
| | | 48-XL | 161 | 136 | 101 | 75 | 57 | 46 | 39 | 34 | 173 | 159 | 124 | 100 | 79 | 64 | 54 | 47 | 203 | 173 | 138 | 115 | 96 | 78 | 66 | 57 |
| | | 80 | 191 | 162 | 119 | 88 | 68 | 55 | 46 | 40 | 206 | 189 | 148 | 118 | 94 | 76 | 64 | 55 | 240 | 205 | 164 | 136 | 113 | 92 | 77 | 67 |
| | | 44-X | 67 | 67 | 55 | 43 | 0 | 0 | 0 | 0 | 70 | 70 | 65 | 44 | 0 | 0 | 0 | 0 | 84 | 84 | 69 | 54 | 0 | 0 | 0 | 0 |
| | | 48-X | 74 | 74 | 55 | 43 | 0 | 0 | 0 | 0 | 76 | 76 | 70 | 45 | 0 | 0 | 0 | 0 | 92 | 92 | 70 | 54 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 44-X | 168 | 150 | 115 | 90 | 69 | 56 | 47 | 41 | 179 | 173 | 138 | 115 | 95 | 78 | 66 | 57 | 212 | 188 | 151 | 128 | 111 | 94 | 79 | 68 |
| | | 80 | 200 | 178 | 136 | 105 | 82 | 66 | 56 | 48 | 213 | 205 | 164 | 136 | 112 | 92 | 78 | 67 | 251 | 223 | 180 | 152 | 131 | 111 | 93 | 81 |
| | | 44-X | 66 | 66 | 62 | 49 | 0 | 0 | 0 | 0 | 68 | 68 | 64 | 51 | 0 | 0 | 0 | 0 | 83 | 83 | 78 | 61 | 0 | 0 | 0 | 0 |
| | | 48-X | 72 | 72 | 62 | 49 | 0 | 0 | 0 | 0 | 75 | 75 | 70 | 51 | 0 | 0 | 0 | 0 | 91 | 91 | 79 | 61 | 0 | 0 | 0 | 0 |
| | | 48-XL | 174 | 162 | 127 | 102 | 82 | 67 | 56 | 49 | 184 | 179 | 150 | 127 | 109 | 93 | 78 | 67 | 219 | 204 | 164 | 140 | 123 | 108 | 94 | 81 |
| 120 | 48-XL | 80 | 207 | 192 | 151 | 120 | 97 | 79 | 66 | 57 | 215 | 213 | 178 | 151 | 128 | 109 | 92 | 79 | 260 | 242 | 194 | 167 | 146 | 128 | 111 | 96 |
| | | 44-X | 65 | 65 | 65 | 0 | 0 | 0 | 0 | 0 | 68 | 68 | 68 | 0 | 0 | 0 | 0 | 82 | 82 | 82 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 71 | 71 | 69 | 0 | 0 | 0 | 0 | 0 | 74 | 74 | 72 | 0 | 0 | 0 | 0 | 90 | 90 | 87 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 180 | 173 | 138 | 115 | 95 | 79 | 66 | 57 | 188 | 184 | 162 | 138 | 121 | 105 | 92 | 79 | 226 | 218 | 175 | 152 | 134 | 120 | 108 | 96 |
| | | 80 | 213 | 206 | 164 | 135 | 112 | 93 | 78 | 67 | 222 | 214 | 192 | 164 | 143 | 124 | 108 | 93 | 268 | 258 | 208 | 180 | 159 | 143 | 127 | 113 |
| 140 | 48-XL | 44-X | 64 | 64 | 64 | 0 | 0 | 0 | 0 | 0 | 67 | 67 | 67 | 0 | 0 | 0 | 0 | 81 | 81 | 81 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 70 | 70 | 70 | 0 | 0 | 0 | 0 | 0 | 73 | 73 | 73 | 0 | 0 | 0 | 0 | 89 | 89 | 89 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 184 | 179 | 149 | 126 | 106 | 91 | 77 | 66 | 191 | 187 | 172 | 149 | 131 | 117 | 103 | 92 | 231 | 225 | 187 | 162 | 145 | 131 | 119 | 108 |
| | | 80 | 213 | 212 | 177 | 149 | 125 | 107 | 90 | 78 | 222 | 221 | 204 | 177 | 156 | 138 | 122 | 108 | 268 | 267 | 222 | 193 | 172 | 155 | 141 | 127 |
| | | 150 | 64 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 66 | 0 | 0 | 0 | 0 | 0 | 80 | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 44-X | 70 | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 73 | 0 | 0 | 0 | 0 | 0 | 88 | 88 | 88 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 187 | 183 | 159 | 135 | 117 | 101 | 88 | 76 | 195 | 190 | 181 | 159 | 141 | 127 | 114 | 103 | 235 | 230 | 200 | 172 | 155 | 140 | 129 | 95 |
| | | 80 | 211 | 211 | 188 | 161 | 138 | 119 | 104 | 89 | 220 | 220 | 208 | 188 | 167 | 151 | 135 | 121 | 266 | 266 | 237 | 204 | 184 | 167 | 153 | 141 |
| | | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 186 | 186 | 168 | 145 | 127 | 111 | 98 | 86 | 195 | 194 | 185 | 168 | 150 | 136 | 124 | 90 | 236 | 234 | 211 | 182 | 164 | 150 | 123 | 109 |
| | | 80 | 208 | 208 | 208 | 192 | 171 | 154 | 137 | 123 | 216 | 216 | 216 | 206 | 198 | 182 | 168 | 156 | 261 | 261 | 241 | 215 | 197 | 184 | 163 | 132 |
| | | 180 | 208 | 208 | 208 | 192 | 171 | 154 | 137 | 123 | 216 | 216 | 216 | 206 | 198 | 182 | 168 | 156 | 261 | 261 | 241 | 215 | 197 | 184 | 163 | 155 |

Note: The Reactions shown in the tables above account for reactions associated with the exterior support of a multi span condition. See Max length for Multi Span Only for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.4 Max Uplift Force (lbs) Multi span only Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|------|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | -123 | -97 | -67 | -47 | -36 | 0 | 0 | 0 | -145 | -126 | -94 | -71 | 0 | 0 | 0 | 0 | -156 | -143 | -111 | -87 | 0 | 0 | 0 | 0 | 0 | |
| | | -129 | -98 | -68 | -48 | -37 | 0 | 0 | 0 | -152 | -132 | -95 | -71 | 0 | 0 | 0 | 0 | -163 | -149 | -113 | -88 | 0 | 0 | 0 | 0 | 0 | |
| | | -264 | -199 | -137 | -97 | -74 | -60 | -51 | -44 | -310 | -269 | -192 | -145 | -111 | -90 | -76 | -66 | -334 | -306 | -230 | -179 | -139 | -113 | -95 | -82 | -82 | |
| | | 80 | -323 | -256 | -177 | -124 | -96 | -78 | -65 | -56 | -380 | -331 | -247 | -187 | -143 | -116 | -98 | -84 | -409 | -374 | -291 | -230 | -179 | -145 | -122 | -105 | |
| | | -138 | -116 | -83 | -61 | 0 | 0 | 0 | 0 | -157 | -145 | -113 | -88 | 0 | 0 | 0 | 0 | -167 | -161 | -128 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 100 | 48-X | -144 | -119 | -84 | -62 | 0 | 0 | 0 | 0 | -164 | -151 | -114 | -89 | 0 | 0 | 0 | 0 | -175 | -168 | -134 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -295 | -241 | -170 | -126 | -97 | -78 | -66 | -57 | -336 | -310 | -231 | -180 | -142 | -116 | -98 | -82 | -357 | -344 | -273 | -215 | -177 | -143 | -121 | -104 | -104 | |
| | | 80 | -361 | -305 | -219 | -162 | -124 | -101 | -85 | -73 | -412 | -379 | -296 | -231 | -183 | -149 | -126 | -105 | -438 | -421 | -336 | -277 | -227 | -184 | -155 | -134 | |
| | | -149 | -133 | -99 | -76 | 0 | 0 | 0 | 0 | -167 | -161 | -128 | 0 | 0 | 0 | 0 | 0 | -175 | -171 | -144 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 156 | -139 | -100 | -77 | 0 | 0 | 0 | 0 | -175 | -168 | -133 | 0 | 0 | 0 | 0 | 0 | -184 | -179 | -151 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 110 | 48-XL | -320 | -282 | -203 | -157 | -122 | -99 | -83 | -72 | -357 | -344 | -269 | -212 | -175 | -144 | -121 | -105 | -376 | -366 | -308 | -252 | -208 | -177 | -149 | -129 | -129 | |
| | | 80 | -392 | -348 | -261 | -202 | -156 | -127 | -107 | -92 | -438 | -422 | -337 | -273 | -225 | -185 | -156 | -140 | -460 | -448 | -377 | -319 | -268 | -228 | -192 | -165 | -165 |
| | | -159 | -148 | -115 | -90 | 0 | 0 | 0 | 0 | -175 | -170 | -143 | 0 | 0 | 0 | 0 | 0 | -182 | -178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -167 | -155 | -116 | -91 | 0 | 0 | 0 | 0 | -183 | -178 | -149 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -341 | -316 | -236 | -184 | -149 | -121 | -102 | -88 | -374 | -364 | -305 | -245 | -204 | -174 | -147 | -133 | -390 | -382 | -338 | -287 | -240 | -207 | -180 | -155 | -155 | |
| 120 | 48-XL | 80 | -417 | -388 | -303 | -237 | -191 | -155 | -131 | -113 | -459 | -446 | -374 | -315 | -262 | -224 | -189 | -236 | -478 | -468 | -415 | -355 | -309 | -266 | -232 | -200 | -200 |
| | | -167 | -161 | -129 | 0 | 0 | 0 | 0 | 0 | -181 | -177 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -175 | -169 | -132 | 0 | 0 | 0 | 0 | 0 | -190 | -185 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -358 | -345 | -267 | -211 | -175 | -145 | -122 | -105 | -388 | -379 | -333 | -276 | -232 | -200 | -175 | -155 | -402 | -394 | -366 | -317 | -271 | -235 | -208 | -185 | -185 | |
| | | 80 | -439 | -423 | -338 | -272 | -225 | -186 | -157 | -135 | -475 | -464 | -408 | -349 | -298 | -257 | -225 | -282 | -493 | -483 | -448 | -389 | -344 | -303 | -267 | -237 | -237 |
| 130 | 48-XL | -174 | -169 | -141 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -182 | -177 | -147 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -372 | -363 | -298 | -238 | -198 | -170 | -143 | -124 | -399 | -391 | -359 | -307 | -260 | -225 | -199 | -165 | -258 | -412 | -405 | -390 | -343 | -302 | -264 | -234 | -210 | |
| | | 80 | -456 | -444 | -370 | -306 | -255 | -219 | -185 | -159 | -489 | -479 | -439 | -380 | -334 | -290 | -256 | -332 | -505 | -496 | -478 | -420 | -374 | -338 | -301 | -270 | -270 |
| | | -180 | -175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 140 | 48-XL | -188 | -184 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -385 | -375 | -326 | -265 | -222 | -191 | -167 | -144 | -409 | -401 | -382 | -334 | -287 | -250 | -222 | -192 | -240 | -414 | -405 | -366 | -329 | -291 | -260 | 0 | 0 | |
| | | 80 | -471 | -460 | -400 | -340 | -286 | -246 | -215 | -185 | -501 | -492 | -468 | -409 | -364 | -322 | -286 | -376 | -515 | -507 | -496 | -448 | -403 | -366 | -334 | -302 | -302 |
| | | -180 | -175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -395 | -386 | -348 | -290 | -245 | -213 | -188 | -166 | -417 | -410 | -400 | -356 | -314 | -275 | -245 | 0 | -427 | -421 | -413 | -387 | -350 | -318 | 0 | 0 | 0 | |
| 160 | 48-XL | -484 | -474 | -427 | -368 | -316 | -274 | -241 | -213 | -511 | -503 | -491 | -436 | -390 | -354 | -316 | -347 | -523 | -516 | -506 | -474 | -429 | -392 | -362 | -333 | -333 | |
| | | 80 | -495 | -485 | -452 | -393 | -345 | -301 | -266 | -239 | -519 | -512 | -501 | -460 | -415 | -379 | -345 | -458 | -531 | -524 | -514 | -497 | -454 | -417 | -386 | -360 | -360 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -404 | -396 | -369 | -315 | -268 | -234 | -207 | -186 | -424 | -417 | -409 | -376 | -339 | -300 | 0 | -433 | -428 | -420 | -406 | -370 | 0 | 0 | 0 | 0 | 0 | |
| 170 | 48-XL | 80 | -495 | -485 | -452 | -393 | -345 | -301 | -266 | -239 | -519 | -512 | -501 | -460 | -415 | -379 | -345 | -458 | -531 | -524 | -514 | -497 | -454 | -417 | -386 | -360 | -360 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -411 | -404 | -388 | -339 | -291 | -255 | -226 | -204 | -429 | -424 | -416 | -394 | -358 | -323 | 0 | 0 | -438 | -433 | -426 | -419 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -504 | -495 | -475 | -417 | -372 | -328 | -291 | -262 | -526 | -519 | -509 | -483 | -439 | -402 | -345 | -499 | -537 | -531 | -522 | -514 | -476 | -440 | -409 | -409 | -409 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: The Reactions shown in the tables above account for reactions associated with the exterior support of a multi span condition. See Max length for Multi Span Only for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 1.4A Max Uplift Force (lbs) Multi span only Exterior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|------|--|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | | |
| 90 | 44-X | -118 | -98 | -68 | -48 | -37 | 0 | 0 | 0 | -122 | -122 | -95 | -72 | 0 | 0 | 0 | 0 | -123 | -123 | -111 | -89 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | -129 | -99 | -68 | -48 | -37 | 0 | 0 | 0 | -133 | -132 | -95 | -72 | 0 | 0 | 0 | 0 | -135 | -135 | -114 | -89 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -253 | -202 | -143 | -101 | -77 | -63 | -53 | -46 | -298 | -260 | -198 | -151 | -116 | -94 | -79 | -68 | -321 | -293 | -228 | -186 | -145 | -117 | -99 | -85 | | | |
| | 80 | -301 | -239 | -168 | -119 | -91 | -74 | -62 | -54 | -354 | -308 | -234 | -178 | -136 | -111 | -93 | -80 | -381 | -348 | -271 | -219 | -170 | -138 | -116 | -100 | | | |
| | 44-X | -120 | -116 | -84 | -62 | 0 | 0 | 0 | 0 | -123 | -123 | -113 | -89 | 0 | 0 | 0 | 0 | -124 | -124 | -124 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 100 | 48-X | -132 | -120 | -85 | -63 | 0 | 0 | 0 | 0 | -135 | -135 | -115 | -89 | 0 | 0 | 0 | 0 | -136 | -136 | -134 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -283 | -239 | -177 | -131 | -101 | -82 | -69 | -59 | -323 | -297 | -232 | -187 | -148 | -120 | -102 | -125 | -343 | -330 | -264 | -219 | -184 | -149 | -125 | -108 | | | |
| | 80 | -336 | -284 | -209 | -154 | -119 | -96 | -81 | -70 | -383 | -353 | -275 | -220 | -175 | -142 | -120 | -148 | -407 | -392 | -313 | -260 | -216 | -176 | -148 | -128 | | | |
| | 44-X | -122 | -122 | -101 | -78 | 0 | 0 | 0 | 0 | -124 | -124 | -124 | 0 | 0 | 0 | 0 | 0 | -125 | -125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | 134 | -134 | -101 | -78 | 0 | 0 | 0 | 0 | -136 | -136 | -134 | 0 | 0 | 0 | 0 | 0 | -137 | -137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 110 | 48-XL | -307 | -273 | -209 | -163 | -126 | -103 | -86 | -74 | -343 | -330 | -264 | -220 | -182 | -149 | -126 | -157 | -361 | -351 | -296 | -250 | -216 | -184 | -155 | -134 | | | |
| | 80 | -365 | -324 | -249 | -192 | -149 | -121 | -102 | -88 | -407 | -392 | -313 | -260 | -215 | -176 | -149 | -184 | -416 | -416 | -351 | -297 | -255 | -217 | -183 | -158 | | | |
| | 44-X | -123 | -123 | -116 | -91 | 0 | 0 | 0 | 0 | -125 | -125 | -125 | 0 | 0 | 0 | 0 | 0 | -126 | -126 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | -135 | -135 | -117 | -92 | 0 | 0 | 0 | 0 | -137 | -137 | -137 | 0 | 0 | 0 | 0 | 0 | -137 | -137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -327 | -304 | -238 | -191 | -155 | -125 | -106 | -91 | -359 | -350 | -293 | -247 | -212 | -181 | -153 | -191 | -374 | -366 | -325 | -278 | -244 | -215 | -187 | -162 | | | |
| 120 | 80 | -388 | -361 | -283 | -226 | -182 | -148 | -124 | -107 | -415 | -415 | -348 | -294 | -249 | -213 | -180 | -225 | -418 | -418 | -385 | -331 | -289 | -253 | -221 | -190 | | | |
| | 44-X | -124 | -124 | -124 | 0 | 0 | 0 | 0 | 0 | -126 | -126 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | -136 | -136 | -133 | 0 | 0 | 0 | 0 | 0 | -138 | -138 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -344 | -332 | -265 | -220 | -182 | -150 | -127 | -109 | -372 | -364 | -320 | -274 | -239 | -208 | -182 | -228 | -375 | -375 | -351 | -305 | -269 | -241 | -216 | -192 | | | |
| | 80 | -408 | -394 | -314 | -259 | -214 | -177 | -149 | -129 | -417 | -417 | -380 | -325 | -284 | -245 | -215 | -269 | -420 | -420 | -417 | -362 | -320 | -286 | -255 | -226 | | | |
| 130 | 44-X | -125 | -125 | -125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | -137 | -137 | -137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -358 | -348 | -290 | -244 | -206 | -177 | -149 | -129 | -375 | -375 | -344 | -298 | -263 | -234 | -207 | -268 | -376 | -376 | -374 | -329 | -293 | -265 | -241 | -219 | | | |
| | 80 | -415 | -413 | -344 | -290 | -243 | -208 | -176 | -152 | -419 | -419 | -409 | -354 | -312 | -276 | -244 | -316 | -421 | -421 | -421 | -390 | -348 | -314 | -286 | -258 | | | |
| | 44-X | -126 | -126 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 140 | 48-X | -138 | -138 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -369 | -360 | -313 | -267 | -231 | -199 | -174 | -150 | -376 | -376 | -366 | -321 | -285 | -257 | -231 | -304 | -377 | -377 | -351 | -316 | -287 | -263 | 0 | 0 | | | |
| | 80 | -417 | -417 | -372 | -317 | -272 | -234 | -204 | -176 | -420 | -420 | -420 | -381 | -338 | -305 | -272 | -358 | -422 | -422 | -422 | -417 | -375 | -340 | -312 | -287 | | | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 150 | 48-XL | -374 | -371 | -334 | -288 | -253 | -221 | -195 | -172 | -377 | -377 | -377 | -341 | -306 | -277 | -253 | 0 | -378 | -378 | -378 | -371 | -336 | -307 | 0 | 0 | | | |
| | 80 | -417 | -417 | -372 | -342 | -300 | -261 | -230 | -203 | -421 | -421 | -421 | -405 | -363 | -329 | -301 | -397 | -423 | -423 | -423 | -423 | -423 | -423 | -399 | -365 | -336 | -312 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -375 | -375 | -354 | -308 | -273 | -243 | -215 | -193 | -378 | -378 | -378 | -361 | -325 | -297 | 0 | -379 | -379 | -379 | -379 | -355 | 0 | 0 | 0 | 0 | | | |
| 160 | 80 | -420 | -420 | -420 | -366 | -324 | -286 | -254 | -228 | -422 | -422 | -422 | -422 | -386 | -352 | -323 | -436 | -423 | -423 | -423 | -423 | -423 | -423 | -422 | -388 | -359 | -334 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -376 | -376 | -372 | -327 | -291 | -263 | -235 | -212 | -378 | -378 | -378 | -344 | -315 | 0 | 0 | -379 | -379 | -379 | -379 | 0 | 0 | 0 | 0 | 0 | | | |
| | 80 | -421 | -421 | -421 | -388 | -346 | -312 | -277 | -250 | -423 | -423 | -423 | -408 | -374 | -307 | -471 | -424 | -424 | -424 | -424 | -424 | -424 | -409 | -381 | 0 | 0 | | |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -375 | -375 | -354 | -308 | -273 | -243 | -215 | -193 | -378 | -378 | -378 | -361 | -325 | -297 | 0 | -379 | -379 | -379 | -379 | -355 | 0 | 0 | 0 | 0 | | | |
| | 80 | -420 | -420 | -420 | -366 | -324 | -286 | -254 | -228 | -422 | -422 | -422 | -422 | -386 | -352 | -323 | -436 | -423 | -423 | -423 | -423 | -423 | -423 | -422 | -388 | -359 | -334 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 180 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 48-XL | -376 | -376 | -372 | -327 | -291 | -263 | -235 | -212 | -378 | -378 | -378 | -344 | -315 | 0 | 0 | -379 | -379 | -379 | -379 | 0 | 0 | 0 | 0 | 0 | | | |
| | 80 | -421 | -421 | -421 | -388 | -346 | -312 | -277 | -250 | -423 | -423 | -423 | -408 | -374 | -307 | -471 | -424 | -424 | -424 | -424 | -424 | -424 | -409 | -381 | 0 | 0 | | |

Note: The Reactions shown in the tables above account for reactions associated with the exterior support of a multi span condition. See Max length for Multi Span Only for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.5 Max Length L (inches) for Single Span Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|-----|----|----|----|----|----|---------------------------|-----|-----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 |
| 90 | 44-X | 60 | 47 | 32 | 23 | 17 | 0 | 0 | 0 | 47 | 41 | 30 | 23 | 0 | 0 | 0 | 0 | 41 | 37 | 29 | 22 | 0 | 0 | 0 | 0 |
| | 48-X | 61 | 56 | 39 | 28 | 21 | 0 | 0 | 0 | 58 | 51 | 36 | 28 | 0 | 0 | 0 | 0 | 50 | 46 | 35 | 27 | 0 | 0 | 0 | 0 |
| | 48-XL | 127 | 95 | 66 | 46 | 36 | 29 | 24 | 21 | 99 | 86 | 61 | 46 | 36 | 29 | 24 | 21 | 86 | 78 | 59 | 46 | 36 | 29 | 24 | 21 |
| | 80 | 179 | 143 | 99 | 69 | 53 | 43 | 36 | 31 | 140 | 122 | 92 | 69 | 53 | 43 | 37 | 31 | 121 | 111 | 86 | 69 | 53 | 43 | 36 | 31 |
| | 44-X | 52 | 51 | 37 | 27 | 0 | 0 | 0 | 0 | 47 | 43 | 34 | 26 | 0 | 0 | 0 | 0 | 40 | 39 | 31 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 52 | 43 | 30 | 23 | 0 | 0 | 0 | 0 | 40 | 37 | 28 | 22 | 0 | 0 | 0 | 0 | 34 | 33 | 26 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 109 | 89 | 63 | 46 | 36 | 29 | 24 | 21 | 84 | 77 | 58 | 45 | 36 | 29 | 24 | 21 | 72 | 69 | 55 | 43 | 36 | 29 | 24 | 21 |
| | 80 | 153 | 130 | 94 | 69 | 53 | 43 | 36 | 31 | 119 | 109 | 85 | 67 | 53 | 43 | 37 | 31 | 102 | 98 | 78 | 65 | 53 | 43 | 36 | 31 |
| | 44-X | 45 | 40 | 29 | 22 | 0 | 0 | 0 | 0 | 34 | 33 | 26 | 0 | 0 | 0 | 0 | 0 | 29 | 28 | 24 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 45 | 40 | 29 | 22 | 0 | 0 | 0 | 0 | 34 | 33 | 26 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 24 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 94 | 83 | 60 | 46 | 36 | 29 | 24 | 21 | 72 | 69 | 54 | 43 | 35 | 29 | 24 | 21 | 61 | 60 | 50 | 41 | 34 | 29 | 24 | 21 |
| | 80 | 133 | 118 | 89 | 69 | 53 | 43 | 36 | 31 | 102 | 98 | 78 | 64 | 53 | 43 | 37 | 31 | 87 | 84 | 71 | 60 | 51 | 43 | 36 | 31 |
| | 44-X | 39 | 37 | 28 | 22 | 0 | 0 | 0 | 0 | 30 | 29 | 24 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 39 | 37 | 27 | 21 | 0 | 0 | 0 | 0 | 30 | 29 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 82 | 76 | 56 | 44 | 36 | 29 | 24 | 21 | 62 | 61 | 51 | 41 | 34 | 29 | 24 | 21 | 53 | 52 | 46 | 39 | 32 | 28 | 24 | 21 |
| 120 | 80 | 115 | 107 | 84 | 66 | 53 | 43 | 36 | 31 | 88 | 86 | 72 | 61 | 51 | 43 | 37 | 31 | 75 | 73 | 65 | 55 | 48 | 42 | 36 | 31 |
| | 44-X | 34 | 35 | 26 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 34 | 35 | 26 | 0 | 0 | 0 | 0 | 0 | 26 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 72 | 69 | 53 | 42 | 35 | 29 | 24 | 21 | 54 | 53 | 46 | 38 | 32 | 28 | 24 | 21 | 46 | 45 | 42 | 36 | 31 | 27 | 24 | 21 |
| | 80 | 101 | 98 | 78 | 63 | 52 | 43 | 36 | 31 | 77 | 75 | 66 | 56 | 48 | 42 | 37 | 31 | 65 | 63 | 59 | 51 | 45 | 40 | 35 | 31 |
| 130 | 44-X | 30 | 31 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 30 | 32 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 63 | 61 | 50 | 40 | 34 | 29 | 24 | 21 | 47 | 47 | 43 | 36 | 31 | 27 | 24 | 21 | 40 | 39 | 38 | 33 | 29 | 26 | 23 | 20 |
| | 80 | 89 | 87 | 72 | 60 | 50 | 43 | 36 | 31 | 67 | 66 | 60 | 52 | 46 | 40 | 35 | 31 | 57 | 56 | 54 | 47 | 42 | 38 | 34 | 31 |
| | 44-X | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-X | 27 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 56 | 55 | 48 | 39 | 32 | 28 | 24 | 21 | 42 | 41 | 39 | 34 | 29 | 26 | 23 | 20 | 35 | 35 | 34 | 31 | 28 | 24 | 22 | 0 |
| | 80 | 79 | 77 | 67 | 57 | 48 | 42 | 36 | 31 | 59 | 58 | 55 | 48 | 43 | 38 | 34 | 31 | 50 | 49 | 48 | 43 | 39 | 35 | 33 | 29 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 50 | 49 | 44 | 37 | 31 | 27 | 24 | 21 | 37 | 37 | 36 | 32 | 28 | 25 | 22 | 0 | 31 | 31 | 30 | 28 | 26 | 23 | 0 | 0 |
| | 80 | 71 | 69 | 62 | 54 | 47 | 40 | 36 | 31 | 53 | 52 | 51 | 45 | 40 | 37 | 33 | 30 | 44 | 44 | 43 | 40 | 36 | 33 | 31 | 28 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 45 | 44 | 41 | 35 | 30 | 26 | 23 | 21 | 33 | 33 | 32 | 30 | 27 | 24 | 0 | 0 | 28 | 28 | 27 | 26 | 24 | 0 | 0 | 0 |
| 170 | 80 | 64 | 62 | 58 | 51 | 45 | 39 | 34 | 31 | 47 | 47 | 46 | 42 | 38 | 34 | 32 | 29 | 40 | 39 | 38 | 37 | 34 | 31 | 29 | 27 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 41 | 40 | 38 | 33 | 29 | 25 | 22 | 20 | 30 | 30 | 29 | 28 | 25 | 23 | 0 | 0 | 25 | 25 | 24 | 24 | 0 | 0 | 0 | 0 |
| | 80 | 57 | 56 | 54 | 47 | 42 | 38 | 33 | 30 | 42 | 42 | 41 | 39 | 35 | 32 | 30 | 28 | 36 | 35 | 35 | 34 | 32 | 29 | 27 | 0 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 41 | 40 | 38 | 33 | 29 | 25 | 22 | 20 | 30 | 30 | 29 | 28 | 25 | 23 | 0 | 0 | 25 | 25 | 24 | 24 | 0 | 0 | 0 | 0 |
| | 80 | 57 | 56 | 54 | 47 | 42 | 38 | 33 | 30 | 42 | 42 | 41 | 39 | 35 | 32 | 30 | 28 | 36 | 35 | 35 | 34 | 32 | 29 | 27 | 0 |

