Zilla Corporation Premier Solar + NEX<sup>®</sup> Mounting Products

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# **Double Stud XL Span Tables**

72 Cell Modules 16" Rafter Spacing 7/16" OSB

### **Roof Pitch 0-7 Degree**

Interior Wind Zone 1, page 2 Edge Wind Zone 2, page 3 Edge Wind Zone 3, page 4

## **Roof Pitch 7-27 Degree**

Interior Wind Zone 1, page 5 Edge Wind Zone 2, page 6 Edge Wind Zone 3, page 7

## **Roof Pitch 27-45 Degree**

Interior Wind Zone 1, page 8 Edge Wind Zone 2, page 9 Edge Wind Zone 3, page 10





#### Table 182: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	Roof Pitch ≤ 7°							
Interior Wind Zone 1								
Exposure	Basic Wind Speed	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load		
20-	85 mph	standard	standard	standard	standard	custom		
B	90 mph	standard	standard	standard	standard	custom		
(urban/ suburban)	100 mph	standard	standard	standard	standard	custom		
suburban)	110 mph	standard	standard	standard	standard	custom		
	120 mph	standard	standard	standard	standard	custom		
	85 mph	standard	standard	standard	standard	custom		
С	90 mph	standard	standard	standard	standard	custom		
(rural)	100 mph	standard	standard	standard	standard	custom		
and the second	110 mph	standard	standard	standard	standard	custom		
Sind Asian	120 mph	standard	standard	standard	standard	custom		
D	85 mph	standard	standard	standard	standard	custom		
(flat,	90 mph	standard	standard	standard	standard	custom		
unobstructed	100 mph	standard	standard	standard	standard	custom		
areas / shorelines)	110 mph	standard	standard	standard	standard	custom		
shorelines)	120 mph	standard	standard	standard	standard	custom		

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable roofs with roof slope less than or equal to 7 degrees.

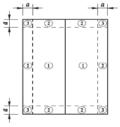
c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- f. Photovoltaic modules are parallel with the roof slope.
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - ii. Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.

iii. Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice

- i. ASCE 7-10 Wind Load Parameters:
  - i. Risk Category II
  - ii. Topographic Factor ( $K_{x}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
  - iii. Directionality Factor ( $K_d$ ) = 0.85
- j. The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.

Wind Zones for Gable Roofs with  $\vartheta \leq 7^{\circ}$ :





#### Table 183: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	Roof Pitch ≤ 7°								
	Edge Wind Zone 2								
Exposure	<b>Basic Wind Speed</b>	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load			
and the second second	85 mph	standard	standard	standard	standard	custom			
B	90 mph	standard	standard	standard	standard	custom			
(urban/	100 mph	standard	standard	standard	standard	custom			
suburban)	110 mph	standard	standard	standard	standard	custom			
	120 mph	standard	standard	standard	standard	custom			
	85 mph	standard	standard	standard	standard	custom			
C	90 mph	standard	standard	standard	standard	custom			
(rural)	100 mph	standard	standard	standard	standard	custom			
	110 mph	standard	standard	standard	standard	custom			
and the set	120 mph	custom	custom	custom	custom	custom			
D	85 mph	standard	standard	standard	standard	custom			
(flat,	90 mph	standard	standard	standard	standard	custom			
unobstructed	100 mph	standard	standard	standard	standard	custom			
areas /	110 mph	custom	custom	custom	custom	custom			
shorelines)	120 mph	custom	custom	custom	custom	custom			

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable roofs with roof slope less than or equal to 7 degrees.

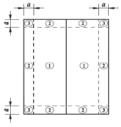
c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- f. Photovoltaic modules are parallel with the roof slope.
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - ii. Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.

iii. Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice

- i. ASCE 7-10 Wind Load Parameters:
  - i. Risk Category II
  - ii. Topographic Factor ( $K_{x}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
  - iii. Directionality Factor ( $K_d$ ) = 0.85
- j. The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.

Wind Zones for Gable Roofs with  $\vartheta \leq 7^{\circ}$ :





#### Table 184: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	Roof Pitch ≤ 7°								
Edge Wind Zone 3									
Exposure	Basic Wind Speed	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load			
20	85 mph	standard	standard	standard	standard	custom			
В	90 mph	standard	standard	standard	standard	custom			
(urban/	100 mph	standard	standard	standard	standard	custom			
suburban)	110 mph	standard	standard	standard	standard	custom			
	120 mph	custom	custom	custom	custom	custom			
	85 mph	standard	standard	standard	standard	custom			
с	90 mph	standard	standard	standard	standard	custom			
(rural)	100 mph	custom	custom	custom	custom	custom			
and the second	110 mph	custom	custom	custom	custom	custom			
STATE STATE	120 mph	custom	custom	custom	custom	custom			
D	85 mph	standard	standard	standard	standard	custom			
(flat,	90 mph	custom	custom	custom	custom	custom			
unobstructed	100 mph	custom	custom	custom	custom	custom			
areas /	110 mph	custom	custom	custom	custom	custom			
shorelines)	120 mph	custom	custom	custom	custom	custom			

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable roofs with roof slope less than or equal to 7 degrees.

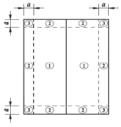
c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- f. Photovoltaic modules are parallel with the roof slope.
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - ii. Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.

iii. Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice

- i. ASCE 7-10 Wind Load Parameters:
  - i. Risk Category II
  - ii. Topographic Factor ( $K_{xi}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
  - iii. Directionality Factor ( $K_d$ ) = 0.85
- j. The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.

Wind Zones for Gable Roofs with  $\vartheta \leq 7^{\circ}$ :





#### Table 185: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	7° < Roof Pitch ≤ 27°							
Interior Wind Zone 1								
Exposure	Basic Wind Speed	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load		
10-	85 mph	standard	standard	standard	standard	custom		
В	90 mph	standard	standard	standard	standard	custom		
(urban/	100 mph	standard	standard	standard	standard	custom		
suburban)	110 mph	standard	standard	standard	standard	custom		
	120 mph	standard	standard	standard	standard	custom		
	85 mph	standard	standard	standard	standard	custom		
С	90 mph	standard	standard	standard	standard	custom		
(rural)	100 mph	standard	standard	standard	standard	custom		
and the second	110 mph	standard	standard	standard	standard	custom		
Dig Asia	120 mph	standard	standard	standard	standard	custom		
D	85 mph	standard	standard	standard	standard	custom		
(flat,	90 mph	standard	standard	standard	standard	custom		
unobstructed	100 mph	standard	standard	standard	standard	custom		
areas /	110 mph	standard	standard	standard	standard	custom		
shorelines)	120 mph	standard	standard	standard	standard	custom		

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable/hip roofs with roof slope greater than 7 degrees and less than or equal to 27 degrees.

c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.

e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.

- *f. Photovoltaic modules are parallel with the roof slope.*
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - *ii.* Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.
  - iii. Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice.
- i. ASCE 7-10 Wind Load Parameters:

j.

- i. Risk Category II
- ii. Topographic Factor ( $K_{xt}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
- iii. Directionality Factor  $(K_d) = 0.85$
- The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.
- I. Edge Wind Zone 3 shall be treated as Zone 2 for  $\vartheta \le 25^{\circ}$ .

Wind Zones for Gable/Hip Roofs with 7° <  $\vartheta \le 27^{\circ}$ :

For installations that do not conform to the assumptions listed above contact Zilla for a more complete engineering analysis.



#### Table 186: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	7° < Roof Pitch ≤ 27°								
Edge Wind Zone 2									
Exposure	<b>Basic Wind Speed</b>	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load			
20 -	85 mph	standard	standard	standard	standard	custom			
В	90 mph	standard	standard	standard	standard	custom			
(urban/	100 mph	standard	standard	standard	standard	custom			
suburban)	110 mph	standard	standard	standard	standard	custom			
	120 mph	standard	standard	standard	standard	custom			
	85 mph	standard	standard	standard	standard	custom			
С	90 mph	standard	standard	standard	standard	custom			
(rural)	100 mph	standard	standard	standard	standard	custom			
and the state	110 mph	standard	standard	standard	standard	custom			
	120 mph	custom	custom	custom	custom	custom			
D	85 mph	standard	standard	standard	standard	custom			
(flat,	90 mph	standard	standard	standard	standard	custom			
unobstructed	100 mph	standard	standard	standard	standard	custom			
areas /	110 mph	custom	custom	custom	custom	custom			
shorelines)	120 mph	custom	custom	custom	custom	custom			

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable/hip roofs with roof slope greater than 7 degrees and less than or equal to 27 degrees.