Note: The Length is based on use of 2 or more spans. Cantilevered ends may be used that are no greater than 1/3 of the backspan.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.5A Max Length L (inches) for Single Span Exterior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|-----|----|----|----|----|----|---------------------------|-----|-----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 60 | 47 | 32 | 23 | 17 | 0 | 0 | 0 | 41 | 41 | 30 | 23 | 0 | 0 | 0 | 0 | 33 | 33 | 29 | 22 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 61 | 46 | 31 | 22 | 17 | 0 | 0 | 0 | 44 | 41 | 29 | 22 | 0 | 0 | 0 | 0 | 36 | 36 | 28 | 22 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 122 | 92 | 63 | 45 | 34 | 28 | 23 | 20 | 94 | 83 | 59 | 45 | 34 | 28 | 23 | 20 | 76 | 75 | 57 | 44 | 34 | 28 | 23 | 20 | 20 |
| | 80 | 172 | 135 | 93 | 66 | 50 | 41 | 34 | 30 | 130 | 117 | 87 | 66 | 50 | 41 | 35 | 30 | 106 | 106 | 83 | 65 | 50 | 41 | 34 | 30 | 30 |
| | 44-X | 47 | 43 | 31 | 23 | 0 | 0 | 0 | 0 | 33 | 33 | 28 | 22 | 0 | 0 | 0 | 0 | 26 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 50 | 42 | 30 | 22 | 0 | 0 | 0 | 0 | 35 | 35 | 28 | 21 | 0 | 0 | 0 | 0 | 28 | 28 | 26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 104 | 85 | 60 | 45 | 34 | 28 | 23 | 20 | 74 | 74 | 56 | 43 | 34 | 28 | 23 | 20 | 61 | 61 | 53 | 42 | 34 | 28 | 23 | 20 | 20 |
| | 80 | 147 | 124 | 89 | 66 | 50 | 41 | 34 | 30 | 103 | 103 | 82 | 64 | 50 | 41 | 35 | 30 | 84 | 84 | 75 | 61 | 50 | 41 | 34 | 30 | 30 |
| | 44-X | 38 | 38 | 29 | 22 | 0 | 0 | 0 | 0 | 26 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 40 | 39 | 28 | 22 | 0 | 0 | 0 | 0 | 28 | 28 | 26 | 0 | 0 | 0 | 0 | 0 | 23 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 87 | 79 | 57 | 44 | 34 | 28 | 23 | 20 | 60 | 60 | 52 | 41 | 34 | 28 | 23 | 20 | 49 | 49 | 48 | 40 | 33 | 28 | 23 | 20 | 20 |
| | 80 | 120 | 113 | 84 | 65 | 50 | 41 | 34 | 30 | 84 | 84 | 75 | 60 | 50 | 41 | 35 | 30 | 69 | 69 | 68 | 58 | 48 | 41 | 34 | 30 | 30 |
| 110 | 44-X | 31 | 31 | 28 | 22 | 0 | 0 | 0 | 0 | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 18 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 33 | 33 | 27 | 21 | 0 | 0 | 0 | 0 | 23 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 71 | 71 | 54 | 42 | 34 | 28 | 23 | 20 | 50 | 50 | 49 | 39 | 33 | 28 | 23 | 20 | 41 | 41 | 41 | 37 | 31 | 27 | 23 | 20 | 20 |
| | 80 | 99 | 99 | 80 | 62 | 50 | 41 | 34 | 30 | 70 | 70 | 69 | 57 | 48 | 41 | 35 | 30 | 57 | 57 | 57 | 53 | 46 | 40 | 34 | 30 | 30 |
| | 44-X | 26 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 28 | 28 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 60 | 60 | 51 | 41 | 34 | 28 | 23 | 20 | 42 | 42 | 42 | 37 | 31 | 27 | 23 | 20 | 35 | 35 | 35 | 35 | 30 | 26 | 23 | 20 | 20 |
| | 80 | 83 | 83 | 75 | 60 | 49 | 41 | 34 | 30 | 59 | 59 | 59 | 54 | 46 | 39 | 35 | 30 | 48 | 48 | 48 | 48 | 43 | 38 | 33 | 30 | 30 |
| | 44-X | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 51 | 51 | 49 | 39 | 32 | 28 | 23 | 20 | 36 | 36 | 36 | 35 | 30 | 26 | 23 | 20 | 30 | 30 | 30 | 30 | 28 | 25 | 22 | 20 | 20 |
| | 80 | 71 | 71 | 69 | 57 | 48 | 41 | 34 | 30 | 50 | 50 | 50 | 44 | 38 | 33 | 30 | 41 | 41 | 41 | 41 | 40 | 36 | 32 | 29 | 29 | |
| 140 | 44-X | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 44 | 44 | 44 | 37 | 31 | 27 | 23 | 20 | 31 | 31 | 31 | 28 | 25 | 22 | 20 | 26 | 26 | 26 | 26 | 26 | 24 | 21 | 0 | 0 | |
| | 80 | 61 | 61 | 61 | 55 | 46 | 39 | 34 | 30 | 44 | 44 | 44 | 41 | 36 | 32 | 29 | 36 | 36 | 36 | 36 | 36 | 34 | 31 | 28 | 28 | |
| | 44-X | 0 | 31 | 28 | 22 | 0 | 0 | 0 | 0 | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 18 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 39 | 39 | 39 | 35 | 30 | 26 | 23 | 20 | 27 | 27 | 27 | 27 | 24 | 21 | 0 | 23 | 23 | 23 | 23 | 23 | 22 | 0 | 0 | 0 | |
| | 80 | 54 | 54 | 54 | 52 | 44 | 38 | 34 | 30 | 38 | 38 | 38 | 38 | 35 | 31 | 28 | 31 | 31 | 31 | 31 | 31 | 31 | 29 | 27 | 27 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 34 | 34 | 34 | 29 | 25 | 22 | 20 | 24 | 24 | 24 | 24 | 24 | 23 | 0 | 0 | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 | 0 |
| | 80 | 47 | 47 | 47 | 47 | 42 | 37 | 33 | 29 | 34 | 34 | 34 | 34 | 33 | 30 | 27 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 26 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 30 | 30 | 30 | 30 | 28 | 24 | 21 | 19 | 22 | 22 | 22 | 22 | 22 | 0 | 0 | 18 | 18 | 18 | 18 | 18 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 42 | 42 | 42 | 42 | 41 | 35 | 32 | 28 | 30 | 30 | 30 | 30 | 30 | 29 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |

Note: The Length is based on use of 2 or more spans. Cantilevered ends may be used that are no greater than 1/3 of the backspan.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 1.6 Maximum Downward Force (lbs) Single span only Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | 92 | 101 | 78 | 58 | 39 | 0 | 0 | 0 | 93 | 100 | 77 | 51 | 0 | 0 | 0 | 0 | 93 | 96 | 66 | 57 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 93 | 101 | 77 | 58 | 39 | 0 | 0 | 0 | 93 | 100 | 77 | 51 | 0 | 0 | 0 | 0 | 94 | 96 | 66 | 56 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 194 | 207 | 159 | 119 | 80 | 73 | 66 | 48 | 195 | 208 | 158 | 104 | 90 | 79 | 56 | 55 | 196 | 201 | 135 | 116 | 97 | 66 | 64 | 60 | 60 | |
| | 80 | 274 | 310 | 238 | 178 | 120 | 109 | 99 | 72 | 276 | 296 | 236 | 156 | 135 | 118 | 84 | 82 | 277 | 285 | 197 | 173 | 145 | 99 | 95 | 90 | 90 | |
| | 100 | 44-X | 93 | 102 | 81 | 65 | 0 | 0 | 0 | 93 | 97 | 81 | 53 | 0 | 0 | 0 | 0 | 94 | 95 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 93 | 101 | 80 | 65 | 0 | 0 | 0 | 0 | 94 | 98 | 81 | 53 | 0 | 0 | 0 | 0 | 94 | 95 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 195 | 208 | 166 | 134 | 86 | 80 | 73 | 52 | 196 | 204 | 166 | 109 | 99 | 87 | 61 | 61 | 197 | 200 | 150 | 121 | 107 | 79 | 70 | 67 | 67 | |
| | 80 | 276 | 304 | 248 | 200 | 129 | 120 | 110 | 78 | 277 | 289 | 246 | 163 | 148 | 130 | 91 | 91 | 278 | 282 | 214 | 181 | 161 | 118 | 105 | 100 | 100 | |
| | 110 | 44-X | 93 | 102 | 84 | 73 | 0 | 0 | 0 | 94 | 95 | 86 | 0 | 0 | 0 | 0 | 94 | 92 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 93 | 101 | 84 | 73 | 0 | 0 | 0 | 0 | 94 | 96 | 85 | 0 | 0 | 0 | 0 | 94 | 93 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 196 | 209 | 172 | 149 | 94 | 88 | 81 | 57 | 197 | 200 | 176 | 117 | 108 | 97 | 67 | 67 | 197 | 194 | 162 | 132 | 114 | 93 | 78 | 75 | 75 | |
| | 80 | 277 | 298 | 257 | 223 | 140 | 132 | 122 | 85 | 278 | 283 | 254 | 175 | 161 | 145 | 100 | 100 | 279 | 274 | 229 | 193 | 170 | 139 | 117 | 112 | 112 | |
| | 120 | 44-X | 93 | 102 | 89 | 78 | 0 | 0 | 0 | 94 | 93 | 88 | 0 | 0 | 0 | 0 | 92 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 94 | 102 | 88 | 78 | 0 | 0 | 0 | 0 | 94 | 93 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 196 | 207 | 181 | 161 | 102 | 97 | 90 | 62 | 197 | 194 | 185 | 129 | 113 | 107 | 77 | 74 | 198 | 193 | 171 | 145 | 122 | 105 | 91 | 83 | 83 | |
| 120 | 80 | 277 | 293 | 270 | 240 | 152 | 145 | 135 | 93 | 279 | 275 | 261 | 192 | 170 | 160 | 116 | 111 | 279 | 273 | 242 | 208 | 182 | 157 | 136 | 124 | 124 | |
| | 44-X | 94 | 103 | 93 | 0 | 0 | 0 | 0 | 0 | 92 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 94 | 102 | 93 | 0 | 0 | 0 | 0 | 0 | 94 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 197 | 204 | 191 | 172 | 108 | 107 | 99 | 67 | 197 | 193 | 189 | 141 | 119 | 114 | 89 | 82 | 198 | 194 | 180 | 156 | 133 | 116 | 102 | 92 | 92 | |
| | 80 | 278 | 288 | 279 | 258 | 162 | 159 | 149 | 101 | 279 | 273 | 268 | 205 | 178 | 170 | 133 | 122 | 280 | 274 | 254 | 221 | 195 | 173 | 153 | 138 | 138 | |
| 130 | 44-X | 94 | 98 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 94 | 102 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 197 | 204 | 191 | 172 | 108 | 107 | 99 | 67 | 197 | 193 | 189 | 141 | 119 | 114 | 89 | 82 | 198 | 194 | 180 | 156 | 133 | 116 | 102 | 92 | 92 | |
| | 80 | 279 | 288 | 279 | 258 | 162 | 159 | 149 | 101 | 279 | 273 | 268 | 205 | 178 | 170 | 133 | 122 | 280 | 274 | 254 | 221 | 195 | 173 | 153 | 138 | 138 | |
| | 140 | 44-X | 94 | 98 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-X | 94 | 102 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 197 | 196 | 200 | 184 | 113 | 117 | 110 | 73 | 198 | 194 | 194 | 152 | 129 | 121 | 98 | 90 | 198 | 195 | 187 | 165 | 145 | 127 | 112 | 101 | 101 | |
| | 80 | 279 | 277 | 287 | 275 | 169 | 174 | 164 | 110 | 280 | 274 | 274 | 217 | 192 | 181 | 147 | 134 | 280 | 275 | 265 | 233 | 208 | 187 | 168 | 151 | 151 | |
| | 150 | 44-X | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 94 | 102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 197 | 193 | 208 | 195 | 118 | 123 | 121 | 79 | 198 | 194 | 198 | 162 | 139 | 127 | 108 | 97 | 198 | 195 | 191 | 173 | 155 | 138 | 123 | 0 | 0 | |
| | 80 | 279 | 272 | 294 | 289 | 176 | 185 | 181 | 119 | 280 | 275 | 279 | 229 | 203 | 191 | 161 | 145 | 281 | 276 | 270 | 244 | 219 | 199 | 183 | 166 | 0 | |
| | 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 198 | 193 | 213 | 205 | 123 | 130 | 129 | 86 | 198 | 195 | 200 | 169 | 149 | 134 | 117 | 0 | 199 | 196 | 192 | 180 | 163 | 148 | 0 | 0 | 0 | |
| 170 | 80 | 279 | 273 | 301 | 300 | 184 | 195 | 194 | 129 | 280 | 276 | 283 | 239 | 214 | 199 | 175 | 157 | 281 | 277 | 271 | 254 | 230 | 211 | 194 | 180 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 198 | 194 | 217 | 216 | 132 | 137 | 137 | 92 | 199 | 196 | 198 | 176 | 159 | 141 | 0 | 0 | 199 | 196 | 193 | 186 | 170 | 0 | 0 | 0 | 0 | |
| | 80 | 280 | 274 | 307 | 311 | 197 | 205 | 205 | 138 | 281 | 277 | 280 | 249 | 225 | 205 | 188 | 170 | 281 | 278 | 273 | 263 | 240 | 221 | 205 | 190 | 190 | |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 198 | 195 | 222 | 226 | 140 | 144 | 145 | 98 | 199 | 196 | 197 | 182 | 166 | 149 | 0 | 0 | 199 | 197 | 193 | 190 | 0 | 0 | 0 | 0 | 0 | |
| 180 | 80 | 280 | 275 | 313 | 321 | 207 | 215 | 217 | 147 | 281 | 277 | 278 | 258 | 234 | 215 | 198 | 183 | 281 | 278 | 274 | 269 | 250 | 231 | 215 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.6A Maximum Downward Force (lbs) Single span only Exterior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 92 | 101 | 78 | 58 | 39 | 0 | 0 | 0 | 81 | 99 | 77 | 51 | 0 | 0 | 0 | 0 | 76 | 86 | 66 | 57 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 93 | 99 | 76 | 57 | 38 | 0 | 0 | 0 | 86 | 100 | 75 | 50 | 0 | 0 | 0 | 0 | 81 | 91 | 64 | 55 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 187 | 199 | 153 | 115 | 77 | 70 | 64 | 46 | 185 | 200 | 152 | 100 | 87 | 76 | 54 | 53 | 174 | 194 | 130 | 111 | 93 | 64 | 61 | 58 | |
| | 80 | 263 | 293 | 225 | 169 | 113 | 103 | 94 | 68 | 257 | 283 | 223 | 147 | 127 | 111 | 79 | 78 | 242 | 272 | 189 | 164 | 137 | 94 | 90 | 85 | |
| | 44-X | 84 | 102 | 81 | 65 | 0 | 0 | 0 | 0 | 76 | 86 | 81 | 53 | 0 | 0 | 0 | 0 | 72 | 76 | 72 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 90 | 99 | 79 | 64 | 0 | 0 | 0 | 0 | 81 | 92 | 80 | 52 | 0 | 0 | 0 | 0 | 77 | 81 | 72 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 187 | 200 | 159 | 129 | 83 | 77 | 71 | 50 | 173 | 196 | 160 | 105 | 95 | 84 | 1327 | 58 | 165 | 174 | 144 | 116 | 103 | 76 | 68 | 64 | |
| | 80 | 264 | 291 | 234 | 189 | 122 | 113 | 104 | 74 | 241 | 273 | 235 | 154 | 140 | 123 | 1951 | 86 | 229 | 242 | 205 | 171 | 152 | 112 | 100 | 95 | |
| | 44-X | 79 | 96 | 84 | 73 | 0 | 0 | 0 | 0 | 72 | 76 | 86 | 0 | 0 | 0 | 0 | 0 | 69 | 70 | 69 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 84 | 100 | 82 | 71 | 0 | 0 | 0 | 0 | 77 | 81 | 84 | 0 | 0 | 0 | 0 | 0 | 74 | 75 | 74 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 180 | 201 | 165 | 143 | 90 | 85 | 78 | 55 | 165 | 175 | 169 | 112 | 104 | 93 | 1369 | 64 | 159 | 160 | 155 | 127 | 109 | 89 | 75 | 72 | |
| | 80 | 250 | 285 | 243 | 211 | 133 | 125 | 115 | 80 | 229 | 242 | 243 | 165 | 152 | 137 | 2013 | 95 | 220 | 222 | 219 | 185 | 161 | 131 | 111 | 106 | |
| | 44-X | 75 | 85 | 89 | 78 | 0 | 0 | 0 | 0 | 70 | 70 | 80 | 0 | 0 | 0 | 0 | 0 | 67 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 80 | 91 | 87 | 77 | 0 | 0 | 0 | 0 | 74 | 75 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 172 | 195 | 174 | 155 | 98 | 93 | 87 | 60 | 159 | 161 | 178 | 124 | 109 | 103 | 1415 | 71 | 154 | 154 | 154 | 140 | 117 | 101 | 88 | 80 | |
| 120 | 80 | 238 | 271 | 256 | 227 | 144 | 137 | 127 | 88 | 221 | 224 | 250 | 182 | 160 | 151 | 2081 | 105 | 213 | 213 | 199 | 172 | 148 | 129 | 117 | | |
| | 44-X | 72 | 77 | 93 | 0 | 0 | 0 | 0 | 68 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 77 | 83 | 91 | 0 | 0 | 0 | 0 | 72 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 165 | 177 | 183 | 166 | 104 | 102 | 96 | 65 | 155 | 155 | 173 | 135 | 115 | 110 | 1465 | 78 | 150 | 150 | 150 | 150 | 128 | 111 | 98 | 89 | |
| | 80 | 229 | 246 | 267 | 243 | 153 | 151 | 141 | 95 | 215 | 215 | 240 | 197 | 168 | 161 | 2154 | 115 | 208 | 208 | 208 | 187 | 164 | 144 | 130 | | |
| 130 | 44-X | 70 | 71 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 75 | 76 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 160 | 163 | 192 | 176 | 109 | 112 | 105 | 70 | 151 | 151 | 165 | 146 | 124 | 116 | 1470 | 86 | 147 | 147 | 147 | 147 | 140 | 122 | 108 | 97 | |
| | 80 | 222 | 227 | 275 | 259 | 160 | 165 | 155 | 103 | 210 | 210 | 229 | 208 | 182 | 171 | 2161 | 127 | 204 | 204 | 204 | 204 | 199 | 179 | 159 | 143 | |
| | 44-X | 68 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-X | 73 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 156 | 156 | 193 | 187 | 113 | 119 | 116 | 76 | 148 | 148 | 158 | 148 | 134 | 123 | 1472 | 93 | 145 | 145 | 145 | 145 | 145 | 132 | 118 | 0 | |
| | 80 | 216 | 216 | 268 | 275 | 167 | 174 | 171 | 112 | 206 | 206 | 220 | 206 | 195 | 180 | 2164 | 137 | 201 | 201 | 201 | 201 | 191 | 173 | 156 | | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 152 | 152 | 186 | 198 | 118 | 125 | 124 | 83 | 146 | 146 | 153 | 146 | 143 | 129 | 1473 | 0 | 143 | 143 | 143 | 143 | 142 | 0 | 0 | | |
| | 80 | 211 | 211 | 258 | 288 | 174 | 184 | 183 | 122 | 202 | 202 | 213 | 202 | 202 | 190 | 2166 | 149 | 198 | 198 | 198 | 198 | 198 | 186 | 170 | | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 150 | 150 | 180 | 208 | 126 | 132 | 132 | 88 | 144 | 144 | 149 | 144 | 144 | 135 | 0 | 0 | 141 | 141 | 141 | 141 | 141 | 0 | 0 | 0 | |
| 170 | 80 | 208 | 208 | 250 | 291 | 186 | 194 | 194 | 130 | 200 | 200 | 207 | 200 | 200 | 196 | 2169 | 161 | 196 | 196 | 196 | 196 | 196 | 196 | 183 | | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 147 | 147 | 175 | 204 | 135 | 138 | 140 | 94 | 142 | 142 | 146 | 142 | 142 | 142 | 0 | 0 | 140 | 140 | 140 | 140 | 140 | 0 | 0 | 0 | |
| | 80 | 205 | 205 | 243 | 283 | 198 | 203 | 205 | 139 | 198 | 198 | 202 | 198 | 198 | 198 | 2168 | 173 | 195 | 195 | 195 | 195 | 195 | 195 | 195 | | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 1.7 Maximum Horizontal Force (lbs) Single span only Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|----|----|----|----|----|---------------------------|-----|-----|-----|-----|----|----|---------------------------|-----|-----|-----|-----|-----|-----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 |
| 90 | 44-X | 31 | 24 | 17 | 12 | 9 | 0 | 0 | 0 | 34 | 30 | 22 | 16 | 9 | 0 | 0 | 0 | 39 | 33 | 25 | 20 | 11 | 0 | 0 | 0 |
| | 48-X | 32 | 24 | 17 | 12 | 9 | 0 | 0 | 0 | 34 | 30 | 22 | 16 | 9 | 0 | 0 | 0 | 40 | 33 | 25 | 19 | 11 | 0 | 0 | 0 |
| | 48-XL | 66 | 50 | 34 | 24 | 19 | 15 | 13 | 11 | 72 | 62 | 44 | 34 | 26 | 21 | 18 | 15 | 83 | 68 | 51 | 40 | 31 | 25 | 21 | 18 |
| | 80 | 93 | 74 | 51 | 36 | 28 | 23 | 19 | 16 | 102 | 88 | 66 | 50 | 39 | 31 | 26 | 23 | 117 | 97 | 75 | 60 | 47 | 38 | 32 | 27 |
| | 44-X | 33 | 28 | 20 | 15 | 0 | 0 | 0 | 0 | 36 | 33 | 25 | 20 | 0 | 0 | 0 | 0 | 42 | 36 | 28 | 18 | 0 | 0 | 0 | 0 |
| | 48-X | 33 | 28 | 20 | 15 | 0 | 0 | 0 | 0 | 36 | 33 | 25 | 19 | 0 | 0 | 0 | 0 | 42 | 36 | 29 | 18 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 70 | 57 | 40 | 30 | 23 | 19 | 16 | 14 | 75 | 69 | 52 | 40 | 32 | 26 | 22 | 19 | 88 | 75 | 59 | 47 | 38 | 31 | 26 | 23 |
| | 80 | 99 | 83 | 60 | 45 | 34 | 28 | 23 | 20 | 106 | 98 | 76 | 60 | 48 | 39 | 33 | 28 | 124 | 106 | 84 | 70 | 57 | 47 | 39 | 34 |
| | 44-X | 35 | 31 | 23 | 17 | 0 | 0 | 0 | 0 | 37 | 36 | 28 | 18 | 0 | 0 | 0 | 0 | 44 | 39 | 31 | 22 | 0 | 0 | 0 | 0 |
| | 48-X | 35 | 31 | 23 | 17 | 0 | 0 | 0 | 0 | 37 | 36 | 28 | 18 | 0 | 0 | 0 | 0 | 44 | 39 | 31 | 22 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 73 | 64 | 46 | 36 | 28 | 23 | 19 | 16 | 78 | 75 | 59 | 46 | 38 | 31 | 26 | 23 | 92 | 81 | 66 | 54 | 44 | 38 | 32 | 27 |
| | 80 | 103 | 92 | 69 | 54 | 41 | 34 | 28 | 24 | 110 | 106 | 84 | 69 | 57 | 47 | 39 | 34 | 130 | 115 | 93 | 78 | 66 | 56 | 47 | 41 |
| | 44-X | 36 | 35 | 26 | 20 | 0 | 0 | 0 | 0 | 38 | 37 | 31 | 21 | 0 | 0 | 0 | 0 | 45 | 44 | 32 | 25 | 0 | 0 | 0 | 0 |
| | 48-X | 36 | 35 | 25 | 20 | 0 | 0 | 0 | 0 | 38 | 37 | 31 | 21 | 0 | 0 | 0 | 0 | 45 | 43 | 32 | 25 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 76 | 70 | 52 | 41 | 33 | 27 | 23 | 19 | 80 | 78 | 65 | 52 | 43 | 37 | 31 | 27 | 95 | 88 | 71 | 60 | 50 | 43 | 38 | 33 |
| | 80 | 107 | 99 | 78 | 61 | 49 | 40 | 34 | 29 | 113 | 110 | 92 | 78 | 65 | 56 | 47 | 40 | 134 | 125 | 100 | 86 | 75 | 65 | 57 | 49 |
| | 44-X | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| | 48-X | 37 | 38 | 28 | 0 | 0 | 0 | 0 | 0 | 39 | 39 | 29 | 0 | 0 | 0 | 0 | 0 | 47 | 47 | 35 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-XL | 78 | 75 | 58 | 46 | 38 | 31 | 26 | 23 | 82 | 80 | 70 | 58 | 49 | 42 | 37 | 32 | 98 | 94 | 76 | 66 | 56 | 49 | 43 | 38 |
| | 80 | 110 | 106 | 85 | 69 | 57 | 47 | 40 | 34 | 115 | 113 | 99 | 85 | 73 | 63 | 55 | 47 | 138 | 133 | 107 | 93 | 82 | 73 | 64 | 57 |
| | 44-X | 38 | 39 | 31 | 0 | 0 | 0 | 0 | 0 | 39 | 40 | 32 | 0 | 0 | 0 | 0 | 0 | 48 | 49 | 39 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 38 | 40 | 31 | 0 | 0 | 0 | 0 | 0 | 40 | 42 | 32 | 0 | 0 | 0 | 0 | 0 | 48 | 51 | 39 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 80 | 77 | 64 | 51 | 42 | 36 | 31 | 26 | 83 | 81 | 75 | 64 | 54 | 47 | 41 | 37 | 100 | 97 | 80 | 70 | 62 | 54 | 48 | 43 |
| | 80 | 113 | 110 | 91 | 76 | 63 | 54 | 46 | 40 | 117 | 115 | 105 | 91 | 80 | 70 | 62 | 55 | 141 | 138 | 115 | 99 | 89 | 80 | 72 | 65 |
| | 44-X | 38 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 48 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 39 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 53 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 81 | 79 | 69 | 56 | 47 | 40 | 35 | 30 | 84 | 83 | 79 | 69 | 59 | 52 | 46 | 41 | 102 | 100 | 86 | 74 | 67 | 59 | 53 | 38 |
| | 80 | 115 | 112 | 97 | 83 | 70 | 60 | 53 | 45 | 119 | 117 | 111 | 97 | 86 | 77 | 68 | 62 | 144 | 141 | 122 | 105 | 95 | 86 | 79 | 71 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 82 | 81 | 73 | 61 | 51 | 44 | 39 | 35 | 86 | 84 | 82 | 73 | 64 | 56 | 50 | 36 | 104 | 101 | 91 | 78 | 71 | 64 | 49 | 43 |
| | 80 | 117 | 114 | 103 | 89 | 77 | 66 | 59 | 52 | 121 | 119 | 116 | 103 | 92 | 83 | 75 | 68 | 147 | 143 | 129 | 111 | 100 | 92 | 84 | 78 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 84 | 82 | 76 | 65 | 56 | 48 | 43 | 38 | 87 | 85 | 83 | 76 | 69 | 61 | 45 | 40 | 105 | 103 | 96 | 82 | 75 | 61 | 54 | 48 |
| | 80 | 118 | 116 | 108 | 94 | 83 | 72 | 64 | 58 | 123 | 121 | 117 | 108 | 97 | 89 | 82 | 74 | 149 | 146 | 136 | 118 | 105 | 97 | 90 | 84 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 85 | 83 | 80 | 70 | 60 | 52 | 47 | 42 | 88 | 86 | 84 | 80 | 72 | 65 | 48 | 44 | 106 | 104 | 100 | 88 | 75 | 66 | 58 | 53 |
| | 80 | 119 | 117 | 113 | 99 | 88 | 78 | 70 | 63 | 124 | 122 | 119 | 113 | 102 | 94 | 87 | 80 | 150 | 148 | 142 | 124 | 111 | 102 | 95 | 79 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 1.7A Maximum Horizontal Force (lbs) Single span only Exterior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|---------------------------|-----|-----|-----|-----|-----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 |
| 90 | 44-X | 31 | 24 | 17 | 12 | 9 | 0 | 0 | 0 | 32 | 30 | 22 | 16 | 9 | 0 | 0 | 0 | 39 | 30 | 25 | 20 | 11 | 0 | 0 | 0 |
| | 48-X | 32 | 24 | 16 | 12 | 9 | 0 | 0 | 0 | 33 | 30 | 21 | 16 | 9 | 0 | 0 | 0 | 40 | 31 | 25 | 19 | 11 | 0 | 0 | 0 |
| | 48-XL | 63 | 48 | 33 | 23 | 18 | 14 | 12 | 11 | 68 | 60 | 43 | 32 | 25 | 20 | 17 | 15 | 80 | 66 | 49 | 38 | 30 | 24 | 20 | 18 |
| | 80 | 89 | 70 | 49 | 34 | 26 | 21 | 18 | 15 | 94 | 85 | 63 | 47 | 36 | 30 | 25 | 21 | 112 | 92 | 72 | 57 | 44 | 36 | 30 | 26 |
| 100 | 44-X | 30 | 28 | 20 | 15 | 0 | 0 | 0 | 0 | 31 | 29 | 25 | 20 | 0 | 0 | 0 | 0 | 38 | 35 | 28 | 18 | 0 | 0 | 0 | 0 |
| | 48-X | 32 | 27 | 19 | 14 | 0 | 0 | 0 | 0 | 33 | 31 | 25 | 19 | 0 | 0 | 0 | 0 | 40 | 34 | 28 | 18 | 0 | 0 | 0 | 0 |
| | 48-XL | 67 | 55 | 39 | 29 | 22 | 18 | 15 | 13 | 70 | 66 | 50 | 39 | 31 | 25 | 21 | 18 | 84 | 69 | 57 | 45 | 37 | 30 | 25 | 22 |
| | 80 | 95 | 80 | 57 | 42 | 32 | 26 | 22 | 19 | 98 | 92 | 73 | 57 | 45 | 36 | 31 | 26 | 119 | 100 | 81 | 66 | 54 | 44 | 37 | 32 |
| 110 | 44-X | 29 | 29 | 23 | 17 | 0 | 0 | 0 | 0 | 31 | 31 | 28 | 18 | 0 | 0 | 0 | 0 | 37 | 37 | 28 | 22 | 0 | 0 | 0 | 0 |
| | 48-X | 31 | 31 | 22 | 17 | 0 | 0 | 0 | 0 | 33 | 32 | 28 | 18 | 0 | 0 | 0 | 0 | 39 | 39 | 30 | 22 | 0 | 0 | 0 | 0 |
| | 48-XL | 67 | 62 | 45 | 34 | 27 | 22 | 18 | 16 | 70 | 65 | 56 | 44 | 37 | 30 | 25 | 22 | 85 | 78 | 63 | 52 | 43 | 36 | 31 | 26 |
| | 80 | 93 | 88 | 66 | 51 | 39 | 32 | 27 | 23 | 97 | 91 | 81 | 65 | 54 | 44 | 37 | 32 | 117 | 110 | 89 | 75 | 63 | 53 | 45 | 39 |
| 120 | 44-X | 29 | 29 | 26 | 20 | 0 | 0 | 0 | 0 | 30 | 30 | 28 | 21 | 0 | 0 | 0 | 0 | 36 | 36 | 32 | 25 | 0 | 0 | 0 | 0 |
| | 48-X | 31 | 31 | 25 | 20 | 0 | 0 | 0 | 0 | 32 | 32 | 30 | 20 | 0 | 0 | 0 | 0 | 39 | 39 | 31 | 25 | 0 | 0 | 0 | 0 |
| | 48-XL | 66 | 66 | 50 | 39 | 32 | 26 | 22 | 19 | 69 | 69 | 63 | 50 | 42 | 36 | 30 | 26 | 83 | 83 | 64 | 58 | 48 | 42 | 36 | 31 |
| | 80 | 92 | 92 | 74 | 58 | 47 | 38 | 32 | 27 | 96 | 96 | 88 | 74 | 61 | 53 | 44 | 38 | 115 | 115 | 93 | 82 | 71 | 61 | 53 | 46 |
| 130 | 44-X | 29 | 29 | 28 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 29 | 0 | 0 | 0 | 0 | 0 | 36 | 36 | 36 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 30 | 30 | 28 | 0 | 0 | 0 | 0 | 0 | 32 | 32 | 29 | 0 | 0 | 0 | 0 | 0 | 38 | 38 | 35 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 65 | 65 | 56 | 44 | 37 | 30 | 25 | 22 | 68 | 68 | 64 | 56 | 47 | 40 | 35 | 30 | 82 | 82 | 70 | 63 | 54 | 47 | 41 | 37 |
| | 80 | 91 | 91 | 81 | 65 | 54 | 44 | 37 | 32 | 94 | 94 | 89 | 81 | 69 | 59 | 52 | 45 | 114 | 114 | 102 | 88 | 79 | 69 | 61 | 54 |
| 140 | 44-X | 28 | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 35 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 31 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 38 | 38 | 38 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 65 | 65 | 61 | 49 | 41 | 35 | 29 | 25 | 67 | 67 | 64 | 61 | 52 | 45 | 40 | 35 | 81 | 81 | 77 | 63 | 60 | 52 | 46 | 41 |
| | 80 | 90 | 90 | 87 | 72 | 60 | 51 | 43 | 37 | 93 | 93 | 91 | 87 | 76 | 66 | 58 | 52 | 113 | 113 | 110 | 90 | 85 | 77 | 68 | 61 |
| 150 | 44-X | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 38 | 38 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 64 | 64 | 64 | 54 | 45 | 39 | 34 | 29 | 67 | 67 | 63 | 57 | 50 | 44 | 40 | 38 | 80 | 80 | 80 | 67 | 63 | 57 | 51 | 37 |
| | 80 | 89 | 89 | 89 | 79 | 66 | 57 | 50 | 43 | 92 | 92 | 87 | 83 | 73 | 65 | 58 | 112 | 112 | 112 | 99 | 87 | 82 | 75 | 68 | |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 64 | 64 | 64 | 58 | 49 | 43 | 38 | 33 | 66 | 66 | 66 | 63 | 62 | 54 | 48 | 35 | 80 | 80 | 80 | 73 | 62 | 47 | 42 | |
| | 80 | 88 | 88 | 88 | 85 | 72 | 63 | 55 | 49 | 92 | 92 | 88 | 87 | 80 | 71 | 64 | 111 | 111 | 111 | 107 | 91 | 86 | 81 | 74 | |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 63 | 63 | 63 | 53 | 47 | 41 | 37 | 32 | 66 | 66 | 66 | 65 | 62 | 59 | 43 | 38 | 79 | 79 | 79 | 79 | 67 | 58 | 52 | 46 |
| | 80 | 88 | 88 | 88 | 88 | 79 | 68 | 61 | 54 | 91 | 91 | 91 | 91 | 87 | 85 | 77 | 70 | 110 | 110 | 110 | 110 | 99 | 86 | 86 | 80 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 63 | 63 | 63 | 57 | 50 | 45 | 40 | 65 | 65 | 65 | 65 | 62 | 47 | 42 | 42 | 79 | 79 | 79 | 79 | 72 | 63 | 56 | 51 | |
| | 80 | 87 | 87 | 87 | 87 | 84 | 74 | 66 | 59 | 91 | 91 | 91 | 91 | 88 | 86 | 83 | 75 | 110 | 110 | 110 | 110 | 106 | 93 | 86 | 74 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.8 Max Uplift Force (lbs) Single span only Interior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | -52 | -40 | -28 | -20 | -15 | 0 | 0 | 0 | -97 | -54 | -39 | -29 | 0 | 0 | 0 | 0 | -66 | -61 | -47 | -36 | 0 | 0 | 0 | 0 | |
| | | -52 | -40 | -28 | -20 | -15 | 0 | 0 | 0 | -97 | -54 | -39 | -29 | 0 | 0 | 0 | 0 | -66 | -61 | -46 | -36 | 0 | 0 | 0 | 0 | |
| | | -110 | -83 | -57 | -40 | -31 | -25 | -21 | -18 | -204 | -112 | -80 | -60 | -46 | -38 | -32 | -27 | -139 | -127 | -96 | -74 | -58 | -47 | -39 | -34 | |
| | | 80 | -155 | -124 | -86 | -60 | -46 | -38 | -32 | -27 | -288 | -159 | -119 | -90 | -69 | -56 | -47 | -41 | -196 | -180 | -140 | -111 | -87 | -70 | -59 | -51 |
| | | -58 | -49 | -35 | -26 | 0 | 0 | 0 | 0 | -82 | -61 | -47 | -36 | 0 | 0 | 0 | 0 | -71 | -68 | -54 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | -59 | -49 | -34 | -25 | 0 | 0 | 0 | 0 | -83 | -62 | -47 | -36 | 0 | 0 | 0 | 0 | -71 | -68 | -55 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -123 | -100 | -71 | -52 | -40 | -33 | -27 | -24 | -173 | -129 | -96 | -75 | -59 | -48 | -41 | -35 | -149 | -143 | -113 | -90 | -73 | -60 | -50 | -43 | -43 |
| | | 80 | -173 | -146 | -106 | -78 | -60 | -49 | -41 | -35 | -244 | -182 | -142 | -112 | -89 | -72 | -61 | -52 | -210 | -202 | -161 | -134 | -110 | -89 | -75 | -65 |
| | | -63 | -57 | -41 | -32 | 0 | 0 | 0 | 0 | -71 | -68 | -54 | 0 | 0 | 0 | 0 | 0 | -74 | -73 | -61 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -64 | -57 | -41 | -32 | 0 | 0 | 0 | 0 | -71 | -68 | -54 | 0 | 0 | 0 | 0 | 0 | -75 | -73 | -61 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | -133 | -117 | -85 | -65 | -51 | -41 | -35 | -30 | -149 | -143 | -112 | -88 | -73 | -60 | -50 | -43 | -156 | -152 | -128 | -105 | -87 | -74 | -62 | -53 | -53 |
| | | 80 | -188 | -167 | -126 | -98 | -76 | -61 | -52 | -45 | -210 | -202 | -162 | -132 | -109 | -89 | -75 | -65 | -221 | -215 | -181 | -153 | -130 | -110 | -93 | -80 |
| | | -68 | -65 | -48 | -37 | 0 | 0 | 0 | 0 | -74 | -72 | -61 | 0 | 0 | 0 | 0 | 0 | -75 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -68 | -65 | -48 | -37 | 0 | 0 | 0 | 0 | -74 | -72 | -61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -142 | -132 | -98 | -77 | -62 | -50 | -42 | -36 | -156 | -152 | -127 | -102 | -85 | -72 | -61 | -53 | -162 | -159 | -141 | -120 | -100 | -86 | -75 | -65 | |
| 120 | 48-XL | 80 | -200 | -186 | -146 | -115 | -93 | -75 | -63 | -55 | -220 | -214 | -180 | -152 | -127 | -108 | -92 | -79 | -230 | -224 | -199 | -171 | -149 | -129 | -112 | -97 |
| | | -71 | -72 | -54 | 0 | 0 | 0 | 0 | 0 | -75 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -71 | -72 | -54 | 0 | 0 | 0 | 0 | 0 | -77 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -149 | -144 | -111 | -88 | -73 | -60 | -51 | -44 | -161 | -158 | -139 | -115 | -96 | -83 | -73 | -63 | -167 | -164 | -152 | -132 | -113 | -98 | -86 | -77 | |
| | | 80 | -211 | -203 | -162 | -132 | -109 | -90 | -76 | -65 | -228 | -223 | -196 | -168 | -144 | -124 | -109 | -94 | -237 | -232 | -215 | -187 | -165 | -147 | -129 | -115 |
| 130 | 48-XL | -74 | -75 | -60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -74 | -79 | -60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -155 | -151 | -124 | -99 | -83 | -71 | -60 | -52 | -166 | -163 | -149 | -128 | -108 | -94 | -83 | -73 | -63 | -171 | -168 | -162 | -143 | -126 | -110 | -97 | -87 |
| | | 80 | -219 | -213 | -178 | -148 | -124 | -106 | -89 | -77 | -235 | -230 | -211 | -183 | -161 | -140 | -124 | -110 | -242 | -238 | -229 | -201 | -180 | -162 | -146 | -131 |
| | | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | -76 | -83 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -160 | -156 | -136 | -110 | -92 | -80 | -69 | -60 | -170 | -167 | -159 | -139 | -119 | -104 | -92 | -83 | -175 | -172 | -168 | -152 | -137 | -121 | -108 | 0 | |
| | | 80 | -226 | -221 | -192 | -164 | -138 | -119 | -104 | -90 | -241 | -236 | -224 | -196 | -175 | -156 | -138 | -124 | -247 | -243 | -238 | -215 | -193 | -176 | -161 | -146 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -164 | -161 | -145 | -121 | -102 | -88 | -78 | -69 | -173 | -171 | -167 | -148 | -130 | -115 | -102 | 0 | -178 | -175 | -172 | -161 | -146 | -132 | 0 | 0 | |
| 160 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -168 | -165 | -153 | -131 | -112 | -97 | -86 | -77 | -176 | -174 | -170 | -156 | -141 | -125 | 0 | 0 | -180 | -178 | -175 | -169 | -154 | 0 | 0 | 0 | |
| | | 80 | -237 | -233 | -217 | -189 | -167 | -145 | -129 | -116 | -249 | -246 | -240 | -221 | -199 | -182 | -167 | -151 | -255 | -252 | -247 | -239 | -218 | -200 | -185 | -173 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -171 | -168 | -161 | -141 | -121 | -106 | -94 | -85 | -179 | -176 | -173 | -164 | -149 | -134 | 0 | 0 | -182 | -180 | -177 | -174 | 0 | 0 | 0 | 0 | |
| | | 80 | -242 | -238 | -228 | -200 | -178 | -158 | -141 | -127 | -253 | -249 | -244 | -232 | -211 | -193 | -178 | -164 | -258 | -255 | -250 | -246 | -228 | -211 | -197 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 1.8A Max Uplift Force (lbs) Single span only Exterior Conditions

| Exp B | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | -52 | -40 | -28 | -20 | -15 | 0 | 0 | 0 | -53 | -53 | -39 | -29 | 0 | 0 | 0 | 0 | -54 | -54 | -47 | -36 | 0 | 0 | 0 | 0 | 0 |
| | | -52 | -40 | -27 | -19 | -15 | 0 | 0 | 0 | -57 | -54 | -38 | -29 | 0 | 0 | 0 | 0 | -58 | -58 | -46 | -36 | 0 | 0 | 0 | 0 | 0 |
| | | -106 | -79 | -55 | -39 | -30 | -24 | -20 | -18 | -122 | -108 | -77 | -58 | -45 | -36 | -31 | -26 | -124 | -122 | -92 | -72 | -56 | -45 | -38 | -33 | -33 |
| | | 80 | -149 | -117 | -81 | -57 | -44 | -35 | -30 | -26 | -170 | -152 | -113 | -85 | -65 | -53 | -45 | -39 | -172 | -172 | -134 | -105 | -82 | -66 | -56 | -48 |
| | | -53 | -49 | -35 | -26 | 0 | 0 | 0 | 0 | -54 | -54 | -47 | -36 | 0 | 0 | 0 | 0 | -55 | -55 | -54 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | -56 | -48 | -34 | -25 | 0 | 0 | 0 | 0 | -58 | -58 | -46 | -36 | 0 | 0 | 0 | 0 | -58 | -58 | -54 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -118 | -96 | -68 | -50 | -39 | -31 | -26 | -23 | -124 | -124 | -92 | -72 | -57 | -46 | -39 | -34 | -125 | -125 | -109 | -86 | -71 | -57 | -48 | -42 | -42 |
| | | 80 | -166 | -140 | -100 | -74 | -57 | -46 | -39 | -34 | -172 | -172 | -136 | -106 | -84 | -68 | -57 | -49 | -173 | -173 | -155 | -127 | -104 | -84 | -71 | -61 |
| | | -54 | -54 | -41 | -32 | 0 | 0 | 0 | 0 | -55 | -55 | -54 | 0 | 0 | 0 | 0 | -55 | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -57 | -56 | -40 | -31 | 0 | 0 | 0 | 0 | -58 | -58 | -54 | 0 | 0 | 0 | 0 | -59 | -59 | -59 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 110 | 48-XL | -123 | -113 | -81 | -63 | -49 | -39 | -33 | -29 | -125 | -125 | -108 | -85 | -70 | -57 | -48 | -42 | -126 | -126 | -123 | -101 | -83 | -71 | -60 | -51 | -51 |
| | | 80 | -170 | -160 | -119 | -92 | -71 | -58 | -49 | -42 | -173 | -173 | -155 | -125 | -103 | -84 | -71 | -61 | -175 | -175 | -174 | -147 | -123 | -104 | -88 | -76 |
| | | -54 | -54 | -48 | -37 | 0 | 0 | 0 | 0 | -55 | -55 | -55 | 0 | 0 | 0 | 0 | -55 | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -58 | -58 | -47 | -37 | 0 | 0 | 0 | 0 | -59 | -59 | -59 | 0 | 0 | 0 | 0 | -59 | -59 | -59 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -124 | -124 | -94 | -74 | -59 | -48 | -41 | -35 | -126 | -126 | -122 | -98 | -81 | -70 | -59 | -51 | -126 | -126 | -126 | -115 | -96 | -83 | -72 | -62 | |
| 120 | 48-XL | 80 | -172 | -172 | -139 | -108 | -87 | -71 | -60 | -52 | -174 | -174 | -172 | -144 | -120 | -102 | -87 | -74 | -175 | -175 | -163 | -141 | -122 | -106 | -91 | -91 |
| | | -55 | -55 | -54 | 0 | 0 | 0 | 0 | 0 | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -58 | -58 | -53 | 0 | 0 | 0 | 0 | 0 | -59 | -59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -125 | -125 | -107 | -85 | -70 | -58 | -49 | -42 | -126 | -126 | -126 | -110 | -93 | -80 | -70 | -60 | -127 | -127 | -127 | -127 | -109 | -94 | -83 | -74 | |
| | | 80 | -173 | -173 | -156 | -124 | -103 | -85 | -72 | -62 | -175 | -175 | -175 | -161 | -136 | -118 | -103 | -89 | -176 | -176 | -176 | -158 | -138 | -122 | -109 | |
| 130 | 48-XL | 44-X | -55 | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -59 | -59 | -59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -126 | -126 | -119 | -95 | -79 | -68 | -57 | -50 | -127 | -127 | -127 | -123 | -104 | -90 | -80 | -71 | -127 | -127 | -127 | -127 | -121 | -105 | -94 | -84 | |
| | | 80 | -174 | -174 | -170 | -140 | -117 | -100 | -84 | -73 | -176 | -176 | -176 | -175 | -153 | -132 | -117 | -104 | -177 | -177 | -177 | -177 | -155 | -138 | -124 | |
| | | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 44-X | -55 | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -59 | -59 | -59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -126 | -126 | -119 | -95 | -79 | -68 | -57 | -50 | -127 | -127 | -127 | -123 | -104 | -90 | -80 | -71 | -127 | -127 | -127 | -127 | -121 | -105 | -94 | -84 | |
| | | 80 | -175 | -175 | -175 | -156 | -131 | -113 | -98 | -85 | -177 | -177 | -177 | -167 | -147 | -131 | -117 | -104 | -177 | -177 | -177 | -177 | -168 | -153 | -138 | |
| | | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 44-X | -59 | -59 | -59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -126 | -126 | -126 | -106 | -89 | -77 | -67 | -58 | -127 | -127 | -127 | -127 | -115 | -100 | -89 | -80 | -128 | -128 | -128 | -128 | -117 | -104 | 0 | 0 | |
| | | 80 | -175 | -175 | -175 | -156 | -131 | -113 | -98 | -85 | -177 | -177 | -177 | -167 | -147 | -131 | -117 | -104 | -177 | -177 | -177 | -177 | -168 | -153 | -138 | |
| | | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -127 | -127 | -127 | -127 | -106 | -89 | -77 | -67 | -58 | -127 | -127 | -127 | -127 | -115 | -100 | -89 | -80 | -128 | -128 | -128 | -128 | -117 | -104 | 0 | 0 |
| 160 | 48-XL | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -127 | -127 | -127 | -116 | -98 | -85 | -75 | -66 | -128 | -128 | -128 | -128 | -125 | -110 | -98 | 0 | -128 | -128 | -128 | -128 | -127 | 0 | 0 | 0 | |
| | | 80 | -176 | -176 | -176 | -144 | -125 | -110 | -97 | -87 | -177 | -177 | -177 | -162 | -144 | -130 | -128 | -128 | -178 | -178 | -178 | -178 | -178 | -166 | -152 | |
| | | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -127 | -127 | -127 | -127 | -107 | -93 | -83 | -74 | -62 | -128 | -128 | -128 | -128 | -120 | 0 | -128 | -128 | -128 | -128 | -128 | 0 | 0 | 0 | 0 | |
| | | 80 | -176 | -176 | -176 | -158 | -137 | -122 | -109 | -97 | -177 | -177 | -177 | -177 | -174 | -158 | -143 | -138 | -178 | -178 | -178 | -178 | -178 | -178 | -178 | |
| | | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -127 | -127 | -127 | -127 | -116 | -102 | -91 | -82 | -72 | -128 | -128 | -128 | -128 | -128 | 0 | 0 | -128 | -128 | -128 | -128 | 0 | 0 | 0 | 0 | |
| | | 80 | -177 | -177 | -177 | -171 | -150 | -133 | -120 | -118 | -178 | -178 | -178 | -178 | -178 | -178 | -171 | -155 | -178 | -178 | -178 | -178 | -178 | -178 | -178 | |
| | | -55 | -55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.1 Max Length L (inches) for Multi span only Interior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|----|----|----|----|----|---------------------------|-----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | 57 | 48 | 34 | 26 | 0 | 0 | 0 | 0 | 44 | 42 | 31 | 0 | 0 | 0 | 0 | 0 | 37 | 36 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 57 | 49 | 35 | 27 | 0 | 0 | 0 | 0 | 44 | 42 | 32 | 0 | 0 | 0 | 0 | 0 | 38 | 37 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 119 | 98 | 70 | 54 | 41 | 33 | 28 | 24 | 91 | 86 | 64 | 50 | 41 | 33 | 28 | 24 | 78 | 76 | 61 | 48 | 40 | 33 | 28 | 24 | 24 | |
| | | 80 | 135 | 118 | 90 | 73 | 60 | 49 | 41 | 35 | 104 | 99 | 78 | 65 | 55 | 48 | 41 | 35 | 89 | 86 | 71 | 60 | 52 | 45 | 41 | 35 | |
| | | 48-X | 48 | 44 | 32 | 25 | 0 | 0 | 0 | 0 | 37 | 36 | 29 | 0 | 0 | 0 | 0 | 0 | 31 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 49 | 44 | 33 | 25 | 0 | 0 | 0 | 0 | 37 | 36 | 29 | 0 | 0 | 0 | 0 | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 100 | 90 | 66 | 51 | 41 | 33 | 28 | 24 | 77 | 74 | 59 | 47 | 39 | 33 | 28 | 24 | 65 | 63 | 56 | 45 | 38 | 32 | 28 | 24 | 24 | |
| | | 80 | 114 | 106 | 82 | 68 | 57 | 49 | 41 | 35 | 87 | 85 | 70 | 59 | 51 | 45 | 40 | 35 | 74 | 72 | 64 | 54 | 48 | 42 | 38 | 35 | 35 |
| | | 48-XL | 41 | 40 | 30 | 0 | 0 | 0 | 0 | 31 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 42 | 40 | 31 | 0 | 0 | 0 | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 86 | 82 | 62 | 49 | 40 | 33 | 28 | 24 | 65 | 63 | 55 | 44 | 37 | 32 | 28 | 24 | 55 | 54 | 50 | 42 | 36 | 31 | 27 | 24 | 24 | |
| | | 80 | 98 | 94 | 75 | 63 | 54 | 47 | 41 | 35 | 74 | 72 | 64 | 54 | 48 | 42 | 38 | 34 | 63 | 61 | 57 | 49 | 44 | 39 | 35 | 32 | 32 |
| | | 44-X | 36 | 35 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 36 | 35 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 74 | 72 | 58 | 46 | 39 | 33 | 28 | 24 | 56 | 55 | 50 | 42 | 35 | 31 | 27 | 24 | 47 | 46 | 45 | 39 | 34 | 29 | 26 | 0 | 0 |
| 120 | 48-XL | 80 | 84 | 82 | 69 | 58 | 51 | 45 | 40 | 35 | 63 | 62 | 57 | 50 | 44 | 39 | 36 | 33 | 53 | 53 | 51 | 45 | 40 | 36 | 33 | 30 | 30 |
| | | 44-X | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 65 | 63 | 54 | 44 | 37 | 32 | 28 | 24 | 48 | 47 | 46 | 39 | 33 | 29 | 26 | 23 | 41 | 40 | 39 | 36 | 32 | 28 | 0 | 0 | |
| | | 80 | 74 | 72 | 63 | 54 | 47 | 42 | 38 | 34 | 55 | 54 | 52 | 46 | 41 | 37 | 33 | 31 | 46 | 46 | 45 | 41 | 37 | 34 | 31 | 28 | 28 |
| 130 | 48-XL | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 57 | 55 | 50 | 41 | 35 | 30 | 27 | 24 | 42 | 41 | 41 | 36 | 32 | 28 | 25 | 0 | 35 | 35 | 34 | 33 | 30 | 0 | 0 | 0 | |
| | | 80 | 64 | 63 | 58 | 50 | 44 | 40 | 36 | 33 | 48 | 47 | 46 | 42 | 38 | 34 | 31 | 29 | 40 | 40 | 39 | 37 | 34 | 31 | 29 | 27 | |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 50 | 49 | 47 | 39 | 33 | 29 | 26 | 23 | 37 | 37 | 36 | 34 | 30 | 26 | 0 | 0 | 31 | 31 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | 57 | 56 | 53 | 47 | 42 | 37 | 34 | 31 | 42 | 42 | 41 | 38 | 35 | 32 | 29 | 27 | 35 | 35 | 34 | 34 | 31 | 29 | 27 | 0 | |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 44 | 44 | 43 | 37 | 32 | 28 | 25 | 0 | 33 | 32 | 32 | 31 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 80 | 51 | 50 | 49 | 43 | 39 | 35 | 32 | 30 | 37 | 37 | 36 | 35 | 32 | 30 | 28 | 26 | 31 | 31 | 30 | 29 | 27 | 0 | 0 | 0 | |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 40 | 39 | 38 | 35 | 30 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 45 | 45 | 44 | 40 | 36 | 33 | 31 | 28 | 33 | 33 | 32 | 30 | 28 | 26 | 0 | 28 | 28 | 27 | 27 | 26 | 0 | 0 | 0 | 0 | |
| 160 | 48-XL | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 44 | 44 | 43 | 37 | 32 | 28 | 25 | 0 | 33 | 32 | 32 | 31 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 51 | 50 | 49 | 43 | 39 | 35 | 32 | 30 | 37 | 37 | 36 | 35 | 32 | 30 | 28 | 26 | 31 | 31 | 30 | 29 | 27 | 0 | 0 | 0 | |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 40 | 39 | 38 | 35 | 33 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 45 | 45 | 44 | 40 | 36 | 33 | 31 | 28 | 33 | 33 | 32 | 30 | 28 | 26 | 0 | 28 | 28 | 27 | 27 | 26 | 0 | 0 | 0 | 0 | |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 48-XL | 36 | 35 | 35 | 33 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 80 | 41 | 40 | 39 | 38 | 34 | 31 | 29 | 27 | 30 | 30 | 29 | 29 | 28 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.1A Max Length L (inches) for Multi span only Exterior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 47 | 47 | 36 | 27 | 0 | 0 | 0 | 0 | 33 | 33 | 32 | 0 | 0 | 0 | 0 | 0 | 27 | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 51 | 49 | 35 | 27 | 0 | 0 | 0 | 0 | 36 | 36 | 32 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 119 | 104 | 75 | 57 | 44 | 35 | 30 | 26 | 83 | 83 | 68 | 53 | 44 | 35 | 30 | 26 | 68 | 68 | 63 | 52 | 42 | 35 | 30 | 26 | |
| | 80 | 135 | 118 | 90 | 73 | 58 | 47 | 39 | 34 | 104 | 99 | 78 | 65 | 55 | 47 | 40 | 34 | 89 | 86 | 71 | 60 | 52 | 45 | 39 | 34 | |
| | 44-X | 37 | 37 | 33 | 26 | 0 | 0 | 0 | 0 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 41 | 41 | 33 | 25 | 0 | 0 | 0 | 0 | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 94 | 94 | 70 | 55 | 44 | 35 | 30 | 26 | 66 | 66 | 63 | 50 | 42 | 35 | 30 | 26 | 54 | 54 | 54 | 48 | 40 | 35 | 30 | 26 | |
| | 80 | 114 | 106 | 82 | 68 | 57 | 47 | 39 | 34 | 87 | 85 | 70 | 59 | 51 | 45 | 40 | 34 | 74 | 72 | 64 | 54 | 48 | 42 | 38 | 34 | |
| | 44-X | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 33 | 33 | 31 | 0 | 0 | 0 | 0 | 0 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 110 | 48-XL | 77 | 77 | 66 | 52 | 43 | 35 | 30 | 26 | 54 | 54 | 54 | 47 | 40 | 34 | 30 | 26 | 44 | 44 | 44 | 38 | 33 | 29 | 26 | | |
| | 80 | 98 | 94 | 75 | 63 | 54 | 47 | 39 | 34 | 74 | 72 | 64 | 54 | 48 | 42 | 38 | 34 | 63 | 61 | 57 | 49 | 44 | 39 | 35 | 32 | |
| | 44-X | 25 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 27 | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 120 | 48-XL | 63 | 63 | 61 | 49 | 41 | 35 | 30 | 26 | 45 | 45 | 45 | 44 | 38 | 33 | 29 | 26 | 37 | 37 | 37 | 37 | 36 | 31 | 28 | 25 | |
| | 80 | 84 | 82 | 69 | 58 | 51 | 45 | 39 | 34 | 63 | 62 | 57 | 50 | 44 | 39 | 36 | 33 | 53 | 53 | 51 | 45 | 40 | 36 | 33 | 30 | |
| | 44-X | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 130 | 48-XL | 54 | 54 | 54 | 47 | 39 | 34 | 30 | 26 | 38 | 38 | 38 | 38 | 36 | 31 | 28 | 25 | 31 | 31 | 31 | 31 | 31 | 30 | 26 | 0 | |
| | 80 | 74 | 72 | 63 | 54 | 47 | 42 | 38 | 34 | 55 | 54 | 52 | 46 | 41 | 37 | 33 | 31 | 46 | 46 | 45 | 41 | 37 | 34 | 31 | 28 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 140 | 48-XL | 46 | 46 | 46 | 44 | 37 | 32 | 29 | 26 | 33 | 33 | 33 | 33 | 33 | 30 | 26 | 0 | 27 | 27 | 27 | 27 | 27 | 27 | 0 | 0 | |
| | 80 | 64 | 63 | 58 | 50 | 44 | 40 | 36 | 33 | 48 | 47 | 46 | 42 | 38 | 34 | 31 | 29 | 40 | 40 | 39 | 37 | 34 | 31 | 29 | 27 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 150 | 48-XL | 40 | 40 | 40 | 40 | 36 | 31 | 28 | 25 | 28 | 28 | 28 | 28 | 28 | 28 | 0 | 0 | 23 | 23 | 23 | 23 | 0 | 0 | 0 | 0 | |
| | 80 | 57 | 56 | 53 | 47 | 42 | 37 | 34 | 31 | 42 | 42 | 41 | 38 | 35 | 32 | 29 | 27 | 35 | 35 | 34 | 34 | 31 | 29 | 27 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 160 | 48-XL | 35 | 35 | 35 | 35 | 34 | 30 | 27 | 0 | 25 | 25 | 25 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 51 | 50 | 49 | 43 | 39 | 35 | 32 | 30 | 37 | 37 | 36 | 35 | 32 | 30 | 28 | 26 | 30 | 30 | 30 | 30 | 29 | 27 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 170 | 48-XL | 31 | 31 | 31 | 31 | 29 | 0 | 0 | 22 | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 45 | 45 | 44 | 40 | 36 | 33 | 31 | 28 | 33 | 33 | 33 | 32 | 30 | 28 | 26 | 0 | 27 | 27 | 27 | 27 | 26 | 0 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 180 | 48-XL | 27 | 27 | 27 | 27 | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 41 | 40 | 39 | 38 | 34 | 31 | 29 | 27 | 29 | 29 | 29 | 28 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the exterior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 2.2 Maximum Downward Force (lbs) Multi Span Only Interior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-------|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 225 | 234 | 239 | 239 | 0 | 0 | 0 | 0 | 0 | 226 | 232 | 239 | 0 | 0 | 0 | 0 | 0 | 227 | 226 | 240 | 0 | 0 | 0 | 0 | 0 |
| | | 228 | 239 | 243 | 244 | 0 | 0 | 0 | 0 | 0 | 229 | 235 | 244 | 0 | 0 | 0 | 0 | 0 | 229 | 229 | 244 | 0 | 0 | 0 | 0 | 0 |
| | | 470 | 481 | 490 | 491 | 491 | 491 | 491 | 491 | 491 | 472 | 484 | 492 | 490 | 491 | 491 | 493 | 491 | 473 | 472 | 492 | 493 | 490 | 491 | 491 | 491 |
| | 48-XL | 535 | 581 | 629 | 665 | 715 | 715 | 715 | 715 | 715 | 538 | 552 | 600 | 632 | 660 | 710 | 718 | 715 | 540 | 538 | 578 | 611 | 635 | 670 | 710 | 715 |
| | | 537 | 580 | 616 | 646 | 685 | 715 | 715 | 715 | 715 | 540 | 535 | 586 | 617 | 640 | 665 | 706 | 715 | 541 | 528 | 562 | 594 | 618 | 637 | 665 | 700 |
| | | 539 | 580 | 616 | 646 | 685 | 715 | 715 | 715 | 715 | 540 | 535 | 586 | 617 | 640 | 665 | 706 | 715 | 541 | 528 | 562 | 594 | 618 | 637 | 665 | 700 |
| 100 | 44-X | 226 | 235 | 239 | 238 | 0 | 0 | 0 | 0 | 0 | 227 | 225 | 240 | 0 | 0 | 0 | 0 | 0 | 224 | 222 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 228 | 240 | 244 | 243 | 0 | 0 | 0 | 0 | 0 | 230 | 228 | 244 | 0 | 0 | 0 | 0 | 0 | 230 | 225 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 471 | 483 | 491 | 490 | 491 | 491 | 491 | 491 | 491 | 474 | 470 | 493 | 491 | 490 | 491 | 493 | 491 | 475 | 464 | 493 | 494 | 491 | 490 | 491 | 491 |
| | 48-XL | 537 | 569 | 616 | 646 | 685 | 715 | 715 | 715 | 715 | 540 | 535 | 586 | 617 | 640 | 665 | 706 | 715 | 541 | 528 | 562 | 594 | 618 | 637 | 665 | 700 |
| | | 539 | 569 | 616 | 646 | 685 | 715 | 715 | 715 | 715 | 540 | 535 | 586 | 617 | 640 | 665 | 706 | 715 | 541 | 528 | 562 | 594 | 618 | 637 | 665 | 700 |
| | | 539 | 569 | 616 | 646 | 685 | 715 | 715 | 715 | 715 | 540 | 535 | 586 | 617 | 640 | 665 | 706 | 715 | 541 | 528 | 562 | 594 | 618 | 637 | 665 | 700 |
| 110 | 44-X | 227 | 235 | 239 | 0 | 0 | 0 | 0 | 0 | 0 | 224 | 222 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 229 | 237 | 244 | 0 | 0 | 0 | 0 | 0 | 0 | 230 | 225 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 473 | 485 | 492 | 491 | 490 | 491 | 491 | 491 | 491 | 475 | 464 | 494 | 492 | 491 | 490 | 493 | 491 | 476 | 466 | 481 | 495 | 492 | 491 | 490 | 491 |
| | 48-XL | 539 | 558 | 603 | 634 | 655 | 694 | 715 | 715 | 715 | 541 | 529 | 572 | 603 | 626 | 644 | 664 | 699 | 542 | 531 | 548 | 579 | 603 | 622 | 637 | 657 |
| | | 540 | 533 | 592 | 622 | 644 | 660 | 698 | 715 | 715 | 542 | 531 | 560 | 590 | 613 | 631 | 645 | 661 | 543 | 534 | 547 | 566 | 589 | 608 | 623 | 636 |
| | | 540 | 533 | 592 | 622 | 644 | 660 | 698 | 715 | 715 | 542 | 531 | 560 | 590 | 613 | 631 | 645 | 661 | 543 | 534 | 547 | 566 | 589 | 608 | 623 | 636 |
| 120 | 44-X | 227 | 224 | 240 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 230 | 227 | 245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 474 | 467 | 493 | 492 | 490 | 490 | 491 | 491 | 491 | 476 | 466 | 492 | 493 | 492 | 491 | 490 | 491 | 477 | 468 | 480 | 496 | 492 | 491 | 491 | 0 |
| | 48-XL | 540 | 533 | 592 | 622 | 644 | 660 | 698 | 715 | 715 | 542 | 531 | 560 | 590 | 613 | 631 | 645 | 661 | 543 | 534 | 547 | 566 | 589 | 608 | 623 | 636 |
| | | 541 | 529 | 581 | 610 | 632 | 649 | 663 | 698 | 715 | 543 | 533 | 550 | 578 | 600 | 618 | 633 | 646 | 544 | 536 | 532 | 554 | 576 | 595 | 610 | 623 |
| | | 541 | 529 | 581 | 610 | 632 | 649 | 663 | 698 | 715 | 543 | 533 | 550 | 578 | 600 | 618 | 633 | 646 | 544 | 536 | 532 | 554 | 576 | 595 | 610 | 623 |
| 130 | 44-X | 224 | 222 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 230 | 225 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 475 | 464 | 494 | 492 | 491 | 490 | 490 | 491 | 491 | 476 | 468 | 483 | 494 | 492 | 491 | 491 | 491 | 477 | 470 | 467 | 486 | 493 | 492 | 0 | 0 |
| | 48-XL | 541 | 529 | 581 | 610 | 632 | 649 | 663 | 698 | 715 | 543 | 533 | 550 | 578 | 600 | 618 | 633 | 646 | 544 | 536 | 532 | 554 | 576 | 595 | 610 | 623 |
| | | 542 | 531 | 572 | 600 | 622 | 639 | 653 | 665 | 665 | 544 | 535 | 537 | 568 | 589 | 607 | 622 | 634 | 544 | 537 | 527 | 547 | 564 | 583 | 598 | 611 |
| | | 543 | 531 | 572 | 600 | 622 | 639 | 653 | 665 | 665 | 544 | 535 | 537 | 568 | 589 | 607 | 622 | 634 | 544 | 537 | 527 | 547 | 564 | 583 | 598 | 611 |
| 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 476 | 466 | 495 | 493 | 492 | 491 | 491 | 490 | 490 | 477 | 470 | 471 | 495 | 493 | 492 | 491 | 0 | 478 | 471 | 463 | 480 | 494 | 0 | 0 | 0 |
| | 48-XL | 542 | 531 | 572 | 600 | 622 | 639 | 653 | 665 | 665 | 544 | 535 | 537 | 568 | 589 | 607 | 622 | 634 | 544 | 537 | 527 | 547 | 564 | 583 | 598 | 611 |
| | | 543 | 531 | 572 | 600 | 622 | 639 | 653 | 665 | 665 | 545 | 535 | 537 | 568 | 589 | 607 | 622 | 634 | 545 | 537 | 530 | 546 | 554 | 571 | 586 | 0 |
| | | 543 | 531 | 572 | 600 | 622 | 639 | 653 | 665 | 665 | 545 | 535 | 537 | 568 | 589 | 607 | 622 | 634 | 545 | 537 | 530 | 546 | 554 | 571 | 586 | 0 |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 476 | 468 | 494 | 494 | 492 | 491 | 491 | 490 | 490 | 478 | 471 | 462 | 490 | 494 | 493 | 0 | 0 | 478 | 473 | 465 | 479 | 0 | 0 | 0 | 0 |
| | 48-XL | 543 | 533 | 563 | 590 | 612 | 629 | 643 | 655 | 655 | 544 | 537 | 526 | 558 | 579 | 596 | 611 | 624 | 545 | 539 | 530 | 546 | 554 | 571 | 586 | 0 |
| | | 543 | 535 | 552 | 582 | 602 | 619 | 634 | 646 | 646 | 545 | 538 | 528 | 549 | 569 | 586 | 601 | 613 | 545 | 540 | 532 | 531 | 547 | 561 | 0 | 0 |
| | | 543 | 535 | 552 | 582 | 602 | 619 | 634 | 646 | 646 | 545 | 538 | 528 | 549 | 569 | 586 | 601 | 613 | 545 | 540 | 532 | 531 | 547 | 561 | 0 | 0 |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 477 | 469 | 484 | 494 | 493 | 492 | 491 | 0 | 0 | 478 | 472 | 464 | 482 | 495 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 543 | 536 | 552 | 582 | 602 | 619 | 634 | 646 | 646 | 545 | 538 | 528 | 549 | 569 | 586 | 601 | 613 | 545 | 540 | 532 | 531 | 547 | 561 | 0 | 0 |
| | | 543 | 536 | 552 | 582 | 602 | 619 | 634 | 646 | 646 | 545 | 538 | 528 | 549 | 569 | 586 | 601 | 613 | 545 | 540 | 532 | 531 | 547 | 561 | 0 | 0 |
| | | 544 | 536 | 552 | 582 | 602 | 619 | 634 | 646 | 646 | 545 | 539 | 531</ | | | | | | | | | | | | | |



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.2A Maximum Downward Force (lbs) Multi Span Only Exterior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | 187 | 232 | 249 | 249 | 0 | 0 | 0 | 0 | 170 | 184 | 250 | 0 | 0 | 0 | 0 | 0 | 163 | 167 | 217 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 203 | 239 | 243 | 244 | 0 | 0 | 0 | 0 | 185 | 200 | 244 | 0 | 0 | 0 | 0 | 0 | 177 | 182 | 237 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 464 | 509 | 519 | 520 | 520 | 520 | 520 | 520 | 422 | 460 | 520 | 519 | 520 | 520 | 522 | 520 | 404 | 415 | 508 | 522 | 518 | 520 | 520 | 520 | 520 | |
| | 48-XL | 535 | 581 | 629 | 665 | 690 | 690 | 690 | 690 | 538 | 552 | 600 | 632 | 660 | 690 | 692 | 690 | 540 | 538 | 578 | 611 | 635 | 670 | 690 | 690 | 690 | |
| | | 175 | 201 | 249 | 249 | 0 | 0 | 0 | 0 | 162 | 165 | 218 | 0 | 0 | 0 | 0 | 0 | 156 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 191 | 219 | 244 | 243 | 0 | 0 | 0 | 0 | 176 | 180 | 237 | 0 | 0 | 0 | 0 | 0 | 170 | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 44-X | 435 | 500 | 520 | 518 | 520 | 520 | 520 | 520 | 402 | 412 | 515 | 520 | 519 | 520 | 522 | 520 | 388 | 388 | 473 | 523 | 519 | 518 | 520 | 520 | 520 | |
| | | 537 | 569 | 616 | 646 | 685 | 690 | 690 | 690 | 540 | 535 | 586 | 617 | 640 | 665 | 692 | 690 | 541 | 528 | 562 | 594 | 618 | 637 | 665 | 690 | 690 | |
| | | 167 | 179 | 242 | 0 | 0 | 0 | 0 | 0 | 156 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 182 | 195 | 244 | 0 | 0 | 0 | 0 | 0 | 170 | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 414 | 447 | 521 | 519 | 518 | 520 | 520 | 520 | 388 | 388 | 481 | 521 | 519 | 519 | 522 | 520 | 376 | 376 | 422 | 510 | 520 | 519 | 518 | 520 | 520 | |
| | | 539 | 558 | 603 | 634 | 655 | 690 | 690 | 690 | 541 | 529 | 572 | 603 | 626 | 644 | 664 | 690 | 542 | 531 | 548 | 579 | 603 | 622 | 637 | 657 | 657 | |
| 110 | 44-X | 161 | 163 | 215 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 175 | 177 | 234 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 399 | 407 | 520 | 520 | 519 | 518 | 520 | 520 | 377 | 377 | 434 | 519 | 520 | 519 | 519 | 520 | 368 | 368 | 391 | 461 | 518 | 520 | 519 | 519 | 519 | |
| | 48-XL | 540 | 533 | 592 | 622 | 644 | 660 | 690 | 690 | 542 | 531 | 560 | 590 | 613 | 631 | 645 | 661 | 543 | 534 | 547 | 566 | 589 | 608 | 623 | 636 | 636 | |
| | | 156 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 170 | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 387 | 387 | 487 | 521 | 520 | 519 | 520 | 520 | 369 | 369 | 398 | 478 | 521 | 520 | 519 | 519 | 361 | 361 | 368 | 420 | 485 | 521 | 520 | 520 | 520 | |
| | | 541 | 529 | 581 | 610 | 632 | 649 | 663 | 690 | 543 | 533 | 550 | 578 | 600 | 618 | 633 | 646 | 544 | 536 | 532 | 554 | 576 | 595 | 610 | 623 | 623 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 378 | 378 | 447 | 522 | 520 | 519 | 519 | 520 | 363 | 363 | 374 | 438 | 506 | 521 | 520 | 0 | 356 | 356 | 390 | 444 | 500 | 0 | 0 | 0 | 0 | 0 |
| 130 | 80 | 542 | 531 | 572 | 600 | 622 | 639 | 653 | 665 | 544 | 535 | 537 | 568 | 589 | 607 | 622 | 634 | 540 | 537 | 527 | 547 | 564 | 583 | 598 | 611 | 611 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 371 | 371 | 415 | 497 | 521 | 520 | 519 | 519 | 358 | 358 | 358 | 407 | 466 | 522 | 0 | 0 | 352 | 352 | 371 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 543 | 533 | 563 | 590 | 612 | 629 | 643 | 655 | 542 | 537 | 526 | 558 | 579 | 596 | 611 | 624 | 534 | 534 | 530 | 546 | 554 | 571 | 586 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 365 | 365 | 389 | 461 | 522 | 521 | 520 | 0 | 353 | 353 | 353 | 381 | 433 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 80 | 543 | 535 | 552 | 582 | 602 | 619 | 634 | 646 | 536 | 536 | 528 | 549 | 569 | 586 | 601 | 613 | 529 | 529 | 529 | 531 | 547 | 561 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 360 | 360 | 367 | 431 | 495 | 521 | 0 | 0 | 350 | 350 | 350 | 363 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 544 | 536 | 531 | 574 | 594 | 611 | 625 | 637 | 531 | 531 | 531 | 538 | 561 | 577 | 591 | 0 | 525 | 525 | 525 | 525 | 547 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 356 | 356 | 356 | 406 | 463 | 520 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 80 | 541 | 537 | 527 | 566 | 586 | 602 | 616 | 628 | 527 | 527 | 527 | 526 | 553 | 569 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the exterior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 2.3 Maximum Horizontal Force (lbs) Multi span only Interior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 83 | 69 | 50 | 38 | 0 | 0 | 0 | 0 | 89 | 84 | 63 | 40 | 0 | 0 | 0 | 0 | 104 | 89 | 72 | 48 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 84 | 71 | 51 | 39 | 0 | 0 | 0 | 0 | 90 | 85 | 64 | 40 | 0 | 0 | 0 | 0 | 105 | 90 | 74 | 49 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 173 | 143 | 102 | 78 | 60 | 49 | 41 | 35 | 185 | 175 | 130 | 102 | 83 | 68 | 57 | 49 | 217 | 185 | 148 | 118 | 98 | 82 | 69 | 59 | 59 |
| | 80 | 197 | 172 | 131 | 106 | 87 | 71 | 60 | 51 | 210 | 200 | 158 | 131 | 112 | 98 | 83 | 71 | 248 | 216 | 174 | 147 | 126 | 111 | 99 | 86 | 86 |
| 100 | 44-X | 87 | 79 | 58 | 45 | 0 | 0 | 0 | 0 | 92 | 89 | 72 | 47 | 0 | 0 | 0 | 0 | 109 | 99 | 72 | 56 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 88 | 80 | 59 | 46 | 0 | 0 | 0 | 0 | 93 | 90 | 73 | 48 | 0 | 0 | 0 | 0 | 110 | 101 | 74 | 58 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 181 | 161 | 118 | 92 | 100 | 60 | 51 | 44 | 191 | 186 | 148 | 118 | 98 | 83 | 70 | 61 | 227 | 203 | 168 | 137 | 114 | 98 | 85 | 73 | 73 |
| | 80 | 206 | 190 | 148 | 122 | 139 | 87 | 74 | 63 | 218 | 212 | 176 | 148 | 128 | 113 | 101 | 88 | 259 | 239 | 192 | 164 | 144 | 127 | 115 | 104 | 104 |
| 110 | 44-X | 90 | 87 | 65 | 0 | 0 | 0 | 0 | 93 | 92 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 109 | 82 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 91 | 88 | 67 | 0 | 0 | 0 | 0 | 95 | 93 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 114 | 110 | 84 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 187 | 179 | 134 | 106 | 118 | 73 | 61 | 53 | 196 | 192 | 166 | 134 | 113 | 97 | 85 | 73 | 235 | 225 | 182 | 154 | 130 | 113 | 100 | 88 | 88 |
| | 80 | 213 | 206 | 164 | 137 | 159 | 103 | 89 | 77 | 224 | 218 | 192 | 164 | 144 | 128 | 115 | 104 | 268 | 259 | 208 | 180 | 159 | 143 | 129 | 118 | 118 |
| 120 | 44-X | 92 | 90 | 73 | 0 | 0 | 0 | 0 | 96 | 93 | 76 | 0 | 0 | 0 | 0 | 0 | 0 | 116 | 113 | 91 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 93 | 91 | 74 | 0 | 0 | 0 | 0 | 97 | 94 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 114 | 93 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 192 | 187 | 149 | 120 | 135 | 86 | 73 | 63 | 200 | 196 | 181 | 150 | 127 | 110 | 97 | 87 | 242 | 235 | 194 | 171 | 146 | 127 | 113 | 79 | 79 |
| | 80 | 219 | 213 | 179 | 151 | 177 | 116 | 103 | 91 | 228 | 224 | 206 | 179 | 158 | 142 | 128 | 117 | 275 | 268 | 225 | 195 | 174 | 157 | 144 | 132 | 132 |
| 130 | 44-X | 93 | 92 | 0 | 0 | 0 | 0 | 0 | 96 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 116 | 116 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 95 | 93 | 0 | 0 | 0 | 0 | 0 | 99 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 196 | 192 | 164 | 133 | 151 | 97 | 85 | 74 | 204 | 200 | 192 | 164 | 141 | 123 | 109 | 98 | 247 | 241 | 206 | 183 | 161 | 142 | 107 | 93 | 93 |
| | 80 | 224 | 219 | 193 | 165 | 195 | 128 | 115 | 105 | 233 | 228 | 219 | 193 | 172 | 155 | 141 | 130 | 281 | 275 | 242 | 208 | 188 | 171 | 157 | 145 | 145 |
| 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 200 | 196 | 177 | 146 | 167 | 108 | 95 | 85 | 208 | 204 | 198 | 178 | 154 | 136 | 121 | 89 | 251 | 246 | 223 | 193 | 175 | 135 | 120 | 107 | 107 |
| | 80 | 228 | 223 | 205 | 178 | 211 | 140 | 127 | 116 | 237 | 232 | 226 | 205 | 184 | 168 | 154 | 142 | 286 | 280 | 258 | 223 | 200 | 184 | 170 | 158 | 158 |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 203 | 199 | 190 | 158 | 183 | 118 | 105 | 95 | 211 | 207 | 201 | 189 | 167 | 148 | 109 | 98 | 255 | 250 | 238 | 202 | 170 | 149 | 132 | 119 | 119 |
| | 80 | 231 | 227 | 216 | 189 | 227 | 152 | 138 | 126 | 240 | 236 | 229 | 216 | 196 | 179 | 165 | 153 | 290 | 285 | 272 | 238 | 212 | 195 | 181 | 159 | 159 |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 205 | 202 | 197 | 170 | 198 | 129 | 115 | 0 | 213 | 210 | 205 | 198 | 179 | 134 | 120 | 0 | 258 | 254 | 248 | 214 | 184 | 162 | 145 | 0 | 0 |
| | 80 | 234 | 230 | 224 | 200 | 242 | 162 | 149 | 137 | 243 | 239 | 234 | 226 | 206 | 190 | 176 | 164 | 294 | 289 | 282 | 251 | 225 | 206 | 187 | 172 | 172 |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 207 | 204 | 200 | 181 | 213 | 139 | 0 | 0 | 215 | 212 | 208 | 188 | 164 | 145 | 0 | 0 | 260 | 257 | 251 | 228 | 198 | 175 | 0 | 0 | 0 |
| | 80 | 236 | 233 | 228 | 210 | 256 | 173 | 159 | 147 | 245 | 242 | 237 | 231 | 216 | 200 | 186 | 153 | 297 | 292 | 286 | 264 | 238 | 217 | 200 | 185 | 185 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 209 | 206 | 202 | 192 | 227 | 0 | 0 | 0 | 217 | 214 | 210 | 199 | 175 | 0 | 0 | 0 | 263 | 259 | 254 | 241 | 211 | 0 | 0 | 0 | 0 |
| | 80 | 238 | 235 | 230 | 219 | 269 | 182 | 168 | 156 | 248 | 244 | 240 | 234 | 225 | 210 | 175 | 163 | 299 | 295 | 290 | 275 | 250 | 229 | 212 | 197 | 197 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 2.3A Maximum Horizontal Force (lbs) Multi span only Exterior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 69 | 69 | 52 | 40 | 0 | 0 | 0 | 0 | 71 | 71 | 66 | 41 | 0 | 0 | 0 | 0 | 86 | 86 | 65 | 50 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 75 | 71 | 51 | 39 | 0 | 0 | 0 | 0 | 78 | 74 | 64 | 40 | 0 | 0 | 0 | 0 | 94 | 89 | 71 | 49 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 170 | 149 | 106 | 81 | 62 | 50 | 42 | 37 | 177 | 164 | 135 | 106 | 86 | 70 | 59 | 51 | 214 | 187 | 151 | 123 | 102 | 85 | 71 | 61 | |
| | 80 | 197 | 172 | 131 | 106 | 84 | 68 | 57 | 50 | 210 | 200 | 158 | 131 | 112 | 95 | 80 | 69 | 248 | 216 | 174 | 147 | 126 | 111 | 96 | 83 | |
| | 100 | 67 | 67 | 60 | 47 | 0 | 0 | 0 | 0 | 70 | 70 | 65 | 49 | 0 | 0 | 0 | 0 | 84 | 84 | 76 | 59 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 88 | 80 | 59 | 46 | 0 | 0 | 0 | 0 | 93 | 90 | 73 | 48 | 0 | 0 | 0 | 0 | 110 | 101 | 74 | 58 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 166 | 165 | 124 | 96 | 77 | 62 | 52 | 45 | 173 | 172 | 153 | 123 | 102 | 86 | 73 | 63 | 209 | 208 | 160 | 143 | 119 | 102 | 88 | 76 | |
| | 80 | 206 | 190 | 148 | 122 | 103 | 84 | 71 | 61 | 218 | 212 | 176 | 148 | 128 | 113 | 99 | 85 | 259 | 239 | 192 | 164 | 144 | 127 | 115 | 103 | |
| | 44-X | 66 | 66 | 66 | 0 | 0 | 0 | 0 | 0 | 69 | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 83 | 83 | 83 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 72 | 72 | 67 | 0 | 0 | 0 | 0 | 0 | 75 | 75 | 69 | 0 | 0 | 0 | 0 | 0 | 90 | 90 | 84 | 0 | 0 | 0 | 0 | 0 | |
| 110 | 48-XL | 163 | 163 | 140 | 111 | 91 | 75 | 63 | 55 | 170 | 170 | 160 | 140 | 118 | 101 | 88 | 76 | 205 | 205 | 176 | 157 | 136 | 118 | 104 | 92 | |
| | 80 | 213 | 206 | 164 | 137 | 117 | 102 | 86 | 74 | 224 | 218 | 192 | 164 | 144 | 128 | 115 | 103 | 268 | 259 | 208 | 180 | 159 | 143 | 129 | 118 | |
| | 44-X | 65 | 65 | 65 | 0 | 0 | 0 | 0 | 0 | 68 | 68 | 68 | 0 | 0 | 0 | 0 | 0 | 82 | 82 | 82 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 71 | 71 | 71 | 0 | 0 | 0 | 0 | 0 | 74 | 74 | 74 | 0 | 0 | 0 | 0 | 0 | 89 | 89 | 89 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 161 | 161 | 156 | 125 | 104 | 89 | 75 | 65 | 168 | 168 | 162 | 156 | 133 | 115 | 102 | 90 | 203 | 203 | 196 | 157 | 151 | 133 | 118 | 106 | |
| 120 | 80 | 219 | 213 | 179 | 151 | 131 | 116 | 102 | 88 | 228 | 224 | 206 | 179 | 158 | 142 | 128 | 117 | 275 | 268 | 225 | 195 | 174 | 157 | 144 | 132 | |
| | 44-X | 65 | 65 | 65 | 0 | 0 | 0 | 0 | 0 | 67 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 81 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 70 | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 88 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 160 | 160 | 160 | 139 | 117 | 101 | 89 | 76 | 166 | 166 | 166 | 157 | 147 | 129 | 114 | 103 | 201 | 201 | 201 | 175 | 156 | 148 | 132 | 96 | |
| | 80 | 224 | 219 | 193 | 165 | 144 | 128 | 115 | 104 | 233 | 228 | 219 | 193 | 172 | 155 | 141 | 130 | 281 | 275 | 242 | 208 | 188 | 171 | 157 | 145 | |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 159 | 159 | 159 | 152 | 129 | 112 | 99 | 89 | 165 | 165 | 165 | 159 | 156 | 142 | 127 | 92 | 199 | 199 | 199 | 192 | 163 | 156 | 125 | 111 | |
| | 80 | 228 | 223 | 205 | 178 | 157 | 140 | 127 | 116 | 237 | 232 | 226 | 205 | 184 | 168 | 154 | 142 | 286 | 280 | 258 | 223 | 200 | 184 | 170 | 158 | |
| | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 158 | 158 | 158 | 158 | 141 | 124 | 110 | 99 | 164 | 164 | 164 | 164 | 156 | 155 | 114 | 103 | 198 | 198 | 198 | 198 | 178 | 155 | 138 | 124 | |
| | 80 | 231 | 227 | 216 | 189 | 168 | 152 | 138 | 126 | 240 | 236 | 229 | 216 | 196 | 179 | 165 | 153 | 290 | 285 | 272 | 238 | 212 | 195 | 181 | 159 | |
| | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 158 | 158 | 158 | 158 | 141 | 124 | 110 | 99 | 164 | 164 | 164 | 164 | 156 | 155 | 114 | 103 | 198 | 198 | 198 | 198 | 178 | 155 | 138 | 124 | |
| | 80 | 231 | 227 | 216 | 189 | 168 | 152 | 138 | 126 | 240 | 236 | 229 | 216 | 196 | 179 | 165 | 153 | 290 | 285 | 272 | 238 | 212 | 195 | 181 | 159 | |
| | 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 157 | 157 | 157 | 157 | 135 | 120 | 0 | 0 | 163 | 163 | 163 | 163 | 160 | 140 | 125 | 0 | 197 | 197 | 197 | 197 | 193 | 169 | 151 | 0 | |
| | 80 | 234 | 230 | 224 | 200 | 179 | 162 | 149 | 137 | 243 | 239 | 234 | 226 | 206 | 190 | 176 | 164 | 294 | 289 | 282 | 251 | 225 | 206 | 187 | 172 | |
| | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 156 | 156 | 156 | 156 | 146 | 0 | 0 | 0 | 162 | 162 | 162 | 162 | 162 | 151 | 0 | 0 | 196 | 196 | 196 | 196 | 196 | 183 | 0 | 0 | |
| | 80 | 236 | 233 | 228 | 210 | 189 | 173 | 159 | 147 | 245 | 242 | 237 | 231 | 216 | 200 | 186 | 153 | 297 | 292 | 286 | 264 | 238 | 217 | 200 | 185 | |
| | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 156 | 156 | 156 | 156 | 156 | 156 | 0 | 0 | 162 | 162 | 162 | 162 | 162 | 0 | 0 | 0 | 196 | 196 | 196 | 196 | 196 | 196 | 0 | 0 | |
| | 80 | 236 | 235 | 230 | 219 | 199 | 182 | 168 | 156 | 246 | 244 | 240 | 234 | 225 | 210 | 175 | 163 | 297 | 295 | 290 | 275 | 250 | 229 | 212 | 197 | |

Note: The Forces shown in the tables above account for reactions associated with the exterior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.4 Max Uplift Force (lbs) Multi span only Interior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|----------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|---|---|---|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | | | |
| 90 | 44-X | -149 | -125 | -90 | -68 | 0 | 0 | 0 | 0 | -168 | -159 | -120 | 0 | 0 | 0 | 0 | 0 | -177 | -172 | -140 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | -151 | -128 | -91 | -70 | 0 | 0 | 0 | 0 | -170 | -161 | -122 | 0 | 0 | 0 | 0 | 0 | -179 | -174 | -143 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | -312 | -257 | -184 | -141 | -108 | -88 | -74 | -64 | -350 | -332 | -246 | -193 | -158 | -128 | -108 | -93 | -370 | -359 | -288 | -230 | -189 | -158 | -133 | -115 | | | | |
| | | 80 | -355 | -310 | -236 | -191 | -157 | -128 | -107 | -93 | -399 | -379 | -300 | -249 | -212 | -185 | -157 | -135 | -421 | -410 | -338 | -284 | -245 | -216 | -193 | -167 | | | |
| | | -385 | -355 | -277 | -227 | -193 | -163 | -137 | -119 | -423 | -412 | -342 | -288 | -249 | -219 | -196 | -142 | -442 | -432 | -380 | -325 | -284 | -252 | -227 | -206 | | | | |
| 100 | 44-X | -162 | -147 | -108 | -84 | 0 | 0 | 0 | 0 | -178 | -173 | -140 | 0 | 0 | 0 | 0 | 0 | -183 | -182 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | -164 | -150 | -110 | -86 | 0 | 0 | 0 | 0 | -180 | -175 | -143 | 0 | 0 | 0 | 0 | 0 | -188 | -184 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | -337 | -301 | -221 | -172 | -138 | -112 | -94 | -81 | -372 | -362 | -288 | -230 | -191 | -162 | -137 | -171 | -388 | -379 | -333 | -270 | -225 | -194 | -168 | -145 | | | | |
| | | 80 | -385 | -355 | -277 | -227 | -193 | -163 | -137 | -119 | -423 | -412 | -342 | -288 | -249 | -219 | -196 | -142 | -442 | -432 | -380 | -325 | -284 | -252 | -227 | -206 | | | |
| | | -408 | -394 | -315 | -262 | -225 | -197 | -170 | -147 | -442 | -432 | -380 | -325 | -284 | -252 | -227 | -300 | -459 | -450 | -417 | -362 | -320 | -287 | -260 | -238 | | | | |
| 110 | 44-X | -172 | -166 | -125 | 0 | 0 | 0 | 0 | 0 | -183 | -182 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | -174 | -168 | -128 | 0 | 0 | 0 | 0 | 0 | -188 | -184 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | -358 | -343 | -257 | -203 | -168 | -139 | -117 | -101 | -388 | -379 | -328 | -265 | -223 | -192 | -169 | -211 | -403 | -395 | -366 | -309 | -261 | -226 | -200 | -178 | | | | |
| | | 80 | -408 | -394 | -315 | -262 | -225 | -197 | -170 | -147 | -442 | -432 | -380 | -325 | -284 | -252 | -227 | -300 | -459 | -450 | -417 | -362 | -320 | -287 | -260 | -238 | | | |
| | | -427 | -416 | -350 | -296 | -256 | -226 | -202 | -178 | -457 | -448 | -414 | -359 | -317 | -284 | -257 | -343 | -472 | -464 | -449 | -396 | -354 | -320 | -292 | -268 | | | | |
| 120 | 44-X | -180 | -175 | -142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -182 | -177 | -145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -375 | -365 | -291 | -234 | -195 | -167 | -142 | -123 | -401 | -393 | -363 | -300 | -255 | -221 | -195 | -255 | -414 | -407 | -394 | -347 | -296 | -258 | -230 | 0 | 0 | 0 | | |
| | | 80 | -427 | -416 | -350 | -296 | -256 | -226 | -202 | -178 | -457 | -448 | -414 | -359 | -317 | -284 | -257 | -343 | -472 | -464 | -449 | -396 | -354 | -320 | -292 | -268 | | | |
| | | -443 | -433 | -382 | -327 | -286 | -254 | -228 | -207 | -470 | -461 | -444 | -390 | -348 | -314 | -286 | -385 | -482 | -475 | -465 | -426 | -384 | -350 | -321 | -297 | | | | |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -183 | -182 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -188 | -184 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -389 | -380 | -324 | -263 | -222 | -191 | -168 | -146 | -412 | -405 | -390 | -333 | -285 | -250 | -222 | -292 | -423 | -417 | -408 | -374 | -329 | -290 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -443 | -433 | -382 | -327 | -286 | -254 | -228 | -207 | -470 | -461 | -444 | -390 | -348 | -314 | -286 | -385 | -482 | -475 | -465 | -426 | -384 | -350 | -321 | -297 | | | |
| 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -400 | -392 | -355 | -292 | -248 | -216 | -191 | -171 | -421 | -414 | -405 | -364 | -315 | -277 | -248 | 0 | -431 | -425 | -417 | -398 | -361 | 0 | 0 | 0 | 0 | 0 | | |
| | | 80 | -456 | -447 | -410 | -356 | -314 | -281 | -254 | -232 | -480 | -472 | -462 | -418 | -376 | -342 | -314 | -425 | -491 | -484 | -475 | -453 | -412 | -378 | -349 | -325 | | | |
| | | -467 | -458 | -437 | -382 | -340 | -306 | -279 | -256 | -488 | -481 | -472 | -444 | -403 | -368 | -340 | -463 | -498 | -492 | -484 | -476 | -438 | -404 | -375 | 0 | 0 | 0 | | |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -410 | -402 | -383 | -320 | -274 | -239 | -213 | -191 | -428 | -422 | -414 | -389 | -343 | -305 | 0 | 0 | -437 | -432 | -424 | -418 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 80 | -467 | -458 | -437 | -382 | -340 | -306 | -279 | -256 | -488 | -481 | -472 | -444 | -403 | -368 | -340 | -463 | -498 | -492 | -484 | -476 | -438 | -404 | -375 | 0 | 0 | 0 | |
| | | -476 | -468 | -457 | -407 | -365 | -331 | -302 | -279 | -256 | -495 | -489 | -480 | -467 | -427 | -393 | -364 | -499 | -503 | -498 | -491 | -484 | -461 | -428 | 0 | 0 | 0 | | |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -417 | -411 | -401 | -346 | -299 | -263 | -235 | 0 | -434 | -429 | -421 | -410 | -371 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -476 | -468 | -457 | -407 | -365 | -331 | -302 | -279 | -256 | -495 | -489 | -480 | -467 | -427 | -393 | -364 | -499 | -503 | -498 | -491 | -484 | -461 | -428 | 0 | 0 | 0 | |
| | | -483 | -476 | -466 | -430 | -388 | -354 | -325 | -301 | -279 | -256 | -501 | -495 | -487 | -480 | -449 | -415 | -387 | 0 | -508 | -504 | -497 | -490 | -481 | 0 | 0 | 0 | 0 | |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -424 | -418 | -409 | -371 | -323 | -286 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -483 | -476 | -466 | -430 | -388 | -354 | -325 | -301 | -279 | -256 | -501 | -495 | -487 | -480 | -449 | -415 | -387 | 0 | -508 | -504 | -497 | -490 | -481 | 0 | 0 | 0 | 0 |
| | | -490 | -483 | -474 | -451 | -410 | -376 | -347 | -322 | -299 | -276 | -505 | -501 | -493 | -486 | -469 | -436 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -430 | -424 | -416 | -394 | -346 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -490 | -483 | -474 | -451 | -410 | -376</td | | | | | | | | | | | | | | | | | | | | | |



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" **Portrait Orientation**

Table 2.4A Max Uplift Force (lbs) Multi span only Exterior Conditions

Note: The Forces shown in the tables above account for reactions associated with the exterior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" **Portrait Orientation**

Table 2.5 Max Length L (inches) for Single Span Interior Conditions

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.5A Max Length L (inches) for SingleSpan Exterior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | 40 | 40 | 28 | 22 | 0 | 0 | 0 | 0 | 28 | 28 | 26 | 0 | 0 | 0 | 0 | 0 | 23 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 41 | 39 | 29 | 22 | 0 | 0 | 0 | 0 | 29 | 29 | 26 | 0 | 0 | 0 | 0 | 0 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 100 | 85 | 61 | 46 | 36 | 29 | 24 | 21 | 69 | 69 | 56 | 44 | 36 | 29 | 24 | 21 | 57 | 57 | 53 | 42 | 35 | 29 | 24 | 21 | 21 | |
| | 80 | 134 | 117 | 89 | 68 | 52 | 43 | 36 | 31 | 95 | 95 | 77 | 64 | 52 | 43 | 36 | 31 | 78 | 78 | 71 | 59 | 51 | 43 | 36 | 31 | 31 | |
| | 44-X | 32 | 32 | 27 | 21 | 0 | 0 | 0 | 0 | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 18 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 33 | 33 | 27 | 21 | 0 | 0 | 0 | 0 | 23 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 79 | 78 | 57 | 45 | 36 | 29 | 24 | 21 | 55 | 55 | 52 | 41 | 34 | 29 | 24 | 21 | 45 | 45 | 45 | 39 | 33 | 28 | 24 | 21 | 21 | |
| | 80 | 108 | 104 | 82 | 65 | 52 | 43 | 36 | 31 | 76 | 76 | 70 | 59 | 50 | 43 | 36 | 31 | 62 | 62 | 62 | 54 | 47 | 41 | 36 | 31 | 31 | |
| | 44-X | 26 | 26 | 25 | 0 | 0 | 0 | 0 | 0 | 18 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 27 | 27 | 25 | 0 | 0 | 0 | 0 | 0 | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 64 | 64 | 54 | 42 | 35 | 29 | 24 | 21 | 45 | 45 | 45 | 39 | 33 | 28 | 24 | 21 | 37 | 37 | 37 | 36 | 31 | 27 | 24 | 21 | 21 | |
| | 80 | 88 | 88 | 75 | 62 | 51 | 43 | 36 | 31 | 62 | 62 | 62 | 54 | 47 | 41 | 36 | 31 | 51 | 51 | 51 | 49 | 43 | 39 | 35 | 31 | 31 | |
| | 44-X | 21 | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 53 | 53 | 50 | 40 | 34 | 29 | 24 | 21 | 38 | 38 | 38 | 36 | 31 | 27 | 24 | 21 | 31 | 31 | 31 | 31 | 29 | 26 | 23 | 20 | 20 | |
| | 80 | 73 | 73 | 68 | 58 | 49 | 42 | 36 | 31 | 52 | 52 | 52 | 49 | 44 | 39 | 35 | 31 | 42 | 42 | 42 | 40 | 36 | 33 | 30 | 30 | 30 | |
| | 44-X | 18 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-XL | 45 | 45 | 45 | 38 | 32 | 28 | 24 | 21 | 32 | 32 | 32 | 32 | 29 | 25 | 23 | 20 | 26 | 26 | 26 | 26 | 24 | 22 | 20 | 20 | 20 | |
| | 80 | 62 | 62 | 62 | 54 | 47 | 41 | 36 | 31 | 44 | 44 | 44 | 40 | 36 | 33 | 30 | 36 | 36 | 36 | 36 | 36 | 33 | 30 | 28 | 28 | 28 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 38 | 38 | 38 | 36 | 31 | 27 | 23 | 21 | 27 | 27 | 27 | 27 | 24 | 22 | 22 | 0 | 22 | 22 | 22 | 22 | 22 | 22 | 20 | 20 | 20 | |
| | 80 | 53 | 53 | 53 | 50 | 44 | 39 | 34 | 31 | 37 | 37 | 37 | 37 | 34 | 31 | 29 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 28 | 26 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 33 | 33 | 33 | 33 | 29 | 26 | 23 | 20 | 24 | 24 | 24 | 24 | 23 | 0 | 0 | 19 | 19 | 19 | 19 | 19 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 46 | 46 | 46 | 41 | 37 | 33 | 30 | 33 | 33 | 33 | 33 | 33 | 32 | 29 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 26 | 26 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 29 | 29 | 29 | 29 | 28 | 24 | 22 | 0 | 21 | 21 | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 40 | 40 | 40 | 38 | 35 | 32 | 29 | 28 | 28 | 28 | 28 | 28 | 28 | 27 | 25 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 26 | 26 | 26 | 26 | 23 | 0 | 0 | 18 | 18 | 18 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 35 | 35 | 35 | 35 | 33 | 30 | 28 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 0 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 23 | 23 | 23 | 23 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 31 | 31 | 31 | 31 | 31 | 31 | 29 | 27 | 22 | 22 | 22 | 22 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 2.6 Maximum Downward Force (lbs) Single span only Interior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 95 | 102 | 83 | 71 | 0 | 0 | 0 | 0 | 96 | 98 | 84 | 0 | 0 | 0 | 0 | 0 | 94 | 96 | 77 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 93 | 100 | 81 | 69 | 0 | 0 | 0 | 0 | 94 | 96 | 83 | 0 | 0 | 0 | 0 | 0 | 94 | 94 | 76 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 195 | 212 | 176 | 150 | 95 | 89 | 81 | 57 | 196 | 202 | 178 | 117 | 109 | 97 | 67 | 67 | 197 | 196 | 158 | 132 | 116 | 91 | 78 | 75 | |
| | 80 | 265 | 287 | 249 | 223 | 145 | 136 | 125 | 88 | 266 | 273 | 241 | 166 | 161 | 148 | 102 | 103 | 267 | 266 | 214 | 180 | 165 | 137 | 119 | 114 | |
| | 100 | 96 | 102 | 88 | 78 | 0 | 0 | 0 | 0 | 94 | 95 | 90 | 0 | 0 | 0 | 0 | 0 | 90 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 94 | 100 | 86 | 76 | 0 | 0 | 0 | 0 | 94 | 93 | 88 | 0 | 0 | 0 | 0 | 0 | 94 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 196 | 217 | 187 | 165 | 104 | 99 | 92 | 63 | 197 | 195 | 184 | 132 | 117 | 109 | 79 | 76 | 197 | 193 | 170 | 145 | 124 | 107 | 92 | 85 | |
| | 80 | 266 | 333 | 257 | 239 | 160 | 152 | 141 | 97 | 267 | 265 | 249 | 182 | 168 | 162 | 120 | 116 | 268 | 261 | 230 | 197 | 172 | 153 | 137 | 130 | |
| | 44-X | 96 | 103 | 93 | 0 | 0 | 0 | 0 | 0 | 90 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 94 | 100 | 91 | 0 | 0 | 0 | 0 | 0 | 94 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 197 | 218 | 197 | 179 | 112 | 111 | 103 | 70 | 197 | 193 | 189 | 145 | 124 | 118 | 93 | 85 | 198 | 194 | 180 | 156 | 138 | 120 | 106 | 96 | |
| | 80 | 266 | 334 | 267 | 254 | 165 | 170 | 158 | 107 | 268 | 261 | 257 | 197 | 173 | 171 | 137 | 130 | 268 | 263 | 244 | 212 | 187 | 168 | 152 | 141 | |
| | 44-X | 93 | 94 | 98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 94 | 101 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 197 | 219 | 204 | 193 | 118 | 122 | 116 | 77 | 198 | 194 | 195 | 155 | 136 | 127 | 104 | 95 | 198 | 195 | 189 | 166 | 149 | 134 | 119 | 0 | |
| 120 | 80 | 267 | 336 | 276 | 268 | 171 | 181 | 178 | 118 | 268 | 263 | 264 | 211 | 186 | 179 | 151 | 140 | 269 | 264 | 256 | 225 | 201 | 182 | 166 | 153 | |
| | 44-X | 90 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 94 | 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 198 | 228 | 210 | 206 | 124 | 131 | 129 | 85 | 198 | 195 | 199 | 165 | 147 | 135 | 115 | 104 | 198 | 196 | 191 | 175 | 158 | 144 | 0 | 0 | |
| | 80 | 268 | 346 | 284 | 281 | 176 | 191 | 193 | 130 | 269 | 264 | 270 | 223 | 199 | 187 | 164 | 150 | 269 | 265 | 259 | 238 | 214 | 195 | 179 | 166 | |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 198 | 232 | 215 | 217 | 133 | 139 | 139 | 93 | 198 | 195 | 199 | 173 | 156 | 143 | 126 | 0 | 199 | 196 | 192 | 183 | 167 | 0 | 0 | 0 | |
| | 80 | 268 | 337 | 292 | 294 | 184 | 199 | 204 | 139 | 269 | 265 | 270 | 235 | 211 | 194 | 176 | 162 | 269 | 266 | 261 | 249 | 226 | 208 | 192 | 178 | |
| | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 198 | 227 | 221 | 225 | 143 | 148 | 149 | 100 | 199 | 196 | 197 | 181 | 164 | 150 | 0 | 0 | 199 | 197 | 193 | 190 | 0 | 0 | 0 | 0 | |
| | 80 | 268 | 329 | 299 | 305 | 196 | 208 | 214 | 147 | 269 | 266 | 267 | 245 | 222 | 203 | 187 | 174 | 269 | 266 | 262 | 258 | 237 | 219 | 203 | 0 | |
| | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 198 | 222 | 224 | 233 | 152 | 156 | 158 | 0 | 199 | 196 | 195 | 188 | 171 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 269 | 323 | 303 | 316 | 206 | 215 | 224 | 157 | 269 | 266 | 265 | 254 | 232 | 214 | 198 | 185 | 270 | 267 | 263 | 259 | 247 | 229 | 0 | 0 | 0 |
| | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 199 | 219 | 222 | 240 | 159 | 164 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 269 | 319 | 301 | 325 | 216 | 223 | 234 | 167 | 270 | 267 | 263 | 258 | 242 | 224 | 208 | 0 | 270 | 267 | 264 | 260 | 256 | 0 | 0 | 0 | 0 |
| | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 199 | 216 | 221 | 247 | 166 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 269 | 315 | 299 | 334 | 225 | 230 | 243 | 177 | 270 | 267 | 263 | 260 | 250 | 233 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.6A Maximum Downward Force (lbs) Single span only Exterior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | 79 | 98 | 80 | 68 | 0 | 0 | 0 | 0 | 72 | 78 | 81 | 0 | 0 | 0 | 0 | 0 | 69 | 71 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 82 | 97 | 81 | 69 | 0 | 0 | 0 | 0 | 75 | 81 | 81 | 0 | 0 | 0 | 0 | 0 | 72 | 73 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 194 | 208 | 169 | 143 | 90 | 84 | 78 | 55 | 176 | 192 | 172 | 111 | 104 | 92 | 64 | 64 | 169 | 174 | 157 | 126 | 111 | 86 | 74 | 71 | 71 | |
| | | 80 | 265 | 287 | 249 | 213 | 134 | 126 | 115 | 81 | 246 | 266 | 241 | 166 | 155 | 137 | 95 | 95 | 236 | 242 | 214 | 180 | 164 | 129 | 111 | 106 | |
| 100 | 44-X | 74 | 85 | 84 | 74 | 0 | 0 | 0 | 0 | 69 | 70 | 79 | 0 | 0 | 0 | 0 | 0 | 66 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 77 | 88 | 86 | 76 | 0 | 0 | 0 | 0 | 71 | 73 | 82 | 0 | 0 | 0 | 0 | 0 | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 182 | 208 | 179 | 157 | 99 | 94 | 87 | 60 | 168 | 172 | 183 | 125 | 112 | 104 | 74 | 72 | 162 | 162 | 162 | 142 | 118 | 101 | 87 | 81 | 81 | |
| | | 80 | 254 | 281 | 257 | 234 | 148 | 141 | 130 | 90 | 235 | 239 | 249 | 182 | 166 | 155 | 111 | 107 | 227 | 227 | 227 | 197 | 172 | 151 | 131 | 120 | 120 |
| 110 | 44-X | 71 | 76 | 89 | 0 | 0 | 0 | 0 | 0 | 66 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 73 | 79 | 90 | 0 | 0 | 0 | 0 | 0 | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 173 | 187 | 190 | 171 | 108 | 105 | 98 | 67 | 162 | 162 | 182 | 139 | 118 | 113 | 88 | 81 | 157 | 157 | 157 | 155 | 132 | 114 | 101 | 91 | 91 | |
| | | 80 | 242 | 260 | 267 | 254 | 159 | 157 | 147 | 99 | 227 | 227 | 253 | 197 | 173 | 168 | 132 | 120 | 220 | 220 | 220 | 212 | 187 | 168 | 151 | 136 | 136 |
| 120 | 44-X | 68 | 69 | 86 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 71 | 72 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 167 | 170 | 200 | 184 | 113 | 117 | 110 | 74 | 158 | 158 | 172 | 152 | 129 | 121 | 99 | 90 | 154 | 154 | 154 | 154 | 146 | 127 | 113 | 102 | 102 | |
| | | 80 | 233 | 236 | 276 | 268 | 168 | 174 | 165 | 110 | 221 | 221 | 240 | 211 | 186 | 179 | 148 | 135 | 215 | 215 | 215 | 215 | 201 | 182 | 166 | 152 | 152 |
| 130 | 44-X | 66 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 162 | 162 | 200 | 197 | 119 | 125 | 123 | 81 | 154 | 154 | 164 | 154 | 141 | 129 | 110 | 99 | 151 | 151 | 151 | 151 | 151 | 140 | 125 | 0 | 0 | 0 |
| | | 80 | 226 | 226 | 279 | 281 | 176 | 186 | 183 | 121 | 216 | 216 | 229 | 216 | 199 | 187 | 164 | 147 | 211 | 211 | 211 | 211 | 211 | 195 | 179 | 166 | 166 |
| 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 158 | 158 | 192 | 210 | 126 | 133 | 133 | 89 | 152 | 152 | 158 | 152 | 152 | 137 | 120 | 0 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 0 | 0 | 0 |
| | | 80 | 221 | 221 | 268 | 294 | 184 | 197 | 197 | 133 | 212 | 212 | 221 | 212 | 211 | 194 | 176 | 162 | 208 | 208 | 208 | 208 | 208 | 192 | 178 | 178 | 178 |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 155 | 155 | 185 | 216 | 136 | 141 | 142 | 95 | 150 | 150 | 154 | 150 | 150 | 146 | 0 | 0 | 147 | 147 | 147 | 147 | 147 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 217 | 217 | 258 | 301 | 196 | 208 | 211 | 142 | 209 | 209 | 215 | 209 | 209 | 187 | 174 | 206 | 206 | 206 | 206 | 206 | 206 | 203 | 0 | 0 | 0 |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 153 | 153 | 180 | 210 | 146 | 149 | 151 | 0 | 148 | 148 | 150 | 148 | 148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 214 | 214 | 251 | 294 | 206 | 215 | 224 | 154 | 207 | 207 | 210 | 207 | 207 | 198 | 185 | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 0 | 0 | 0 |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 151 | 151 | 175 | 205 | 151 | 156 | 0 | 0 | 146 | 146 | 147 | 146 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 211 | 211 | 245 | 287 | 211 | 223 | 234 | 167 | 205 | 205 | 205 | 205 | 205 | 205 | 0 | 203 | 203 | 203 | 203 | 203 | 203 | 0 | 0 | 0 | 0 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 149 | 149 | 171 | 201 | 149 | 164 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 209 | 209 | 239 | 282 | 209 | 230 | 243 | 177 | 204 | 204 | 204 | 204 | 204 | 204 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 2.7 Maximum Horizontal Force (lbs) Single span only Interior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|----|----|----|---------------------------|-----|-----|-----|-----|-----|----|---------------------------|-----|-----|-----|-----|-----|-----|-----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 35 | 30 | 22 | 17 | 0 | 0 | 0 | 0 | 38 | 36 | 27 | 17 | 0 | 0 | 0 | 0 | 44 | 38 | 31 | 21 | 0 | 0 | 0 | 0 | |
| | | 34 | 30 | 21 | 16 | 0 | 0 | 0 | 0 | 37 | 35 | 27 | 17 | 0 | 0 | 0 | 0 | 43 | 37 | 30 | 20 | 0 | 0 | 0 | 0 | |
| | | 72 | 63 | 46 | 35 | 27 | 22 | 18 | 16 | 77 | 73 | 58 | 46 | 37 | 30 | 26 | 22 | 90 | 79 | 64 | 53 | 44 | 37 | 31 | 27 | |
| | | 80 | 97 | 85 | 65 | 52 | 41 | 34 | 28 | 24 | 104 | 99 | 78 | 65 | 55 | 47 | 39 | 34 | 123 | 107 | 86 | 72 | 63 | 55 | 47 | 41 |
| | 48-X | 37 | 34 | 25 | 20 | 0 | 0 | 0 | 0 | 38 | 38 | 31 | 20 | 0 | 0 | 0 | 0 | 46 | 43 | 31 | 25 | 0 | 0 | 0 | 0 | |
| | | 36 | 33 | 25 | 19 | 0 | 0 | 0 | 0 | 38 | 37 | 31 | 20 | 0 | 0 | 0 | 0 | 45 | 42 | 31 | 24 | 0 | 0 | 0 | 0 | |
| 100 | 48-XL | 75 | 73 | 53 | 42 | 33 | 27 | 23 | 20 | 80 | 77 | 64 | 53 | 44 | 38 | 32 | 27 | 95 | 91 | 70 | 60 | 51 | 44 | 38 | 33 | |
| | | 80 | 102 | 111 | 73 | 60 | 51 | 41 | 35 | 30 | 108 | 116 | 87 | 73 | 63 | 56 | 49 | 42 | 128 | 140 | 95 | 81 | 71 | 63 | 57 | 50 |
| | | 38 | 38 | 28 | 0 | 0 | 0 | 0 | 0 | 40 | 39 | 30 | 0 | 0 | 0 | 0 | 0 | 48 | 48 | 36 | 0 | 0 | 0 | 0 | 0 | |
| | | 37 | 37 | 28 | 0 | 0 | 0 | 0 | 0 | 39 | 39 | 29 | 0 | 0 | 0 | 0 | 0 | 47 | 47 | 35 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 78 | 81 | 60 | 48 | 39 | 33 | 28 | 24 | 82 | 84 | 70 | 60 | 51 | 44 | 38 | 33 | 98 | 101 | 76 | 66 | 58 | 51 | 45 | 40 | |
| | | 80 | 105 | 123 | 81 | 68 | 58 | 50 | 42 | 36 | 111 | 128 | 95 | 81 | 71 | 63 | 57 | 50 | 133 | 155 | 103 | 89 | 79 | 71 | 64 | 59 |
| 110 | 44-X | 38 | 38 | 32 | 0 | 0 | 0 | 0 | 0 | 39 | 39 | 33 | 0 | 0 | 0 | 0 | 0 | 47 | 47 | 40 | 0 | 0 | 0 | 0 | 0 | |
| | | 38 | 40 | 31 | 0 | 0 | 0 | 0 | 0 | 40 | 42 | 32 | 0 | 0 | 0 | 0 | 0 | 48 | 51 | 39 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | 88 | 65 | 54 | 45 | 39 | 33 | 28 | 83 | 91 | 75 | 65 | 57 | 50 | 44 | 39 | 100 | 110 | 82 | 71 | 64 | 57 | 51 | 36 | |
| | | 80 | 108 | 134 | 89 | 75 | 65 | 57 | 50 | 43 | 113 | 140 | 102 | 89 | 78 | 70 | 63 | 58 | 136 | 169 | 111 | 96 | 86 | 78 | 71 | 65 |
| | 48-X | 37 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 39 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 120 | 48-XL | 82 | 94 | 70 | 60 | 50 | 44 | 38 | 33 | 85 | 98 | 80 | 70 | 63 | 55 | 49 | 44 | 103 | 119 | 88 | 76 | 69 | 62 | 48 | 42 | |
| | | 80 | 111 | 143 | 95 | 82 | 71 | 63 | 57 | 51 | 115 | 149 | 108 | 95 | 85 | 77 | 70 | 64 | 139 | 180 | 120 | 103 | 93 | 85 | 78 | 72 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 44-X | 83 | 97 | 75 | 65 | 56 | 48 | 43 | 38 | 86 | 101 | 83 | 75 | 67 | 61 | 55 | 40 | 104 | 122 | 94 | 81 | 73 | 61 | 54 | 48 | |
| | | 80 | 113 | 141 | 101 | 88 | 77 | 69 | 63 | 57 | 117 | 147 | 112 | 101 | 91 | 83 | 76 | 70 | 142 | 178 | 127 | 110 | 99 | 91 | 84 | 78 |
| 130 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 84 | 96 | 79 | 69 | 61 | 53 | 47 | 43 | 88 | 100 | 84 | 79 | 71 | 65 | 49 | 44 | 106 | 121 | 99 | 87 | 77 | 67 | 60 | 54 | |
| | | 80 | 114 | 140 | 107 | 94 | 83 | 75 | 68 | 63 | 119 | 146 | 113 | 107 | 97 | 89 | 82 | 76 | 144 | 176 | 134 | 118 | 105 | 97 | 90 | 79 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 140 | 48-XL | 85 | 96 | 82 | 73 | 65 | 58 | 52 | 0 | 89 | 100 | 85 | 82 | 75 | 60 | 54 | 0 | 107 | 120 | 103 | 92 | 82 | 73 | 65 | 0 | |
| | | 80 | 116 | 139 | 111 | 99 | 89 | 80 | 73 | 68 | 120 | 145 | 116 | 112 | 102 | 94 | 87 | 81 | 145 | 175 | 140 | 124 | 111 | 102 | 92 | 85 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 86 | 95 | 83 | 77 | 69 | 63 | 0 | 0 | 90 | 99 | 86 | 80 | 72 | 65 | 0 | 0 | 108 | 120 | 104 | 96 | 87 | 79 | 0 | 0 | |
| | | 80 | 117 | 138 | 113 | 104 | 94 | 85 | 79 | 73 | 121 | 144 | 117 | 114 | 107 | 99 | 92 | 76 | 147 | 174 | 142 | 130 | 118 | 107 | 99 | 91 |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 84 | 96 | 79 | 69 | 61 | 53 | 47 | 43 | 88 | 100 | 84 | 79 | 71 | 65 | 49 | 44 | 106 | 121 | 99 | 87 | 77 | 67 | 60 | 54 | |
| | | 80 | 114 | 140 | 107 | 94 | 83 | 75 | 68 | 63 | 119 | 146 | 113 | 107 | 97 | 89 | 82 | 76 | 144 | 176 | 134 | 118 | 105 | 97 | 90 | 79 |
| | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 160 | 48-XL | 87 | 95 | 84 | 80 | 73 | 0 | 0 | 0 | 90 | 98 | 87 | 83 | 76 | 0 | 0 | 0 | 109 | 119 | 106 | 100 | 91 | 0 | 0 | 0 | |
| | | 80 | 116 | 139 | 111 | 99 | 89 | 80 | 73 | 68 | 120 | 145 | 116 | 112 | 102 | 94 | 87 | 81 | 145 | 175 | 140 | 124 | 111 | 102 | 92 | 85 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-XL | 86 | 95 | 83 | 77 | 69 | 63 | 0 | 0 | 90 | 99 | 86 | 80 | 72 | 65 | 0 | 0 | 108 | 120 | 104 | 96 | 87 | 79 | 0 | 0 | |
| | | 80 | 117 | 138 | 113 | 104 | 94 | 85 | 79 | 73 | 121 | 144 | 117 | 114 | 107 | 99 | 92 | 76 | 147 | 174 | 142 | 130 | 118 | 107 | 99 | 91 |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 84 | 96 | 79 | 69 | 61 | 53 | 47 | 43 | 88 | 100 | 84 | 79 | 71 | 65 | 49 | 44 | 106 | 121 | 99 | 87 | 77 | 67 | 60 | 54 | |
| | | 80 | 114 | 140 | 107 | 94 | 83 | 75 | 68 | 63 | 119 | 146 | 113 | 107 | 97 | 89 | 82 | 76 | 144 | 176 | 134 | 118 | 105 | 97 | 90 | 79 |
| | 48-XL | 87 | 95 | 84 | 80 | 73 | 0 | 0 | 0 | 90 | 98 | 87 | 83 | 76 | 0 | 0 | 0 | 109 | 119 | 106 | 100 | 91 | 0 | 0 | 0 | |
| | | 80 | | | | | | | | | | | | | | | | | | | | | | | | |



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.7A Maximum Horizontal Force (lbs) Singlespan only Exterior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|-----|-----|----|----|----|----|---------------------------|-----|-----|-----|-----|-----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | 29 | 29 | 21 | 16 | 0 | 0 | 0 | 0 | 30 | 30 | 26 | 17 | 0 | 0 | 0 | 0 | 37 | 36 | 28 | 20 | 0 | 0 | 0 | 0 | 0 | |
| | | 30 | 29 | 21 | 16 | 0 | 0 | 0 | 0 | 31 | 30 | 26 | 17 | 0 | 0 | 0 | 0 | 38 | 36 | 29 | 20 | 0 | 0 | 0 | 0 | 0 | |
| | | 71 | 61 | 44 | 33 | 25 | 21 | 17 | 15 | 74 | 69 | 55 | 43 | 35 | 29 | 24 | 21 | 89 | 77 | 63 | 51 | 42 | 35 | 29 | 25 | 25 | |
| | | 80 | 97 | 85 | 65 | 50 | 38 | 31 | 26 | 23 | 101 | 96 | 78 | 65 | 53 | 43 | 36 | 31 | 123 | 107 | 86 | 72 | 62 | 52 | 44 | 38 | 38 |
| 100 | 44-X | 29 | 29 | 24 | 19 | 0 | 0 | 0 | 0 | 30 | 30 | 28 | 20 | 0 | 0 | 0 | 0 | 36 | 36 | 30 | 24 | 0 | 0 | 0 | 0 | 0 | |
| | | 30 | 30 | 25 | 19 | 0 | 0 | 0 | 0 | 31 | 31 | 29 | 20 | 0 | 0 | 0 | 0 | 37 | 37 | 31 | 24 | 0 | 0 | 0 | 0 | 0 | |
| | | 69 | 69 | 51 | 39 | 31 | 26 | 21 | 19 | 72 | 71 | 63 | 50 | 42 | 35 | 30 | 26 | 87 | 86 | 67 | 58 | 49 | 42 | 36 | 31 | 31 | |
| | | 80 | 97 | 94 | 73 | 59 | 47 | 38 | 32 | 28 | 101 | 98 | 87 | 73 | 63 | 53 | 45 | 39 | 122 | 118 | 94 | 81 | 71 | 63 | 54 | 47 | 47 |
| 110 | 44-X | 28 | 28 | 27 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 28 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 29 | 29 | 27 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 29 | 0 | 0 | 0 | 0 | 0 | 37 | 37 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 68 | 68 | 57 | 45 | 37 | 31 | 26 | 22 | 71 | 71 | 67 | 57 | 48 | 41 | 36 | 31 | 86 | 86 | 72 | 65 | 56 | 48 | 42 | 38 | 38 | |
| | | 80 | 96 | 96 | 81 | 68 | 56 | 46 | 39 | 34 | 100 | 100 | 94 | 81 | 71 | 62 | 54 | 47 | 120 | 120 | 102 | 89 | 79 | 71 | 64 | 56 | 56 |
| 120 | 44-X | 28 | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 36 | 36 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 67 | 67 | 64 | 51 | 43 | 37 | 31 | 27 | 70 | 70 | 67 | 64 | 54 | 47 | 42 | 37 | 85 | 85 | 80 | 66 | 62 | 54 | 48 | 43 | 43 | |
| | | 80 | 95 | 95 | 89 | 75 | 64 | 55 | 46 | 40 | 98 | 98 | 93 | 89 | 78 | 70 | 62 | 56 | 119 | 119 | 111 | 94 | 86 | 78 | 71 | 65 | 65 |
| 130 | 44-X | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 36 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 67 | 67 | 67 | 57 | 48 | 41 | 36 | 31 | 69 | 69 | 66 | 60 | 53 | 47 | 42 | 38 | 84 | 84 | 84 | 72 | 65 | 61 | 54 | 39 | 39 | |
| | | 80 | 94 | 94 | 94 | 82 | 71 | 62 | 54 | 47 | 97 | 97 | 92 | 85 | 77 | 70 | 63 | 118 | 118 | 118 | 103 | 92 | 85 | 78 | 72 | 72 | |
| 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 66 | 66 | 66 | 62 | 53 | 46 | 41 | 36 | 69 | 69 | 65 | 65 | 58 | 52 | 38 | 83 | 83 | 83 | 78 | 67 | 65 | 51 | 46 | 46 | 46 | |
| | | 80 | 93 | 93 | 93 | 88 | 77 | 69 | 61 | 54 | 97 | 97 | 92 | 91 | 83 | 76 | 70 | 117 | 117 | 117 | 110 | 97 | 91 | 84 | 78 | 78 | 78 |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 66 | 66 | 66 | 66 | 58 | 51 | 45 | 40 | 69 | 69 | 69 | 65 | 63 | 47 | 42 | 83 | 83 | 83 | 73 | 64 | 56 | 51 | 51 | 51 | 51 | |
| | | 80 | 92 | 92 | 92 | 83 | 75 | 67 | 60 | 96 | 96 | 96 | 91 | 89 | 82 | 76 | 116 | 116 | 116 | 116 | 111 | 101 | 94 | 90 | 76 | 76 | |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 66 | 66 | 66 | 66 | 63 | 55 | 49 | 0 | 68 | 68 | 68 | 65 | 57 | 51 | 0 | 82 | 82 | 82 | 82 | 79 | 69 | 62 | 0 | 0 | | |
| | | 80 | 92 | 92 | 92 | 89 | 80 | 73 | 66 | 96 | 96 | 96 | 92 | 91 | 87 | 81 | 116 | 116 | 116 | 116 | 111 | 101 | 92 | 83 | 83 | 83 | |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 65 | 65 | 65 | 65 | 60 | 0 | 0 | 0 | 68 | 68 | 68 | 68 | 62 | 0 | 0 | 82 | 82 | 82 | 82 | 82 | 75 | 0 | 0 | 0 | 0 | |
| | | 80 | 92 | 92 | 92 | 92 | 85 | 79 | 72 | 95 | 95 | 95 | 95 | 91 | 91 | 75 | 115 | 115 | 115 | 115 | 107 | 99 | 91 | 91 | 91 | 91 | |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 65 | 65 | 65 | 65 | 64 | 0 | 0 | 0 | 68 | 68 | 68 | 68 | 67 | 0 | 0 | 82 | 82 | 82 | 82 | 82 | 80 | 0 | 0 | 0 | 0 | |
| | | 80 | 91 | 91 | 91 | 91 | 90 | 83 | 77 | 95 | 95 | 95 | 95 | 94 | 87 | 80 | 115 | 115 | 115 | 115 | 113 | 105 | 97 | 97 | 97 | 97 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 2.8 Max Uplift Force (lbs) Single span only Interior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|---|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | -63 | -54 | -39 | -30 | 0 | 0 | 0 | 0 | -71 | -68 | -52 | 0 | 0 | 0 | 0 | 0 | -73 | -73 | -60 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -62 | -53 | -38 | -29 | 0 | 0 | 0 | 0 | -70 | -66 | -51 | 0 | 0 | 0 | 0 | 0 | -73 | -71 | -59 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -130 | -113 | -83 | -63 | -49 | -39 | -33 | -29 | -233 | -138 | -110 | -87 | -71 | -58 | -49 | -42 | -154 | -150 | -123 | -103 | -85 | -71 | -60 | -52 | | |
| | | 80 | -176 | -153 | -117 | -94 | -74 | -60 | -51 | -44 | -198 | -187 | -148 | -123 | -105 | -88 | -75 | -64 | -208 | -203 | -167 | -141 | -121 | -107 | -92 | -79 | |
| | | -69 | -64 | -47 | -36 | 0 | 0 | 0 | 0 | -73 | -73 | -61 | 0 | 0 | 0 | 0 | 0 | -73 | -73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | -62 | -62 | -46 | -36 | 0 | 0 | 0 | 0 | -74 | -72 | -60 | 0 | 0 | 0 | 0 | 0 | -77 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -67 | -62 | -46 | -36 | 0 | 0 | 0 | 0 | -74 | -72 | -60 | 0 | 0 | 0 | 0 | 0 | -77 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -140 | -136 | -99 | -78 | -62 | -50 | -42 | -37 | -196 | -150 | -125 | -103 | -86 | -73 | -62 | -53 | -161 | -158 | -139 | -119 | -101 | -87 | -75 | -65 | | |
| | | 80 | -190 | -208 | -137 | -112 | -95 | -77 | -65 | -56 | -209 | -204 | -169 | -143 | -123 | -108 | -94 | -81 | -219 | -214 | -188 | -161 | -140 | -125 | -112 | -100 | |
| | | -73 | -72 | -54 | 0 | 0 | 0 | 0 | 0 | -73 | -73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | -71 | -71 | -53 | 0 | 0 | 0 | 0 | 0 | -77 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -149 | -154 | -115 | -91 | -76 | -63 | -53 | -45 | -166 | -158 | -139 | -119 | -100 | -86 | -76 | -65 | -167 | -164 | -152 | -132 | -117 | -102 | -90 | -80 | | |
| | | 80 | -202 | -236 | -156 | -130 | -111 | -96 | -81 | -70 | -219 | -214 | -188 | -161 | -141 | -125 | -112 | -100 | -227 | -222 | -206 | -179 | -158 | -142 | -129 | -118 | |
| | | -73 | -73 | -62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -75 | -79 | -60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | -156 | -171 | -128 | -105 | -88 | -75 | -64 | -55 | -167 | -164 | -151 | -131 | -115 | -99 | -88 | -79 | -172 | -169 | -164 | -144 | -129 | -116 | -103 | 0 | | |
| | | 80 | -211 | -262 | -173 | -146 | -127 | -112 | -98 | -85 | -226 | -222 | -205 | -178 | -157 | -141 | -127 | -116 | -233 | -229 | -222 | -196 | -175 | -158 | -144 | -133 | |
| | | -73 | -73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -77 | -86 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -162 | -187 | -139 | -119 | -100 | -86 | -76 | -66 | -171 | -168 | -162 | -142 | -127 | -112 | -100 | -90 | -176 | -173 | -170 | -156 | -140 | -128 | 0 | 0 | 0 | |
| 130 | 48-XL | 80 | -219 | -283 | -189 | -162 | -141 | -125 | -113 | -101 | -232 | -228 | -220 | -193 | -172 | -155 | -142 | -130 | -238 | -235 | -230 | -211 | -190 | -173 | -159 | -147 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -166 | -195 | -150 | -130 | -112 | -97 | -86 | -77 | -175 | -172 | -169 | -153 | -137 | -125 | -112 | 0 | -179 | -177 | -173 | -165 | -150 | 0 | 0 | 0 | 0 | |
| | | 80 | -226 | -283 | -203 | -176 | -155 | -139 | -126 | -115 | -237 | -234 | -228 | -207 | -186 | -169 | -155 | -143 | -243 | -240 | -235 | -224 | -204 | -187 | -173 | -161 | |
| 140 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -170 | -195 | -159 | -140 | -123 | -108 | -96 | -86 | -178 | -176 | -172 | -162 | -147 | -135 | 0 | 0 | -182 | -180 | -177 | -174 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -231 | -283 | -216 | -189 | -168 | -152 | -138 | -126 | -241 | -238 | -233 | -219 | -199 | -182 | -168 | -156 | -246 | -243 | -239 | -235 | -216 | -200 | -186 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -174 | -195 | -167 | -149 | -133 | -118 | -106 | 0 | -181 | -178 | -175 | -170 | -156 | 0 | 0 | 0 | 0 | -182 | -180 | -177 | -174 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -235 | -283 | -226 | -201 | -180 | -164 | -150 | -138 | -245 | -242 | -237 | -231 | -211 | -194 | -180 | -168 | -249 | -247 | -243 | -239 | -228 | -212 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -176 | -195 | -170 | -157 | -142 | -128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -239 | -283 | -231 | -213 | -192 | -175 | -161 | -149 | -248 | -245 | -241 | -237 | -222 | -206 | -191 | 0 | -251 | -249 | -246 | -243 | -238 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -176 | -195 | -170 | -157 | -142 | -128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -239 | -283 | -231 | -213 | -192 | -175 | -161 | -149 | -248 | -245 | -241 | -237 | -222 | -206 | -191 | 0 | -251 | -249 | -246 | -243 | -238 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -179 | -195 | -173 | -164 | -150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -242 | -283 | -235 | -223 | -203 | -186 | -172 | -159 | -250 | -248 | -244 | -241 | -232 | -216 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 2.8A Max Uplift Force (lbs) Single span only Exterior Conditions

| Exp C | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | -53 | -52 | -37 | -29 | 0 | 0 | 0 | 0 | -54 | -54 | -50 | 0 | 0 | 0 | 0 | 0 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -54 | -52 | -38 | -29 | 0 | 0 | 0 | 0 | -55 | -55 | -50 | 0 | 0 | 0 | 0 | 0 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -128 | -110 | -78 | -60 | -46 | -37 | -31 | -27 | -130 | -130 | -105 | -82 | -67 | -54 | -46 | -39 | -131 | -131 | -122 | -98 | -81 | -67 | -56 | -49 | |
| | | 80 | -176 | -153 | -117 | -90 | -69 | -56 | -47 | -41 | -183 | -183 | -148 | -123 | -101 | -82 | -69 | -59 | -184 | -184 | -167 | -141 | -121 | -101 | -85 | -73 |
| | | -53 | -53 | -45 | -35 | 0 | 0 | 0 | 0 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | -55 | -55 | -46 | -36 | 0 | 0 | 0 | 0 | -56 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -129 | -128 | -94 | -73 | -58 | -47 | -40 | -34 | -131 | -131 | -123 | -98 | -81 | -69 | -58 | -50 | -132 | -132 | -132 | -115 | -96 | -83 | -71 | -61 | |
| | | 80 | -182 | -175 | -137 | -110 | -88 | -72 | -60 | -52 | -184 | -184 | -169 | -143 | -122 | -103 | -87 | -75 | -185 | -185 | -185 | -161 | -140 | -124 | -107 | -92 |
| | | -54 | -54 | -52 | 0 | 0 | 0 | 0 | 0 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -56 | -56 | -53 | 0 | 0 | 0 | 0 | 0 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | -130 | -130 | -110 | -87 | -72 | -59 | -50 | -43 | -132 | -132 | -132 | -113 | -95 | -82 | -71 | -61 | -133 | -133 | -133 | -131 | -111 | -97 | -85 | -75 | |
| | | 80 | -183 | -183 | -156 | -130 | -107 | -89 | -75 | -65 | -185 | -185 | -185 | -161 | -141 | -123 | -108 | -92 | -186 | -186 | -186 | -179 | -158 | -142 | -128 | -113 |
| | | -54 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -56 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -131 | -131 | -125 | -100 | -83 | -71 | -60 | -52 | -133 | -133 | -133 | -128 | -109 | -94 | -83 | -74 | -133 | -133 | -133 | -133 | -126 | -110 | -98 | -88 | |
| 120 | 48-XL | 80 | -184 | -184 | -173 | -146 | -124 | -107 | -91 | -78 | -186 | -186 | -186 | -178 | -157 | -141 | -125 | -112 | -187 | -187 | -187 | -187 | -175 | -158 | -144 | -132 |
| | | -54 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -56 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -131 | -131 | -125 | -100 | -83 | -71 | -60 | -52 | -133 | -133 | -133 | -128 | -109 | -94 | -83 | -74 | -133 | -133 | -133 | -133 | -126 | -110 | -98 | -88 | |
| | | 80 | -184 | -184 | -173 | -146 | -124 | -107 | -91 | -78 | -186 | -186 | -186 | -178 | -157 | -141 | -125 | -112 | -187 | -187 | -187 | -187 | -175 | -158 | -144 | -132 |
| 130 | 48-XL | 80 | -185 | -185 | -185 | -162 | -141 | -122 | -108 | -93 | -187 | -187 | -187 | -187 | -172 | -155 | -142 | -127 | -187 | -187 | -187 | -187 | -173 | -159 | -147 | |
| | | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -132 | -132 | -132 | -112 | -95 | -82 | -72 | -62 | -133 | -133 | -133 | -133 | -122 | -107 | -95 | -85 | -134 | -134 | -134 | -134 | -134 | -124 | -110 | 0 | |
| | | 80 | -185 | -185 | -185 | -162 | -141 | -122 | -108 | -93 | -187 | -187 | -187 | -187 | -172 | -155 | -142 | -127 | -187 | -187 | -187 | -187 | -173 | -159 | -147 | |
| 140 | 48-XL | 80 | -186 | -186 | -186 | -176 | -155 | -138 | -122 | -109 | -187 | -187 | -187 | -187 | -186 | -169 | -155 | -143 | -188 | -188 | -188 | -188 | -187 | -173 | -161 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -133 | -133 | -133 | -125 | -106 | -92 | -81 | -73 | -133 | -133 | -133 | -133 | -119 | -106 | 0 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | |
| | | 80 | -186 | -186 | -186 | -176 | -155 | -138 | -122 | -109 | -187 | -187 | -187 | -187 | -186 | -169 | -155 | -143 | -188 | -188 | -188 | -188 | -187 | -173 | -161 | |
| 150 | 48-XL | 80 | -187 | -187 | -187 | -187 | -168 | -152 | -136 | -122 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -186 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -133 | -133 | -133 | -117 | -102 | -91 | -82 | -73 | -134 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | 0 | |
| | | 80 | -187 | -187 | -187 | -187 | -168 | -152 | -136 | -122 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -186 | 0 | |
| 160 | 48-XL | 80 | -187 | -187 | -187 | -187 | -168 | -164 | -150 | -135 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | -188 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -133 | -133 | -133 | -133 | -128 | -112 | -100 | 0 | -134 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | |
| | | 80 | -188 | -188 | -188 | -188 | -188 | -186 | -172 | -159 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | 0 | |
| 170 | 48-XL | 80 | -188 | -188 | -188 | -188 | -188 | -186 | -172 | -159 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -134 | -134 | -134 | -134 | -134 | -122 | 0 | 0 | -134 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | |
| | | 80 | -188 | -188 | -188 | -188 | -188 | -186 | -172 | -159 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | 0 | |
| 180 | 48-XL | 80 | -188 | -188 | -188 | -188 | -188 | -186 | -172 | -159 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -134 | -134 | -134 | -134 | -134 | -132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -188 | -188 | -188 | -188 | -188 | -186 | -172 | -159 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | -189 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones

<p style



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 3.1 Max Length L (inches) for Multi span only Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 61 |
| 90 | 44-X | 49 | 45 | 34 | 26 | 0 | 0 | 0 | 0 | 37 | 36 | 30 | 0 | 0 | 0 | 0 | 0 | 32 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 50 | 46 | 33 | 26 | 0 | 0 | 0 | 0 | 38 | 37 | 30 | 0 | 0 | 0 | 0 | 0 | 33 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 108 | 99 | 72 | 56 | 45 | 36 | 30 | 26 | 82 | 80 | 65 | 52 | 43 | 36 | 31 | 26 | 70 | 68 | 59 | 50 | 41 | 36 | 30 | 26 | |
| | 80 | 122 | 111 | 87 | 71 | 58 | 47 | 39 | 34 | 93 | 91 | 74 | 62 | 54 | 47 | 40 | 34 | 79 | 77 | 67 | 57 | 50 | 44 | 39 | 34 | |
| | 44-X | 41 | 40 | 32 | 0 | 0 | 0 | 0 | 0 | 31 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 42 | 41 | 31 | 0 | 0 | 0 | 0 | 0 | 32 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 91 | 87 | 67 | 53 | 44 | 36 | 30 | 26 | 69 | 67 | 59 | 48 | 41 | 35 | 31 | 26 | 58 | 57 | 53 | 46 | 39 | 34 | 30 | 26 | |
| | 80 | 103 | 99 | 79 | 65 | 56 | 47 | 39 | 34 | 78 | 76 | 66 | 57 | 50 | 44 | 39 | 34 | 66 | 65 | 59 | 52 | 46 | 41 | 37 | 34 | |
| | 44-X | 35 | 34 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 36 | 35 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 77 | 75 | 63 | 50 | 42 | 36 | 30 | 26 | 58 | 57 | 53 | 45 | 38 | 33 | 29 | 26 | 49 | 48 | 47 | 41 | 36 | 32 | 28 | 0 | |
| | 80 | 88 | 85 | 72 | 60 | 52 | 46 | 39 | 34 | 66 | 64 | 59 | 52 | 46 | 41 | 37 | 34 | 55 | 55 | 53 | 46 | 41 | 37 | 34 | 31 | |
| | 44-X | 30 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 31 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 67 | 65 | 58 | 47 | 40 | 34 | 30 | 26 | 50 | 49 | 47 | 41 | 36 | 32 | 28 | 25 | 42 | 41 | 40 | 37 | 33 | 30 | 0 | 0 | |
| | 80 | 75 | 74 | 65 | 56 | 49 | 43 | 39 | 34 | 56 | 55 | 53 | 47 | 42 | 38 | 34 | 32 | 47 | 47 | 46 | 42 | 38 | 34 | 32 | 29 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-XL | 58 | 57 | 52 | 44 | 38 | 33 | 29 | 26 | 43 | 42 | 41 | 38 | 34 | 30 | 27 | 0 | 36 | 36 | 35 | 33 | 30 | 0 | 0 | 0 | |
| | 80 | 65 | 64 | 59 | 51 | 45 | 41 | 37 | 34 | 49 | 48 | 47 | 43 | 38 | 35 | 32 | 30 | 41 | 40 | 40 | 38 | 34 | 32 | 29 | 27 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 51 | 50 | 48 | 42 | 36 | 31 | 28 | 25 | 37 | 37 | 36 | 34 | 31 | 28 | 0 | 0 | 31 | 31 | 31 | 30 | 0 | 0 | 0 | 0 | |
| | 80 | 57 | 56 | 54 | 47 | 42 | 38 | 35 | 32 | 42 | 42 | 41 | 39 | 35 | 32 | 30 | 28 | 35 | 35 | 35 | 34 | 32 | 29 | 27 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 45 | 44 | 43 | 39 | 34 | 30 | 27 | 0 | 33 | 33 | 32 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 50 | 50 | 49 | 44 | 39 | 36 | 33 | 30 | 37 | 37 | 36 | 33 | 30 | 28 | 26 | 31 | 31 | 30 | 30 | 29 | 27 | 0 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 40 | 39 | 38 | 36 | 32 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 45 | 44 | 43 | 40 | 37 | 33 | 31 | 29 | 33 | 33 | 32 | 30 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 35 | 35 | 34 | 33 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 40 | 40 | 39 | 37 | 34 | 31 | 29 | 27 | 29 | 29 | 29 | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 32 | 31 | 31 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 36 | 36 | 35 | 34 | 32 | 29 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
Standard size 43.2"x 80" Portrait Orientation

Table 3.1A Max Length L (inches) for Multi span only Exterior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 61 |
| 90 | 44-X | 39 | 39 | 34 | 27 | 0 | 0 | 0 | 0 | 27 | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 43 | 43 | 34 | 26 | 0 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 101 | 95 | 73 | 57 | 45 | 37 | 31 | 27 | 71 | 71 | 63 | 53 | 44 | 37 | 31 | 27 | 58 | 58 | 57 | 49 | 42 | 36 | 31 | 27 | |
| | 80 | 122 | 111 | 87 | 69 | 55 | 44 | 37 | 32 | 93 | 91 | 74 | 62 | 53 | 44 | 37 | 32 | 79 | 77 | 67 | 57 | 50 | 44 | 37 | 32 | |
| | 44-X | 31 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 22 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 34 | 34 | 32 | 0 | 0 | 0 | 0 | 0 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 80 | 80 | 67 | 54 | 45 | 37 | 31 | 27 | 57 | 57 | 56 | 48 | 41 | 36 | 31 | 27 | 46 | 46 | 46 | 44 | 39 | 34 | 30 | 27 | |
| | 80 | 103 | 99 | 79 | 65 | 54 | 44 | 37 | 32 | 78 | 76 | 66 | 57 | 50 | 43 | 37 | 32 | 64 | 64 | 59 | 52 | 46 | 41 | 36 | 32 | |
| | 44-X | 25 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-X | 28 | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 65 | 65 | 61 | 51 | 42 | 36 | 31 | 27 | 46 | 46 | 46 | 44 | 39 | 34 | 30 | 27 | 38 | 38 | 38 | 38 | 35 | 32 | 29 | 0 | |
| | 80 | 88 | 85 | 72 | 60 | 51 | 44 | 37 | 32 | 64 | 64 | 59 | 52 | 46 | 41 | 36 | 32 | 53 | 53 | 53 | 46 | 41 | 37 | 34 | 31 | |
| | 44-X | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-X | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 54 | 54 | 54 | 47 | 40 | 35 | 31 | 27 | 39 | 39 | 39 | 36 | 32 | 28 | 26 | 32 | 32 | 32 | 32 | 32 | 32 | 29 | 0 | 0 | |
| | 80 | 75 | 74 | 65 | 56 | 49 | 42 | 37 | 32 | 54 | 54 | 53 | 47 | 42 | 38 | 34 | 31 | 44 | 44 | 42 | 38 | 34 | 32 | 29 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 46 | 46 | 46 | 44 | 38 | 33 | 30 | 26 | 33 | 33 | 33 | 33 | 33 | 30 | 27 | 0 | 27 | 27 | 27 | 27 | 27 | 27 | 0 | 0 | |
| | 80 | 64 | 64 | 59 | 51 | 45 | 40 | 36 | 32 | 45 | 45 | 45 | 43 | 38 | 35 | 32 | 30 | 37 | 37 | 37 | 37 | 34 | 32 | 29 | 27 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 39 | 39 | 39 | 39 | 36 | 32 | 28 | 25 | 28 | 28 | 28 | 28 | 28 | 28 | 0 | 0 | 23 | 23 | 23 | 23 | 0 | 0 | 0 | 0 | |
| | 80 | 55 | 55 | 54 | 47 | 42 | 38 | 34 | 31 | 39 | 39 | 39 | 35 | 32 | 30 | 28 | 32 | 32 | 32 | 32 | 32 | 29 | 27 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 34 | 34 | 34 | 34 | 33 | 30 | 27 | 0 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 47 | 47 | 47 | 44 | 39 | 36 | 33 | 30 | 34 | 34 | 34 | 33 | 30 | 28 | 26 | 28 | 28 | 28 | 28 | 28 | 27 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 30 | 30 | 30 | 30 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 42 | 42 | 42 | 40 | 37 | 33 | 31 | 28 | 30 | 30 | 30 | 30 | 30 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 26 | 26 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 37 | 37 | 37 | 37 | 34 | 31 | 29 | 27 | 26 | 26 | 26 | 26 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 23 | 23 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 33 | 33 | 33 | 33 | 32 | 29 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the exterior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.2 Maximum Downward Force (lbs) Multi Span Only Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 222 | 236 | 249 | 249 | 0 | 0 | 0 | 0 | 223 | 223 | 243 | 0 | 0 | 0 | 0 | 0 | 224 | 218 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 228 | 242 | 246 | 245 | 0 | 0 | 0 | 0 | 229 | 230 | 246 | 0 | 0 | 0 | 0 | 0 | 230 | 224 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 490 | 521 | 532 | 531 | 532 | 532 | 532 | 532 | 492 | 493 | 533 | 532 | 531 | 532 | 534 | 532 | 493 | 482 | 516 | 535 | 531 | 531 | 532 | 532 | |
| | 80 | 554 | 589 | 639 | 670 | 690 | 690 | 690 | 690 | 557 | 557 | 608 | 640 | 664 | 690 | 692 | 690 | 558 | 545 | 584 | 617 | 642 | 661 | 690 | 690 | |
| | 44-X | 223 | 231 | 250 | 0 | 0 | 0 | 0 | 0 | 224 | 218 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 229 | 238 | 246 | 0 | 0 | 0 | 0 | 0 | 230 | 225 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 491 | 510 | 533 | 532 | 530 | 532 | 532 | 532 | 494 | 482 | 524 | 533 | 532 | 531 | 534 | 532 | 495 | 485 | 502 | 530 | 532 | 531 | 531 | 532 | |
| | 80 | 556 | 577 | 624 | 656 | 678 | 690 | 690 | 690 | 558 | 545 | 592 | 624 | 648 | 666 | 691 | 690 | 559 | 548 | 568 | 600 | 624 | 644 | 660 | 684 | |
| | 44-X | 223 | 221 | 245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 230 | 227 | 247 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 493 | 487 | 534 | 532 | 531 | 530 | 532 | 532 | 495 | 485 | 512 | 533 | 532 | 531 | 534 | 532 | 496 | 487 | 499 | 517 | 533 | 532 | 532 | 0 | |
| | 80 | 557 | 551 | 611 | 642 | 665 | 682 | 690 | 690 | 559 | 548 | 579 | 609 | 633 | 651 | 667 | 683 | 561 | 551 | 565 | 584 | 608 | 628 | 644 | 657 | |
| 110 | 44-X | 224 | 219 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 230 | 225 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 494 | 483 | 530 | 533 | 532 | 531 | 530 | 532 | 495 | 487 | 501 | 527 | 534 | 532 | 532 | 531 | 496 | 489 | 485 | 505 | 525 | 533 | 0 | 0 | |
| | 80 | 559 | 546 | 599 | 629 | 652 | 670 | 684 | 690 | 560 | 551 | 567 | 596 | 619 | 638 | 653 | 666 | 561 | 553 | 548 | 571 | 594 | 613 | 629 | 643 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 495 | 485 | 521 | 534 | 533 | 532 | 531 | 530 | 496 | 489 | 488 | 517 | 534 | 533 | 532 | 0 | 497 | 491 | 481 | 499 | 514 | 0 | 0 | 0 | |
| | 80 | 560 | 548 | 589 | 618 | 640 | 658 | 672 | 684 | 561 | 553 | 552 | 584 | 607 | 625 | 640 | 653 | 562 | 555 | 544 | 565 | 581 | 600 | 615 | 629 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 495 | 487 | 512 | 535 | 534 | 533 | 532 | 531 | 497 | 490 | 481 | 507 | 526 | 534 | 0 | 497 | 492 | 484 | 495 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 560 | 550 | 579 | 607 | 629 | 647 | 661 | 674 | 562 | 554 | 544 | 574 | 595 | 613 | 628 | 641 | 563 | 556 | 547 | 560 | 569 | 587 | 603 | 0 | |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 496 | 485 | 521 | 534 | 533 | 532 | 531 | 530 | 496 | 489 | 488 | 517 | 534 | 533 | 532 | 0 | 497 | 491 | 481 | 499 | 514 | 0 | 0 | 0 | |
| | 80 | 560 | 548 | 589 | 618 | 640 | 658 | 672 | 684 | 561 | 553 | 552 | 584 | 607 | 625 | 640 | 653 | 562 | 555 | 544 | 565 | 581 | 600 | 615 | 629 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 495 | 487 | 512 | 535 | 534 | 533 | 532 | 531 | 497 | 490 | 481 | 507 | 526 | 534 | 0 | 497 | 492 | 484 | 495 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 560 | 550 | 579 | 607 | 629 | 647 | 661 | 674 | 562 | 554 | 544 | 574 | 595 | 613 | 628 | 641 | 563 | 556 | 547 | 560 | 569 | 587 | 603 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 496 | 488 | 497 | 528 | 534 | 533 | 532 | 0 | 497 | 491 | 483 | 499 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 561 | 552 | 562 | 598 | 619 | 636 | 651 | 663 | 562 | 556 | 546 | 565 | 585 | 602 | 617 | 630 | 563 | 557 | 549 | 544 | 565 | 576 | 0 | 0 | |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 496 | 490 | 480 | 521 | 535 | 534 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 562 | 554 | 542 | 589 | 610 | 627 | 641 | 654 | 563 | 557 | 548 | 550 | 576 | 592 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 497 | 491 | 482 | 514 | 531 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 562 | 555 | 545 | 581 | 601 | 618 | 632 | 644 | 563 | 558 | 550 | 543 | 567 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 497 | 492 | 484 | 504 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 562 | 556 | 547 | 570 | 593 | 609 | 623 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 497 | 492 | 484 | 504 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 562 | 556 | 547 | 570 | 593 | 609 | 623 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

<p style="text-align:



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80"

Table 3.2A Maximum Downward Force (lbs) Multi Span Only Exterior Conditions

Note: The Forces shown in the tables above account for reactions associated with the exterior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 3.3 Maximum Horizontal Force (lbs) Multi span only Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 84 | 77 | 58 | 45 | 0 | 0 | 0 | 0 | 89 | 87 | 71 | 47 | 0 | 0 | 0 | 0 | 106 | 97 | 73 | 57 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 87 | 79 | 58 | 45 | 0 | 0 | 0 | 0 | 92 | 89 | 72 | 47 | 0 | 0 | 0 | 0 | 109 | 99 | 72 | 56 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 186 | 170 | 125 | 97 | 77 | 62 | 53 | 45 | 198 | 192 | 156 | 124 | 103 | 87 | 73 | 63 | 234 | 214 | 172 | 144 | 120 | 103 | 88 | 76 | |
| | 80 | 211 | 192 | 150 | 122 | 100 | 81 | 68 | 59 | 223 | 217 | 178 | 149 | 129 | 112 | 95 | 81 | 265 | 242 | 195 | 166 | 145 | 128 | 114 | 98 | |
| | 100 | 44-X | 88 | 84 | 67 | 0 | 0 | 0 | 0 | 92 | 90 | 70 | 0 | 0 | 0 | 0 | 0 | 110 | 106 | 84 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | 90 | 87 | 66 | 0 | 0 | 0 | 0 | 0 | 95 | 93 | 69 | 0 | 0 | 0 | 0 | 0 | 114 | 109 | 83 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 194 | 186 | 143 | 113 | 126 | 77 | 65 | 56 | 203 | 199 | 174 | 143 | 120 | 103 | 90 | 78 | 244 | 234 | 188 | 163 | 139 | 120 | 106 | 94 | |
| | 80 | 219 | 211 | 168 | 140 | 161 | 100 | 84 | 73 | 230 | 225 | 196 | 168 | 146 | 130 | 117 | 101 | 276 | 265 | 213 | 184 | 163 | 146 | 132 | 120 | |
| | 110 | 44-X | 90 | 88 | 74 | 0 | 0 | 0 | 0 | 94 | 92 | 77 | 0 | 0 | 0 | 0 | 0 | 114 | 111 | 93 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 93 | 91 | 75 | 0 | 0 | 0 | 0 | 0 | 97 | 94 | 78 | 0 | 0 | 0 | 0 | 0 | 117 | 114 | 94 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 200 | 194 | 161 | 129 | 146 | 92 | 78 | 68 | 208 | 204 | 188 | 162 | 137 | 119 | 105 | 94 | 251 | 244 | 203 | 178 | 157 | 137 | 122 | 85 | |
| | 80 | 226 | 220 | 185 | 156 | 182 | 119 | 102 | 88 | 235 | 231 | 213 | 184 | 163 | 146 | 132 | 121 | 284 | 277 | 232 | 201 | 179 | 162 | 148 | 136 | |
| | 120 | 44-X | 93 | 90 | 0 | 0 | 0 | 0 | 0 | 96 | 94 | 0 | 0 | 0 | 0 | 0 | 0 | 116 | 114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 95 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 99 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 204 | 200 | 177 | 145 | 165 | 105 | 93 | 81 | 213 | 208 | 201 | 176 | 153 | 134 | 119 | 107 | 257 | 251 | 222 | 191 | 172 | 154 | 117 | 101 | |
| 120 | 80 | 231 | 226 | 200 | 171 | 202 | 133 | 120 | 104 | 241 | 235 | 227 | 200 | 178 | 161 | 147 | 135 | 291 | 284 | 251 | 216 | 195 | 177 | 163 | 151 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 208 | 204 | 189 | 160 | 184 | 118 | 105 | 94 | 217 | 212 | 207 | 188 | 169 | 149 | 133 | 98 | 262 | 257 | 237 | 202 | 184 | 149 | 132 | 118 | |
| | 80 | 236 | 231 | 213 | 185 | 221 | 146 | 133 | 121 | 245 | 240 | 234 | 213 | 192 | 175 | 160 | 148 | 296 | 290 | 268 | 233 | 208 | 191 | 177 | 164 | |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 211 | 208 | 199 | 174 | 202 | 131 | 116 | 105 | 220 | 216 | 210 | 199 | 181 | 164 | 121 | 109 | 266 | 261 | 251 | 219 | 188 | 165 | 146 | 132 | |
| | 80 | 239 | 235 | 225 | 198 | 238 | 159 | 145 | 133 | 249 | 244 | 238 | 225 | 205 | 188 | 173 | 161 | 301 | 295 | 283 | 249 | 222 | 204 | 190 | 167 | |
| | 140 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 214 | 211 | 206 | 185 | 220 | 143 | 128 | 0 | 223 | 219 | 214 | 209 | 169 | 149 | 133 | 0 | 269 | 265 | 259 | 233 | 205 | 180 | 161 | 0 | |
| | 80 | 242 | 238 | 233 | 210 | 254 | 171 | 157 | 145 | 252 | 248 | 242 | 236 | 216 | 200 | 185 | 173 | 304 | 299 | 293 | 264 | 237 | 216 | 197 | 182 | |
| | 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 216 | 213 | 209 | 195 | 237 | 155 | 0 | 0 | 225 | 222 | 217 | 203 | 182 | 162 | 0 | 0 | 272 | 268 | 262 | 245 | 220 | 195 | 0 | 0 | |
| | 80 | 244 | 241 | 236 | 220 | 270 | 182 | 168 | 156 | 254 | 251 | 246 | 240 | 227 | 211 | 175 | 162 | 307 | 303 | 297 | 277 | 251 | 229 | 211 | 196 | |
| | 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 218 | 215 | 211 | 204 | 251 | 0 | 0 | 0 | 227 | 224 | 220 | 212 | 193 | 0 | 0 | 0 | 274 | 271 | 266 | 256 | 233 | 0 | 0 | 0 | |
| 180 | 80 | 247 | 243 | 239 | 230 | 283 | 193 | 179 | 166 | 256 | 253 | 249 | 242 | 237 | 201 | 186 | 173 | 310 | 306 | 300 | 289 | 264 | 243 | 225 | 209 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 220 | 217 | 213 | 210 | 0 | 0 | 0 | 0 | 228 | 226 | 222 | 218 | 0 | 0 | 0 | 0 | 276 | 273 | 268 | 264 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 248 | 246 | 241 | 238 | 296 | 203 | 189 | 0 | 258 | 255 | 251 | 247 | 228 | 211 | 196 | 0 | 312 | 309 | 304 | 299 | 276 | 255 | 237 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 3.3A Maximum Horizontal Force (lbs) Multi span only Exterior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 67 | 67 | 59 | 47 | 0 | 0 | 0 | 0 | 70 | 70 | 66 | 49 | 0 | 0 | 0 | 0 | 85 | 85 | 75 | 59 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 74 | 74 | 59 | 46 | 0 | 0 | 0 | 0 | 77 | 77 | 72 | 47 | 0 | 0 | 0 | 0 | 93 | 93 | 74 | 57 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 174 | 164 | 127 | 98 | 78 | 63 | 53 | 46 | 181 | 170 | 151 | 126 | 105 | 88 | 74 | 64 | 219 | 206 | 165 | 141 | 122 | 104 | 89 | 77 | 77 |
| | 80 | 211 | 192 | 150 | 119 | 94 | 76 | 64 | 56 | 223 | 217 | 178 | 149 | 126 | 106 | 90 | 77 | 265 | 242 | 195 | 166 | 145 | 126 | 108 | 93 | 93 |
| | 44-X | 66 | 66 | 66 | 0 | 0 | 0 | 0 | 0 | 69 | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 83 | 83 | 83 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 73 | 73 | 67 | 0 | 0 | 0 | 0 | 0 | 76 | 76 | 70 | 0 | 0 | 0 | 0 | 0 | 91 | 91 | 85 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 171 | 171 | 143 | 115 | 95 | 78 | 66 | 57 | 178 | 178 | 167 | 143 | 122 | 105 | 92 | 79 | 215 | 215 | 179 | 157 | 138 | 122 | 108 | 95 | 95 |
| | 80 | 219 | 211 | 168 | 139 | 115 | 94 | 79 | 69 | 230 | 225 | 196 | 168 | 146 | 127 | 111 | 95 | 276 | 265 | 213 | 184 | 163 | 146 | 130 | 115 | 115 |
| | 44-X | 65 | 65 | 65 | 0 | 0 | 0 | 0 | 0 | 68 | 68 | 68 | 0 | 0 | 0 | 0 | 0 | 82 | 82 | 82 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 72 | 72 | 72 | 0 | 0 | 0 | 0 | 0 | 75 | 75 | 75 | 0 | 0 | 0 | 0 | 0 | 90 | 90 | 90 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 168 | 168 | 157 | 131 | 109 | 94 | 80 | 69 | 175 | 175 | 165 | 157 | 138 | 121 | 107 | 95 | 212 | 212 | 197 | 165 | 152 | 138 | 124 | 86 | 86 |
| | 80 | 226 | 220 | 185 | 156 | 132 | 113 | 96 | 83 | 235 | 230 | 213 | 184 | 163 | 146 | 129 | 115 | 284 | 277 | 232 | 201 | 179 | 162 | 148 | 134 | 134 |
| 110 | 44-X | 65 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 81 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 71 | 71 | 0 | 0 | 0 | 0 | 0 | 0 | 74 | 74 | 0 | 0 | 0 | 0 | 0 | 0 | 89 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 167 | 167 | 167 | 145 | 124 | 107 | 94 | 82 | 173 | 173 | 173 | 164 | 151 | 136 | 121 | 109 | 210 | 210 | 210 | 183 | 163 | 151 | 118 | 103 | 103 |
| | 80 | 231 | 226 | 200 | 171 | 150 | 129 | 114 | 99 | 241 | 235 | 227 | 200 | 178 | 161 | 146 | 132 | 291 | 284 | 251 | 216 | 195 | 177 | 163 | 151 | 151 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 165 | 165 | 165 | 157 | 138 | 120 | 106 | 95 | 172 | 172 | 172 | 164 | 163 | 149 | 135 | 99 | 208 | 208 | 208 | 198 | 174 | 151 | 134 | 120 | 120 |
| | 80 | 230 | 230 | 213 | 185 | 163 | 145 | 128 | 115 | 239 | 239 | 227 | 213 | 192 | 175 | 160 | 148 | 289 | 289 | 268 | 233 | 208 | 191 | 177 | 164 | 164 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 164 | 164 | 164 | 164 | 150 | 133 | 118 | 107 | 171 | 171 | 171 | 163 | 160 | 123 | 111 | 207 | 207 | 207 | 207 | 189 | 167 | 149 | 134 | 134 | |
| | 80 | 229 | 229 | 225 | 198 | 176 | 159 | 143 | 129 | 238 | 238 | 235 | 225 | 205 | 188 | 173 | 161 | 287 | 287 | 283 | 249 | 222 | 204 | 190 | 162 | 162 |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 165 | 165 | 165 | 157 | 138 | 120 | 106 | 95 | 172 | 172 | 172 | 164 | 163 | 149 | 135 | 99 | 208 | 208 | 208 | 198 | 174 | 151 | 134 | 120 | 120 |
| | 80 | 230 | 230 | 213 | 185 | 163 | 145 | 128 | 115 | 239 | 239 | 227 | 213 | 192 | 175 | 160 | 148 | 289 | 289 | 268 | 233 | 208 | 191 | 177 | 164 | 164 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 164 | 164 | 164 | 164 | 150 | 133 | 118 | 107 | 171 | 171 | 171 | 163 | 160 | 123 | 111 | 207 | 207 | 207 | 207 | 189 | 167 | 149 | 134 | 134 | |
| | 80 | 229 | 229 | 225 | 198 | 176 | 159 | 143 | 129 | 238 | 238 | 235 | 225 | 205 | 188 | 173 | 161 | 287 | 287 | 283 | 249 | 222 | 204 | 190 | 162 | 162 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 164 | 164 | 164 | 164 | 160 | 145 | 130 | 0 | 170 | 170 | 170 | 167 | 151 | 135 | 0 | 206 | 206 | 206 | 206 | 201 | 183 | 164 | 0 | 0 | |
| | 80 | 227 | 227 | 227 | 210 | 188 | 171 | 157 | 142 | 237 | 237 | 237 | 225 | 216 | 200 | 185 | 173 | 286 | 286 | 286 | 264 | 237 | 216 | 197 | 179 | 179 |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 164 | 164 | 164 | 164 | 160 | 145 | 130 | 0 | 170 | 170 | 170 | 167 | 151 | 135 | 0 | 206 | 206 | 206 | 206 | 201 | 183 | 164 | 0 | 0 | |
| | 80 | 227 | 227 | 227 | 220 | 200 | 182 | 168 | 155 | 236 | 236 | 236 | 229 | 225 | 211 | 175 | 162 | 285 | 285 | 285 | 277 | 251 | 229 | 211 | 195 | 195 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 162 | 162 | 162 | 162 | 162 | 0 | 0 | 0 | 169 | 169 | 169 | 169 | 169 | 0 | 0 | 0 | 204 | 204 | 204 | 204 | 204 | 0 | 0 | 0 | 0 |
| | 80 | 227 | 227 | 227 | 220 | 200 | 182 | 168 | 155 | 234 | 234 | 234 | 229 | 225 | 211 | 175 | 162 | 285 | 285 | 285 | 277 | 251 | 229 | 211 | 195 | 195 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 162 | 162 | 162 | 162 | 162 | 0 | 0 | 0 | 169 | 169 | 169 | 169 | 169 | 0 | 0 | 0 | 204 | 204 | 204 | 204 | 204 | 0 | 0 | 0 | 0 |
| | 80 | 226 | 226 | 226 | 226 | 210 | 193 | 179 | 166 | 235 | 235 | 235 | 235 | 224 | 201 | 186 | 173 | 284 | 284 | 284 | 284 | 264 | 243 | 225 | 209 | 209 |
| 170 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 162 | 162 | 162 | 162 | 162 | 0 | 0 | 0 | 168 | 168 | 168 | 168 | 168 | 0 | 0 | 0 | 203 | 203 | 203 | 203 | 203 | 0 | 0 | 0 | 0 |
| | 8 | | | | | | | | | | | | | | | | | | | | | | | | | |



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.4 Max Uplift Force (lbs) Multi span only Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|---|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | |
| 90 | 44-X | -157 | -143 | -108 | -84 | 0 | 0 | 0 | 0 | -173 | -168 | -138 | 0 | 0 | 0 | 0 | 0 | -181 | -177 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -161 | -146 | -107 | -83 | 0 | 0 | 0 | 0 | -178 | -173 | -140 | 0 | 0 | 0 | 0 | 0 | -186 | -182 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -346 | -316 | -231 | -180 | -143 | -116 | -97 | -84 | -382 | -372 | -303 | -240 | -199 | -168 | -142 | -122 | -400 | -390 | -339 | -284 | -236 | -203 | -174 | -150 | | |
| | | 80 | -391 | -357 | -277 | -227 | -185 | -150 | -126 | -109 | -432 | -420 | -345 | -289 | -249 | -217 | -183 | -158 | -452 | -442 | -384 | -327 | -285 | -253 | -225 | -194 | |
| | | -168 | -161 | -128 | 0 | 0 | 0 | 0 | 0 | -182 | -178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 100 | 48-X | -173 | -166 | -126 | 0 | 0 | 0 | 0 | 0 | -187 | -183 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -370 | -356 | -274 | -216 | -179 | -147 | -124 | -107 | -402 | -392 | -343 | -283 | -237 | -204 | -178 | -223 | -417 | -409 | -377 | -327 | -278 | -241 | -213 | -188 | | |
| | | 80 | -419 | -402 | -321 | -267 | -228 | -191 | -160 | -138 | -455 | -444 | -388 | -331 | -289 | -257 | -231 | -289 | -472 | -462 | -426 | -369 | -326 | -292 | -264 | -241 | |
| | | -176 | -172 | -144 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 182 | -177 | -145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 110 | 48-XL | -390 | -379 | -315 | -252 | -210 | -180 | -153 | -132 | -417 | -409 | -377 | -324 | -275 | -238 | -211 | -275 | -430 | -423 | -409 | -360 | -319 | -279 | -248 | 0 | 0 | |
| | | 80 | -441 | -429 | -360 | -304 | -263 | -232 | -198 | -171 | -472 | -462 | -426 | -370 | -326 | -292 | -265 | -353 | -487 | -478 | -463 | -407 | -364 | -329 | -300 | -276 | |
| | | -183 | -179 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 189 | -184 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -405 | -396 | -350 | -287 | -242 | -209 | -184 | -160 | -429 | -422 | -407 | -358 | -311 | -272 | -242 | -319 | -441 | -434 | -425 | -390 | -352 | -316 | 0 | 0 | 0 | |
| 120 | 48-XL | 80 | -458 | -448 | -396 | -339 | -296 | -263 | -237 | -207 | -485 | -477 | -460 | -404 | -361 | -326 | -297 | -400 | -498 | -491 | -480 | -441 | -398 | -363 | -333 | -308 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -418 | -409 | -378 | -321 | -273 | -237 | -210 | -188 | -439 | -432 | -423 | -385 | -346 | -305 | -273 | 0 | -449 | -443 | -435 | -417 | -380 | 0 | 0 | 0 | 0 | |
| | | 80 | -472 | -463 | -428 | -371 | -328 | -294 | -266 | -243 | -496 | -489 | -478 | -436 | -393 | -357 | -328 | -444 | -508 | -501 | -492 | -471 | -429 | -394 | -365 | -339 | |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -418 | -409 | -378 | -321 | -273 | -237 | -210 | -188 | -439 | -432 | -423 | -385 | -346 | -305 | -273 | 0 | -449 | -443 | -435 | -417 | -380 | 0 | 0 | 0 | 0 | |
| | | 80 | -472 | -463 | -428 | -371 | -328 | -294 | -266 | -243 | -496 | -489 | -478 | -436 | -393 | -357 | -328 | -444 | -508 | -501 | -492 | -471 | -429 | -394 | -365 | -339 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 140 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -428 | -420 | -404 | -353 | -303 | -265 | -236 | -212 | -447 | -441 | -432 | -410 | -373 | -337 | 0 | 0 | -456 | -450 | -443 | -436 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -484 | -476 | -456 | -401 | -357 | -322 | -293 | -269 | -505 | -499 | -489 | -464 | -422 | -386 | -357 | -486 | -515 | -509 | -501 | -493 | -457 | -423 | -394 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 150 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -437 | -430 | -420 | -378 | -332 | -293 | -262 | 0 | -453 | -448 | -440 | -432 | 0 | 0 | 0 | 0 | 0 | -456 | -450 | -443 | -436 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -494 | -486 | -475 | -428 | -385 | -349 | -320 | -295 | -513 | -507 | -498 | -489 | -448 | -413 | -384 | -526 | -521 | -516 | -509 | -502 | -483 | -449 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 160 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -444 | -438 | -429 | -400 | -360 | -319 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -502 | -495 | -485 | -453 | -410 | -375 | -345 | -320 | -519 | -513 | -506 | -498 | -472 | -438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 170 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -450 | -444 | -436 | -420 | -383 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -509 | -502 | -493 | -475 | -433 | -398 | -369 | -343 | -524 | -519 | -512 | -505 | -493 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 180 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | -455 | -450 | -442 | -435 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 80 | -515 | -509 | -500 | -492 | -455 | -420 | -391 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 3.4A Max Uplift Force (lbs) Multi span only Exterior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | -125 | -125 | -110 | -88 | 0 | 0 | 0 | 0 | -127 | -127 | -127 | 0 | 0 | 0 | 0 | 0 | -128 | -128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -137 | -137 | -109 | -84 | 0 | 0 | 0 | 0 | -140 | -140 | -140 | 0 | 0 | 0 | 0 | 0 | -140 | -140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -323 | -304 | -235 | -183 | -145 | -118 | -99 | -85 | -328 | -328 | -293 | -244 | -202 | -170 | -144 | -124 | -330 | -330 | -326 | -278 | -240 | -206 | -176 | -152 | -152 |
| | | 80 | -391 | -357 | -277 | -220 | -175 | -142 | -119 | -103 | -432 | -420 | -345 | -289 | -244 | -205 | -173 | -149 | -452 | -442 | -384 | -327 | -285 | -248 | -213 | -184 |
| | | -44-X | -126 | -126 | -126 | 0 | 0 | 0 | 0 | -128 | -128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | -139 | -139 | -129 | 0 | 0 | 0 | 0 | 0 | -141 | -141 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -326 | -326 | -273 | -220 | -181 | -149 | -126 | -108 | -330 | -330 | -330 | -282 | -241 | -208 | -181 | -152 | -127 | -332 | -332 | -314 | -277 | -245 | -216 | -191 | -191 |
| | | 80 | -419 | -402 | -321 | -265 | -219 | -180 | -152 | -131 | -455 | -444 | -388 | -331 | -289 | -250 | -218 | -187 | -461 | -461 | -426 | -369 | -326 | -292 | -261 | -230 |
| | | -44-X | -127 | -127 | -127 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | -140 | -140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | -329 | -329 | -306 | -256 | -214 | -183 | -155 | -134 | -332 | -332 | -332 | -314 | -277 | -242 | -214 | -187 | -279 | -333 | -333 | -333 | -309 | -280 | -251 | 0 | 0 |
| | | 80 | -441 | -429 | -360 | -304 | -258 | -221 | -187 | -162 | -461 | -461 | -426 | -370 | -326 | -292 | -258 | -337 | -463 | -463 | -463 | -407 | -364 | -329 | -300 | -273 |
| | | -44-X | -128 | -128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | -141 | -141 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-XL | -330 | -330 | -330 | -288 | -246 | -212 | -187 | -162 | -333 | -333 | -333 | -333 | -307 | -276 | -246 | -324 | -334 | -334 | -334 | -309 | 0 | 0 | 0 | 0 |
| 120 | 80 | -458 | -448 | -396 | -339 | -296 | -256 | -225 | -196 | -463 | -463 | -460 | -404 | -361 | -326 | -296 | -390 | -465 | -465 | -465 | -441 | -398 | -363 | -333 | -308 | -308 |
| | | -44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-XL | -332 | -332 | -332 | -315 | -277 | -241 | -213 | -191 | -334 | -334 | -334 | -334 | -304 | -277 | 0 | -335 | -335 | -335 | -335 | -335 | 0 | 0 | 0 | 0 |
| | | 80 | -461 | -461 | -428 | -371 | -328 | -291 | -257 | -231 | -464 | -464 | -464 | -436 | -393 | -357 | -328 | -443 | -466 | -466 | -466 | -466 | -429 | -394 | -365 | -339 |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-XL | -332 | -332 | -332 | -315 | -277 | -241 | -213 | -191 | -334 | -334 | -334 | -334 | -304 | -277 | 0 | -335 | -335 | -335 | -335 | -335 | 0 | 0 | 0 | 0 |
| | | 80 | -461 | -461 | -428 | -371 | -328 | -291 | -257 | -231 | -464 | -464 | -464 | -436 | -393 | -357 | -328 | -443 | -466 | -466 | -466 | -466 | -429 | -394 | -365 | -339 |
| | | -48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | -333 | -333 | -333 | -333 | -304 | -269 | -240 | -216 | -335 | -335 | -335 | -335 | -304 | -277 | 0 | -335 | -335 | -335 | -335 | -335 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -463 | -463 | -456 | -401 | -357 | -322 | -289 | -260 | -465 | -465 | -465 | -465 | -422 | -386 | -357 | -486 | -466 | -466 | -466 | -466 | -457 | -423 | -394 | 0 |
| | | -44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-XL | -334 | -334 | -334 | -334 | -327 | -297 | -266 | 0 | -335 | -335 | -335 | -335 | -304 | -277 | 0 | -335 | -335 | -335 | -335 | -335 | 0 | 0 | 0 | 0 |
| 150 | 80 | -464 | -464 | -464 | -428 | -385 | -349 | -320 | -290 | -466 | -466 | -466 | -466 | -448 | -413 | -384 | -526 | -467 | -467 | -467 | -467 | -467 | -449 | 0 | 0 | 0 |
| | | -44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-XL | -334 | -334 | -334 | -334 | -318 | 0 | 0 | 0 | -0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -464 | -464 | -464 | -428 | -385 | -349 | -320 | -290 | -466 | -466 | -466 | -466 | -448 | -413 | -384 | -526 | -467 | -467 | -467 | -467 | -467 | -449 | 0 | 0 |
| 160 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-XL | -334 | -334 | -334 | -334 | -318 | 0 | 0 | 0 | -0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -465 | -465 | -465 | -453 | -410 | -375 | -345 | -319 | -467 | -467 | -467 | -467 | -438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-XL | -335 | -335 | -335 | -335 | 0 | 0 | 0 | 0 | -0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -466 | -466 | -466 | -466 | -433 | -398 | -369 | -343 | -467 | -467 | -467 | -467 | -438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | -335 | -335 | -335 | -335 | 0 | 0 | 0 | 0 | 0 | -0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -466 | -466 | -466 | -466 | -455 | -420 | -391 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the exterior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.5 Max Length L (inches) for Single Span Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|---------------------------|----|----|----|----|----|----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 43 | 39 | 29 | 23 | 0 | 0 | 0 | 0 | 0 | 32 | 32 | 26 | 0 | 0 | 0 | 0 | 0 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 40 | 36 | 27 | 21 | 0 | 0 | 0 | 0 | 0 | 30 | 29 | 24 | 0 | 0 | 0 | 0 | 0 | 26 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 86 | 78 | 58 | 45 | 36 | 29 | 24 | 21 | 65 | 64 | 52 | 41 | 34 | 29 | 24 | 21 | 56 | 54 | 47 | 40 | 33 | 28 | 24 | 21 | |
| | 80 | 124 | 113 | 83 | 65 | 51 | 42 | 35 | 30 | 95 | 92 | 75 | 60 | 49 | 42 | 35 | 30 | 81 | 79 | 68 | 57 | 48 | 41 | 35 | 30 | |
| | 44-X | 36 | 37 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 33 | 34 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 72 | 72 | 54 | 42 | 35 | 29 | 24 | 21 | 55 | 53 | 47 | 39 | 33 | 28 | 24 | 21 | 46 | 45 | 42 | 36 | 31 | 27 | 24 | 21 | |
| | 80 | 105 | 103 | 77 | 61 | 50 | 42 | 35 | 30 | 79 | 77 | 68 | 56 | 47 | 40 | 35 | 30 | 67 | 66 | 60 | 52 | 45 | 39 | 34 | 30 | |
| | 44-X | 30 | 30 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-X | 28 | 31 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 61 | 65 | 50 | 40 | 33 | 29 | 24 | 21 | 46 | 45 | 42 | 36 | 31 | 27 | 24 | 21 | 39 | 38 | 37 | 33 | 29 | 25 | 23 | 0 | |
| | 80 | 89 | 94 | 72 | 58 | 48 | 41 | 35 | 30 | 67 | 66 | 60 | 52 | 44 | 38 | 34 | 30 | 56 | 55 | 54 | 47 | 42 | 37 | 32 | 29 | |
| | 44-X | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-X | 24 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 53 | 59 | 46 | 38 | 32 | 27 | 24 | 21 | 39 | 39 | 37 | 33 | 29 | 25 | 22 | 20 | 33 | 33 | 32 | 29 | 27 | 24 | 0 | 0 | |
| | 80 | 77 | 85 | 66 | 54 | 46 | 39 | 35 | 30 | 57 | 56 | 54 | 48 | 41 | 36 | 32 | 29 | 48 | 47 | 46 | 43 | 38 | 34 | 31 | 28 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 46 | 54 | 42 | 36 | 30 | 26 | 23 | 21 | 34 | 34 | 33 | 30 | 27 | 24 | 21 | 0 | 29 | 28 | 28 | 27 | 24 | 0 | 0 | 0 | |
| | 80 | 66 | 78 | 60 | 51 | 43 | 38 | 33 | 30 | 49 | 49 | 48 | 43 | 39 | 34 | 31 | 28 | 41 | 41 | 40 | 38 | 35 | 32 | 29 | 27 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 40 | 49 | 38 | 33 | 29 | 25 | 22 | 20 | 30 | 29 | 29 | 27 | 25 | 23 | 0 | 0 | 25 | 25 | 24 | 24 | 0 | 0 | 0 | 0 | |
| | 80 | 58 | 67 | 55 | 48 | 41 | 36 | 32 | 29 | 43 | 43 | 42 | 40 | 36 | 32 | 29 | 27 | 36 | 36 | 35 | 35 | 32 | 30 | 28 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 35 | 43 | 34 | 31 | 27 | 24 | 21 | 0 | 26 | 26 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 51 | 58 | 49 | 44 | 39 | 34 | 31 | 28 | 38 | 37 | 36 | 33 | 31 | 28 | 25 | 32 | 31 | 31 | 30 | 29 | 27 | 0 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 31 | 38 | 30 | 28 | 26 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 46 | 51 | 44 | 41 | 37 | 33 | 29 | 27 | 34 | 33 | 32 | 30 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 28 | 33 | 27 | 26 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 41 | 45 | 39 | 38 | 35 | 31 | 28 | 26 | 30 | 30 | 29 | 29 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 25 | 30 | 25 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 37 | 40 | 36 | 35 | 32 | 30 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
 See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 3.5A Max Length L (inches) for Single Span Exterior Conditions

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC

PV Tilt Up Kit Solar PV Mount System

Standard size 43.2"x 80" Portrait Orientation

Table 3.6 Maximum Downward Force (lbs) Single span only Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 97 | 103 | 90 | 79 | 0 | 0 | 0 | 0 | 96 | 98 | 91 | 0 | 0 | 0 | 0 | 0 | 92 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 90 | 95 | 84 | 74 | 0 | 0 | 0 | 0 | 90 | 90 | 84 | 0 | 0 | 0 | 0 | 0 | 90 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 194 | 207 | 177 | 156 | 98 | 93 | 86 | 60 | 195 | 196 | 181 | 124 | 111 | 103 | 73 | 71 | 196 | 191 | 166 | 140 | 117 | 100 | 86 | 79 | |
| | 80 | 282 | 300 | 255 | 224 | 141 | 134 | 124 | 86 | 283 | 283 | 261 | 178 | 160 | 147 | 105 | 102 | 284 | 277 | 241 | 201 | 169 | 144 | 123 | 114 | |
| | 44-X | 97 | 107 | 96 | 0 | 0 | 0 | 0 | 0 | 92 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 90 | 100 | 90 | 0 | 0 | 0 | 0 | 0 | 90 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 195 | 210 | 190 | 171 | 108 | 105 | 98 | 67 | 196 | 191 | 187 | 139 | 118 | 113 | 88 | 81 | 196 | 192 | 177 | 154 | 132 | 114 | 101 | 91 | |
| | 80 | 283 | 302 | 272 | 245 | 155 | 151 | 141 | 96 | 284 | 277 | 271 | 200 | 170 | 162 | 126 | 116 | 284 | 279 | 257 | 223 | 190 | 164 | 145 | 131 | |
| | 44-X | 95 | 96 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 90 | 100 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 196 | 211 | 201 | 185 | 114 | 118 | 111 | 74 | 196 | 192 | 193 | 154 | 130 | 122 | 100 | 91 | 197 | 193 | 187 | 165 | 147 | 128 | 114 | 0 | |
| | 80 | 283 | 303 | 289 | 266 | 164 | 169 | 160 | 107 | 284 | 279 | 279 | 221 | 187 | 175 | 144 | 131 | 285 | 280 | 271 | 239 | 211 | 185 | 164 | 147 | |
| | 44-X | 91 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 90 | 104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 196 | 220 | 209 | 200 | 120 | 126 | 125 | 82 | 197 | 193 | 198 | 164 | 144 | 130 | 112 | 101 | 197 | 194 | 190 | 174 | 157 | 142 | 0 | 0 | |
| | 80 | 284 | 316 | 302 | 287 | 172 | 182 | 180 | 119 | 285 | 280 | 286 | 237 | 206 | 188 | 161 | 144 | 285 | 281 | 275 | 253 | 228 | 204 | 183 | 165 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-XL | 196 | 231 | 215 | 213 | 129 | 135 | 135 | 91 | 197 | 194 | 197 | 173 | 156 | 139 | 123 | 0 | 197 | 195 | 191 | 183 | 167 | 0 | 0 | 0 | |
| | 80 | 284 | 332 | 311 | 306 | 186 | 194 | 194 | 130 | 285 | 281 | 286 | 250 | 225 | 200 | 177 | 160 | 286 | 282 | 277 | 265 | 242 | 222 | 201 | 183 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 197 | 241 | 220 | 225 | 140 | 144 | 145 | 98 | 197 | 195 | 195 | 181 | 164 | 150 | 0 | 0 | 197 | 195 | 192 | 189 | 0 | 0 | 0 | 0 | |
| | 80 | 285 | 328 | 319 | 325 | 202 | 207 | 209 | 141 | 286 | 282 | 282 | 262 | 238 | 215 | 194 | 176 | 286 | 283 | 278 | 274 | 254 | 235 | 218 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 197 | 241 | 221 | 234 | 151 | 152 | 155 | 0 | 197 | 195 | 193 | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 285 | 322 | 321 | 338 | 217 | 219 | 223 | 154 | 286 | 283 | 280 | 273 | 250 | 230 | 209 | 191 | 286 | 283 | 279 | 275 | 265 | 247 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 197 | 238 | 220 | 241 | 161 | 161 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 285 | 317 | 318 | 349 | 232 | 231 | 237 | 167 | 286 | 283 | 279 | 275 | 260 | 241 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 197 | 235 | 218 | 248 | 168 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 286 | 313 | 316 | 359 | 243 | 242 | 251 | 180 | 286 | 284 | 280 | 276 | 270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 197 | 232 | 217 | 252 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 80 | 286 | 310 | 315 | 366 | 253 | 253 | 264 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.
See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.6A Maximum Downward Force (lbs) Single span only Exterior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 75 | 88 | 84 | 74 | 0 | 0 | 0 | 0 | 69 | 71 | 81 | 0 | 0 | 0 | 0 | 0 | 67 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 78 | 91 | 85 | 75 | 0 | 0 | 0 | 0 | 72 | 74 | 84 | 0 | 0 | 0 | 0 | 0 | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 183 | 205 | 176 | 155 | 98 | 93 | 86 | 59 | 169 | 174 | 180 | 123 | 110 | 102 | 72 | 71 | 163 | 163 | 163 | 139 | 117 | 99 | 85 | 79 | |
| | | 80 | 254 | 295 | 255 | 224 | 141 | 134 | 124 | 86 | 235 | 242 | 258 | 178 | 160 | 147 | 105 | 102 | 226 | 226 | 226 | 201 | 169 | 144 | 123 | 114 |
| | 48-X | 71 | 77 | 90 | 0 | 0 | 0 | 0 | 0 | 67 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 74 | 80 | 90 | 0 | 0 | 0 | 0 | 0 | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 173 | 187 | 188 | 169 | 107 | 104 | 97 | 66 | 162 | 162 | 182 | 138 | 117 | 112 | 87 | 80 | 157 | 157 | 157 | 153 | 131 | 113 | 100 | 90 | |
| | | 80 | 241 | 260 | 272 | 245 | 155 | 151 | 141 | 96 | 226 | 226 | 253 | 200 | 170 | 162 | 126 | 116 | 219 | 219 | 219 | 219 | 190 | 164 | 145 | 131 |
| | | 44-X | 68 | 69 | 86 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 71 | 72 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 166 | 169 | 200 | 184 | 113 | 117 | 111 | 74 | 157 | 157 | 171 | 152 | 129 | 121 | 99 | 90 | 153 | 153 | 153 | 153 | 146 | 127 | 113 | 0 | |
| | | 80 | 231 | 235 | 288 | 266 | 164 | 169 | 160 | 107 | 219 | 219 | 238 | 219 | 187 | 175 | 144 | 131 | 213 | 213 | 213 | 213 | 210 | 185 | 164 | 147 |
| 110 | 44-X | 66 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 161 | 161 | 199 | 198 | 119 | 125 | 124 | 82 | 154 | 154 | 163 | 154 | 143 | 129 | 111 | 100 | 151 | 151 | 151 | 151 | 151 | 141 | 0 | 0 | 0 |
| | | 80 | 224 | 224 | 276 | 287 | 172 | 182 | 180 | 119 | 214 | 214 | 227 | 214 | 206 | 188 | 161 | 144 | 209 | 209 | 209 | 209 | 204 | 183 | 165 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 157 | 157 | 190 | 212 | 128 | 134 | 134 | 90 | 151 | 151 | 157 | 151 | 151 | 138 | 122 | 0 | 148 | 148 | 148 | 148 | 148 | 148 | 0 | 0 | 0 |
| | | 80 | 219 | 219 | 264 | 306 | 186 | 194 | 194 | 130 | 210 | 210 | 218 | 210 | 210 | 200 | 177 | 160 | 206 | 206 | 206 | 206 | 206 | 206 | 201 | 183 |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 214 | 214 | 254 | 297 | 202 | 207 | 209 | 141 | 207 | 207 | 212 | 207 | 207 | 207 | 194 | 176 | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 0 | |
| | | 80 | 211 | 211 | 246 | 289 | 211 | 219 | 223 | 154 | 205 | 205 | 206 | 205 | 205 | 205 | 191 | 202 | 202 | 202 | 202 | 202 | 202 | 202 | 0 | |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 157 | 157 | 190 | 212 | 128 | 134 | 134 | 90 | 151 | 151 | 157 | 151 | 151 | 138 | 122 | 0 | 148 | 148 | 148 | 148 | 148 | 148 | 0 | 0 | 0 |
| | | 80 | 219 | 219 | 264 | 306 | 186 | 194 | 194 | 130 | 210 | 210 | 218 | 210 | 210 | 200 | 177 | 160 | 206 | 206 | 206 | 206 | 206 | 206 | 201 | 183 |
| | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 154 | 154 | 183 | 213 | 139 | 143 | 144 | 98 | 149 | 149 | 152 | 149 | 149 | 149 | 0 | 0 | 146 | 146 | 146 | 146 | 146 | 146 | 0 | 0 | 0 |
| | | 80 | 214 | 214 | 254 | 297 | 202 | 207 | 209 | 141 | 207 | 207 | 212 | 207 | 207 | 207 | 194 | 176 | 204 | 204 | 204 | 204 | 204 | 204 | 204 | 0 |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 152 | 152 | 177 | 208 | 150 | 151 | 154 | 0 | 147 | 147 | 148 | 147 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 211 | 211 | 246 | 289 | 211 | 219 | 223 | 154 | 205 | 205 | 206 | 205 | 205 | 205 | 191 | 202 | 202 | 202 | 202 | 202 | 202 | 202 | 0 | |
| 150 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 152 | 152 | 177 | 208 | 150 | 151 | 154 | 0 | 147 | 147 | 148 | 147 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 211 | 211 | 246 | 289 | 211 | 219 | 223 | 154 | 205 | 205 | 206 | 205 | 205 | 205 | 191 | 202 | 202 | 202 | 202 | 202 | 202 | 202 | 0 | |
| | 48-XL | 150 | 150 | 173 | 203 | 150 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 208 | 208 | 240 | 282 | 208 | 231 | 237 | 167 | 203 | 203 | 203 | 203 | 203 | 203 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 150 | 150 | 173 | 203 | 150 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 208 | 208 | 240 | 282 | 208 | 231 | 237 | 167 | 203 | 203 | 203 | 203 | 203 | 203 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 148 | 148 | 169 | 199 | 148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 206 | 206 | 235 | 277 | 206 | 228 | 251 | 180 | 201 | 201 | 201 | 201 | 201 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 148 | 148 | 169 | 199 | 148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | 206 | 206 | 235 | 277 | 206 | 228 | 251 | 180 | 201 | 201 | 201 | 201 | 201 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | |



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.7 Maximum Horizontal Force (lbs) Single span only Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|-----|-----|-----|-----|----|----|---------------------------|-----|-----|-----|-----|-----|----|---------------------------|-----|-----|-----|-----|-----|-----|-----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 37 | 34 | 25 | 20 | 0 | 0 | 0 | 0 | 39 | 38 | 31 | 20 | 0 | 0 | 0 | 0 | 47 | 42 | 32 | 25 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 34 | 31 | 24 | 18 | 0 | 0 | 0 | 0 | 36 | 35 | 29 | 19 | 0 | 0 | 0 | 0 | 43 | 39 | 30 | 23 | 0 | 0 | 0 | 0 | 0 |
| | 48-XL | 74 | 68 | 50 | 39 | 31 | 25 | 21 | 18 | 78 | 76 | 62 | 50 | 41 | 35 | 29 | 25 | 93 | 85 | 68 | 58 | 48 | 41 | 35 | 30 | 30 |
| | 80 | 107 | 98 | 72 | 56 | 44 | 36 | 30 | 26 | 114 | 110 | 90 | 71 | 59 | 50 | 42 | 36 | 135 | 123 | 99 | 83 | 69 | 59 | 51 | 44 | 44 |
| | 44-X | 38 | 39 | 29 | 0 | 0 | 0 | 0 | 0 | 40 | 40 | 30 | 0 | 0 | 0 | 0 | 0 | 48 | 49 | 37 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 34 | 31 | 24 | 18 | 0 | 0 | 0 | 0 | 36 | 35 | 29 | 19 | 0 | 0 | 0 | 0 | 43 | 39 | 30 | 23 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 77 | 77 | 57 | 45 | 37 | 31 | 26 | 22 | 81 | 80 | 69 | 57 | 48 | 41 | 36 | 31 | 97 | 96 | 75 | 65 | 56 | 48 | 42 | 38 | 38 |
| | 80 | 111 | 110 | 82 | 65 | 54 | 44 | 37 | 32 | 117 | 115 | 100 | 82 | 69 | 59 | 52 | 45 | 140 | 139 | 108 | 94 | 80 | 69 | 61 | 54 | 54 |
| | 44-X | 38 | 38 | 32 | 0 | 0 | 0 | 0 | 0 | 40 | 40 | 34 | 0 | 0 | 0 | 0 | 0 | 48 | 48 | 41 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 37 | 40 | 30 | 0 | 0 | 0 | 0 | 0 | 38 | 42 | 31 | 0 | 0 | 0 | 0 | 0 | 46 | 50 | 38 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 79 | 84 | 65 | 52 | 43 | 37 | 31 | 27 | 83 | 88 | 75 | 65 | 55 | 48 | 42 | 38 | 100 | 106 | 81 | 70 | 63 | 55 | 49 | 34 | 34 |
| | 80 | 115 | 121 | 93 | 74 | 62 | 53 | 45 | 39 | 120 | 126 | 108 | 93 | 79 | 68 | 60 | 54 | 144 | 152 | 117 | 102 | 90 | 79 | 70 | 63 | 63 |
| | 44-X | 38 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 37 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 81 | 91 | 70 | 58 | 49 | 42 | 37 | 32 | 84 | 95 | 80 | 70 | 61 | 54 | 48 | 43 | 102 | 115 | 88 | 76 | 68 | 62 | 47 | 41 | 41 |
| | 80 | 118 | 131 | 101 | 83 | 70 | 61 | 53 | 46 | 122 | 136 | 115 | 101 | 88 | 77 | 69 | 62 | 148 | 165 | 128 | 110 | 99 | 89 | 79 | 72 | 72 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 130 | 48-XL | 83 | 97 | 75 | 64 | 54 | 47 | 42 | 38 | 86 | 101 | 82 | 75 | 67 | 60 | 53 | 39 | 104 | 122 | 94 | 80 | 73 | 59 | 53 | 47 | 47 |
| | 80 | 120 | 140 | 108 | 92 | 78 | 68 | 60 | 54 | 125 | 145 | 119 | 108 | 97 | 86 | 77 | 69 | 150 | 176 | 136 | 116 | 106 | 97 | 88 | 80 | 80 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 140 | 48-XL | 84 | 103 | 79 | 69 | 60 | 52 | 47 | 42 | 87 | 107 | 83 | 79 | 72 | 65 | 48 | 44 | 105 | 129 | 99 | 87 | 75 | 66 | 59 | 53 | 53 |
| | 80 | 122 | 140 | 115 | 100 | 86 | 75 | 67 | 60 | 126 | 146 | 121 | 115 | 104 | 94 | 85 | 77 | 153 | 176 | 144 | 126 | 112 | 104 | 96 | 76 | 76 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 150 | 48-XL | 85 | 104 | 82 | 74 | 65 | 57 | 51 | 0 | 88 | 108 | 85 | 83 | 68 | 60 | 53 | 0 | 107 | 131 | 103 | 93 | 82 | 72 | 64 | 0 | |
| | 80 | 123 | 139 | 118 | 107 | 94 | 82 | 74 | 67 | 128 | 144 | 123 | 120 | 110 | 101 | 92 | 84 | 155 | 175 | 149 | 134 | 118 | 110 | 93 | 84 | 84 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 160 | 48-XL | 86 | 104 | 83 | 77 | 70 | 62 | 0 | 0 | 89 | 108 | 86 | 80 | 73 | 65 | 0 | 0 | 108 | 130 | 104 | 97 | 88 | 78 | 0 | 0 | |
| | 80 | 124 | 138 | 120 | 112 | 101 | 89 | 80 | 73 | 129 | 144 | 125 | 122 | 115 | 107 | 84 | 76 | 156 | 173 | 151 | 141 | 127 | 112 | 101 | 92 | 92 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 170 | 48-XL | 87 | 103 | 84 | 81 | 74 | 0 | 0 | 0 | 90 | 107 | 87 | 84 | 77 | 0 | 0 | 0 | 109 | 129 | 105 | 102 | 93 | 0 | 0 | 0 | |
| | 80 | 125 | 137 | 121 | 117 | 107 | 96 | 87 | 79 | 130 | 143 | 126 | 123 | 120 | 100 | 90 | 82 | 158 | 173 | 153 | 147 | 134 | 121 | 109 | 99 | 99 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 180 | 48-XL | 87 | 103 | 85 | 83 | 0 | 0 | 0 | 0 | 91 | 107 | 88 | 87 | 0 | 0 | 0 | 0 | 110 | 129 | 107 | 105 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 126 | 137 | 123 | 121 | 112 | 103 | 93 | 0 | 131 | 142 | 128 | 126 | 116 | 107 | 97 | 0 | 159 | 172 | 154 | 152 | 140 | 129 | 117 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.7A Maximum Horizontal Force (lbs) Single span only Exterior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|----|----|----|----|----|----|---------------------------|-----|----|----|----|----|-----|---------------------------|-----|-----|-----|-----|-----|-----|----|----|----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | 29 | 29 | 24 | 18 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 28 | 19 | 0 | 0 | 0 | 0 | 36 | 36 | 30 | 23 | 0 | 0 | 0 | 0 |
| | 48-X | 30 | 30 | 24 | 19 | 0 | 0 | 0 | 0 | 0 | 31 | 31 | 29 | 19 | 0 | 0 | 0 | 0 | 37 | 37 | 30 | 23 | 0 | 0 | 0 | 0 |
| | 48-XL | 70 | 67 | 49 | 38 | 31 | 25 | 21 | 18 | 72 | 70 | 62 | 49 | 41 | 34 | 29 | 25 | 88 | 84 | 67 | 57 | 48 | 41 | 35 | 30 | 30 |
| | 80 | 97 | 96 | 72 | 56 | 44 | 36 | 30 | 26 | 101 | 100 | 89 | 71 | 59 | 50 | 42 | 36 | 122 | 121 | 93 | 83 | 69 | 59 | 51 | 44 | 44 |
| | 44-X | 28 | 28 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 28 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 34 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 30 | 30 | 24 | 19 | 0 | 0 | 0 | 0 | 0 | 31 | 31 | 29 | 19 | 0 | 0 | 0 | 0 | 37 | 37 | 30 | 23 | 0 | 0 | 0 | 0 |
| | 48-XL | 68 | 68 | 57 | 45 | 37 | 31 | 26 | 22 | 71 | 71 | 67 | 57 | 48 | 41 | 36 | 31 | 86 | 86 | 72 | 64 | 55 | 48 | 42 | 37 | 37 |
| | 80 | 95 | 95 | 82 | 65 | 54 | 44 | 37 | 32 | 99 | 99 | 93 | 82 | 69 | 59 | 52 | 45 | 119 | 119 | 104 | 92 | 80 | 69 | 61 | 54 | 54 |
| | 44-X | 28 | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 35 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 36 | 36 | 36 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-XL | 67 | 67 | 64 | 51 | 43 | 37 | 31 | 27 | 70 | 70 | 67 | 64 | 54 | 47 | 42 | 37 | 85 | 85 | 80 | 66 | 62 | 55 | 48 | 34 | 34 |
| | 80 | 94 | 94 | 92 | 74 | 62 | 53 | 45 | 39 | 97 | 97 | 96 | 92 | 79 | 68 | 60 | 54 | 118 | 118 | 116 | 93 | 90 | 79 | 70 | 63 | 63 |
| | 44-X | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 34 | 34 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 36 | 36 | 36 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | 67 | 67 | 67 | 58 | 48 | 42 | 37 | 32 | 69 | 69 | 69 | 66 | 61 | 53 | 47 | 43 | 84 | 84 | 84 | 72 | 65 | 61 | 46 | 40 | 40 |
| | 80 | 93 | 93 | 93 | 83 | 70 | 61 | 53 | 46 | 96 | 96 | 96 | 91 | 88 | 77 | 69 | 62 | 117 | 117 | 117 | 105 | 91 | 89 | 79 | 72 | 72 |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 48-XL | 66 | 66 | 66 | 63 | 54 | 47 | 42 | 37 | 69 | 69 | 69 | 66 | 65 | 59 | 53 | 39 | 83 | 83 | 83 | 80 | 68 | 59 | 52 | 47 | 47 |
| | 80 | 92 | 92 | 92 | 92 | 78 | 68 | 60 | 54 | 96 | 96 | 96 | 91 | 86 | 77 | 69 | 116 | 116 | 116 | 116 | 98 | 90 | 88 | 80 | 80 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 48-XL | 66 | 66 | 66 | 66 | 59 | 52 | 46 | 42 | 68 | 68 | 68 | 65 | 65 | 48 | 43 | 83 | 83 | 83 | 83 | 75 | 65 | 58 | 52 | 52 | |
| | 80 | 91 | 91 | 91 | 91 | 86 | 75 | 67 | 60 | 95 | 95 | 95 | 90 | 90 | 85 | 77 | 115 | 115 | 115 | 115 | 108 | 95 | 90 | 76 | 76 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 65 | 65 | 65 | 65 | 57 | 51 | 0 | 0 | 68 | 68 | 68 | 67 | 59 | 53 | 0 | 82 | 82 | 82 | 82 | 81 | 72 | 64 | 0 | 0 | |
| | 80 | 91 | 91 | 91 | 91 | 82 | 74 | 67 | 59 | 95 | 95 | 95 | 95 | 90 | 90 | 84 | 114 | 114 | 114 | 114 | 104 | 93 | 84 | 84 | 84 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 65 | 65 | 65 | 65 | 57 | 51 | 0 | 0 | 68 | 68 | 68 | 67 | 59 | 53 | 0 | 82 | 82 | 82 | 82 | 81 | 72 | 64 | 0 | 0 | |
| | 80 | 91 | 91 | 91 | 91 | 82 | 74 | 67 | 59 | 95 | 95 | 95 | 95 | 90 | 90 | 84 | 114 | 114 | 114 | 114 | 104 | 93 | 84 | 84 | 84 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 65 | 65 | 65 | 65 | 62 | 0 | 0 | 0 | 68 | 68 | 68 | 68 | 64 | 0 | 0 | 82 | 82 | 82 | 82 | 82 | 78 | 0 | 0 | 0 | |
| | 80 | 91 | 91 | 91 | 91 | 89 | 80 | 73 | 94 | 94 | 94 | 94 | 93 | 84 | 76 | 114 | 114 | 114 | 114 | 114 | 112 | 101 | 92 | 92 | | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 65 | 65 | 65 | 65 | 65 | 0 | 0 | 0 | 68 | 68 | 68 | 68 | 68 | 0 | 0 | 82 | 82 | 82 | 82 | 82 | 82 | 0 | 0 | 0 | |
| | 80 | 90 | 90 | 90 | 90 | 90 | 90 | 87 | 79 | 94 | 94 | 94 | 94 | 94 | 94 | 90 | 82 | 114 | 114 | 114 | 114 | 114 | 109 | 99 | 99 | |
| | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 48-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 65 | 65 | 65 | 65 | 0 | 0 | 0 | 0 | 67 | 67 | 67 | 67 | 0 | 0 | 0 | 81 | 81 | 81 | 81 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 | 90 | 90 | 90 | 90 | 90 | 90 | 93 | 0 | 94 | 94 | 94 | 94 | 94 | 94 | 97 | 0 | 113 | 113 | 113 | 113 | 113 | 117 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.8 Max Uplift Force (lbs) Single span only Interior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|------|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | -69 | -63 | -47 | -37 | 0 | 0 | 0 | 0 | -120 | -74 | -60 | 0 | 0 | 0 | 0 | 0 | -75 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -63 | -58 | -44 | -34 | 0 | 0 | 0 | 0 | -113 | -68 | -56 | 0 | 0 | 0 | 0 | 0 | -73 | -72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -137 | -125 | -92 | -72 | -57 | -46 | -39 | -34 | -244 | -148 | -121 | -96 | -80 | -67 | -57 | -49 | -159 | -155 | -135 | -113 | -94 | -81 | -69 | -60 | |
| | | 80 | -199 | -181 | -133 | -103 | -82 | -67 | -56 | -48 | -354 | -214 | -174 | -138 | -115 | -96 | -81 | -70 | -230 | -224 | -195 | -163 | -136 | -117 | -100 | -86 |
| | | -73 | -74 | -56 | 0 | 0 | 0 | 0 | 0 | -95 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | -68 | -69 | -52 | 0 | 0 | 0 | 0 | 0 | -94 | -72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -147 | -146 | -110 | -86 | -71 | -59 | -50 | -43 | -204 | -156 | -136 | -113 | -95 | -82 | -71 | -61 | -166 | -162 | -150 | -130 | -111 | -96 | -85 | -75 | |
| | | 80 | -213 | -210 | -157 | -124 | -103 | -85 | -71 | -61 | -295 | -226 | -197 | -163 | -136 | -118 | -103 | -88 | -240 | -235 | -217 | -188 | -160 | -139 | -122 | -108 |
| | | -75 | -75 | -63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -71 | -78 | -58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | -155 | -348 | -325 | -293 | -269 | -250 | -235 | -220 | -438 | -431 | -420 | -393 | -364 | -341 | -321 | -305 | -490 | -483 | -474 | -454 | -430 | -405 | -383 | -364 | |
| | | 80 | -224 | -236 | -181 | -145 | -121 | -104 | -88 | -76 | -249 | -235 | -217 | -186 | -158 | -137 | -121 | -108 | -247 | -243 | -235 | -207 | -183 | -160 | -142 | -128 |
| | | -75 | -75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -74 | -86 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -161 | -181 | -139 | -115 | -97 | -84 | -74 | -64 | -170 | -167 | -161 | -142 | -124 | -109 | -97 | -87 | -175 | -172 | -169 | -155 | -140 | -126 | 0 | 0 | |
| 120 | 48-XL | 80 | -233 | -260 | -201 | -165 | -139 | -120 | -106 | -92 | -247 | -242 | -234 | -206 | -179 | -156 | -139 | -125 | -253 | -250 | -244 | -224 | -202 | -182 | -162 | -147 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -166 | -195 | -150 | -128 | -109 | -95 | -84 | -75 | -174 | -172 | -168 | -153 | -138 | -122 | -109 | 0 | -178 | -176 | -173 | -165 | -151 | 0 | 0 | 0 | |
| | | 80 | -240 | -280 | -217 | -184 | -157 | -136 | -121 | -108 | -252 | -249 | -243 | -222 | -199 | -175 | -157 | -142 | -258 | -255 | -250 | -240 | -218 | -200 | -182 | -165 |
| 130 | 44-X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -166 | -195 | -150 | -128 | -109 | -95 | -84 | -75 | -174 | -172 | -168 | -153 | -138 | -122 | -109 | 0 | -178 | -176 | -173 | -165 | -151 | 0 | 0 | 0 | |
| | | 80 | -240 | -280 | -217 | -184 | -157 | -136 | -121 | -108 | -252 | -249 | -243 | -222 | -199 | -175 | -157 | -142 | -258 | -255 | -250 | -240 | -218 | -200 | -182 | -165 |
| | | -70 | -70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -170 | -208 | -160 | -141 | -121 | -106 | -94 | -85 | -177 | -175 | -172 | -163 | -148 | -135 | 0 | 0 | -181 | -179 | -176 | -173 | 0 | 0 | 0 | 0 | |
| | | 80 | -246 | -283 | -232 | -203 | -174 | -152 | -136 | -122 | -257 | -253 | -249 | -236 | -214 | -194 | -174 | -158 | -262 | -259 | -255 | -251 | -233 | -215 | -200 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -173 | -212 | -167 | -150 | -133 | -117 | -105 | 0 | -180 | -178 | -175 | -172 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -251 | -283 | -241 | -217 | -191 | -168 | -150 | -136 | -261 | -258 | -253 | -249 | -228 | -210 | -191 | -174 | -265 | -262 | -259 | -255 | -245 | -228 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -176 | -212 | -170 | -159 | -144 | -128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -255 | -283 | -246 | -230 | -207 | -184 | -165 | -150 | -264 | -261 | -257 | -253 | -240 | -223 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -179 | -212 | -173 | -167 | -152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -259 | -283 | -251 | -241 | -220 | -198 | -179 | -163 | -266 | -264 | -260 | -257 | -251 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -181 | -212 | -176 | -173 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -262 | -283 | -254 | -250 | -231 | -212 | -193 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones



K2 Systems, LLC
 PV Tilt Up Kit Solar PV Mount System
 Standard size 43.2"x 80" Portrait Orientation

Table 3.8A Max Uplift Force (lbs) Singlespan only Exterior Conditions

| Exp D | Ultimate Wind Speed, V (mph) | Rail Type | Roof Wind Pressure Zone 1 | | | | | | | Roof Wind Pressure Zone 2 | | | | | | | Roof Wind Pressure Zone 3 | | | | | | | | | |
|-------|------------------------------|-----------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|---------------------------|------|------|------|------|------|------|------|------|-----|
| | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | Roof Snow Load (psf) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 90 | 44-X | -53 | -53 | -44 | -34 | 0 | 0 | 0 | 0 | -54 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -55 | -55 | -44 | -34 | 0 | 0 | 0 | 0 | -56 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -129 | -124 | -92 | -71 | -57 | -46 | -39 | -33 | -131 | -131 | -120 | -95 | -79 | -67 | -56 | -48 | -132 | -132 | -132 | -113 | -94 | -80 | -69 | -59 | |
| | | 80 | -180 | -179 | -133 | -103 | -82 | -67 | -56 | -48 | -182 | -182 | -172 | -138 | -115 | -96 | -81 | -70 | -183 | -183 | -183 | -163 | -136 | -117 | -100 | -86 |
| | | -54 | -54 | -52 | 0 | 0 | 0 | 0 | 0 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 48-X | -56 | -56 | -52 | 0 | 0 | 0 | 0 | 0 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -130 | -130 | -109 | -86 | -71 | -58 | -49 | -42 | -132 | -132 | -132 | -112 | -94 | -81 | -71 | -61 | -133 | -133 | -133 | -129 | -110 | -96 | -84 | -75 | |
| | | 80 | -181 | -181 | -157 | -124 | -103 | -85 | -71 | -61 | -184 | -184 | -184 | -163 | -136 | -118 | -103 | -88 | -185 | -185 | -185 | -160 | -139 | -122 | -108 | -98 |
| | | -54 | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -56 | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 48-XL | -131 | -131 | -125 | -100 | -83 | -72 | -61 | -52 | -133 | -133 | -133 | -133 | -129 | -109 | -95 | -84 | -75 | -133 | -133 | -133 | -133 | -127 | -111 | -98 | 0 |
| | | 80 | -183 | -183 | -180 | -145 | -121 | -104 | -88 | -76 | -185 | -185 | -185 | -185 | -158 | -137 | -121 | -108 | -185 | -185 | -185 | -182 | -160 | -142 | -128 | 0 |
| | | -54 | -54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -56 | -56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -132 | -132 | -132 | -114 | -96 | -83 | -73 | -63 | -133 | -133 | -133 | -133 | -123 | -108 | -96 | -86 | -74 | -134 | -134 | -134 | -134 | -125 | 0 | 0 | 0 |
| 120 | 48-XL | 80 | -184 | -184 | -184 | -165 | -139 | -120 | -106 | -92 | -185 | -185 | -185 | -185 | -158 | -137 | -121 | -108 | -185 | -185 | -185 | -182 | -160 | -142 | -128 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -133 | -133 | -133 | -127 | -108 | -94 | -83 | -75 | -134 | -134 | -134 | -134 | -134 | -121 | -108 | 0 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | |
| | | 80 | -185 | -185 | -185 | -184 | -157 | -136 | -121 | -108 | -186 | -186 | -186 | -186 | -157 | -142 | -126 | -106 | -186 | -186 | -186 | -186 | -186 | -182 | -165 | |
| 130 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -133 | -133 | -133 | -133 | -132 | -108 | -94 | -83 | -75 | -134 | -134 | -134 | -134 | -134 | -121 | -108 | 0 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | 0 |
| | | 80 | -185 | -185 | -185 | -184 | -157 | -136 | -121 | -108 | -186 | -186 | -186 | -186 | -157 | -142 | -126 | -106 | -186 | -186 | -186 | -186 | -186 | -182 | -165 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -133 | -133 | -133 | -133 | -132 | -116 | -105 | -94 | -84 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | |
| | | 80 | -185 | -185 | -185 | -185 | -174 | -152 | -136 | -122 | -186 | -186 | -186 | -186 | -158 | -142 | -127 | -107 | -187 | -187 | -187 | -187 | -187 | -187 | -187 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -133 | -133 | -133 | -133 | -132 | -116 | -104 | 0 | -134 | -134 | -134 | -134 | -134 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -186 | -186 | -186 | -186 | -186 | -186 | -186 | -186 | -186 | -186 | -186 | -186 | -186 | -174 | -142 | -127 | -107 | -187 | -187 | -187 | -187 | -187 | -187 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -134 | -134 | -134 | -134 | -134 | -127 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -186 | -186 | -186 | -186 | -186 | -184 | -165 | -150 | -187 | -187 | -187 | -187 | -187 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -134 | -134 | -134 | -134 | -134 | -127 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 80 | -186 | -186 | -186 | -186 | -186 | -179 | -163 | -187 | -187 | -187 | -187 | -187 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 48-XL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | -134 | -134 | -134 | -134 | -134 | -127 | -127 | -127 | -127 | -187 | -187 | -187 | -187 | -187 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 80 | -187 | -187 | -187 | -187 | -187 | -187 | -187 | -187 | -193 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: The Forces shown in the tables above account for reactions associated with the interior support of a multi-span condition. See Max length for Multi Span for corresponding span length.

See SEAOC PV-2 2012 for definition of Roof Zones

Larson Engineering Inc

1488 Bond Street, Suite 100 Naperville, IL 60563-6503 - p (630) 357-0540 - www.larsonengr.com