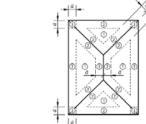
c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- *f. Photovoltaic modules are parallel with the roof slope.*
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - *ii.* Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.
  - *iii.* Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice.
- i. ASCE 7-10 Wind Load Parameters:

j.

- i. Risk Category II
- ii. Topographic Factor ( $K_{xt}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
- iii. Directionality Factor  $(K_d) = 0.85$
- The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.
- I. Edge Wind Zone 3 shall be treated as Zone 2 for  $\vartheta \le 25^{\circ}$ .

Wind Zones for Gable/Hip Roofs with 7° <  $\vartheta \le 27$ °:



For installations that do not conform to the assumptions listed above contact Zilla for a more complete engineering analysis.



#### Table 187: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	7° < Roof Pitch ≤ 27°							
Edge Wind Zone 3								
Exposure	<b>Basic Wind Speed</b>	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load		
20 -	85 mph	standard	standard	standard	standard	custom		
B	90 mph	standard	standard	standard	standard	custom		
(urban/	100 mph	standard	standard	standard	standard	custom		
suburban)	110 mph	standard	standard	standard	standard	custom		
	120 mph	custom	custom	custom	custom	custom		
	85 mph	standard	standard	standard	standard	custom		
С	90 mph	standard	standard	standard	standard	custom		
(rural)	100 mph	custom	custom	custom	custom	custom		
	110 mph	custom	custom	custom	custom	custom		
The second second	120 mph	custom	custom	custom	custom	custom		
D	85 mph	standard	standard	standard	standard	custom		
(flat,	90 mph	custom	custom	custom	custom	custom		
unobstructed	100 mph	custom	custom	custom	custom	custom		
areas /	110 mph	custom	custom	custom	custom	custom		
shorelines)	120 mph	custom	custom	custom	custom	custom		

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable/hip roofs with roof slope greater than 7 degrees and less than or equal to 27 degrees.

c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- *f. Photovoltaic modules are parallel with the roof slope.*
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - *ii.* Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.
  - *iii.* Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice.
- i. ASCE 7-10 Wind Load Parameters:

j.

- i. Risk Category II
- ii. Topographic Factor ( $K_{x}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
- iii. Directionality Factor  $(K_d) = 0.85$
- The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.
- I. Edge Wind Zone 3 shall be treated as Zone 2 for  $\vartheta \le 25^{\circ}$ .

Wind Zones for Gable/Hip Roofs with 7° <  $\vartheta \le 27^\circ$ :



#### Table 188: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	27° < Roof Pitch ≤ 45°							
Interior Wind Zone 1								
Exposure	<b>Basic Wind Speed</b>	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load		
20 -	85 mph	standard	standard	standard	standard	standard		
B	90 mph	standard	standard	standard	standard	standard		
(urban/	100 mph	standard	standard	standard	standard	standard		
suburban)	110 mph	standard	standard	standard	standard	standard		
	120 mph	standard	standard	standard	standard	standard		
	85 mph	standard	standard	standard	standard	standard		
С	90 mph	standard	standard	standard	standard	standard		
(rural)	100 mph	standard	standard	standard	standard	standard		
	110 mph	standard	standard	standard	standard	custom		
THE A STREET	120 mph	standard	standard	standard	standard	custom		
D	85 mph	standard	standard	standard	standard	standard		
(flat,	90 mph	standard	standard	standard	standard	standard		
unobstructed	100 mph	standard	standard	standard	standard	custom		
areas /	110 mph	standard	standard	standard	standard	custom		
shorelines)	120 mph	standard	standard	standard	standard	custom		

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable roofs with roof slope greater than 27 degrees and less than or equal to 45 degrees.

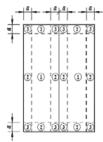
c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- *f.* Photovoltaic modules are parallel with the roof slope.
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - *ii.* Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.
  - iii. Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice.
- i. ASCE 7-10 Wind Load Parameters:

j.

- i. Risk Category II
- ii. Topographic Factor ( $K_{xt}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
- iii. Directionality Factor ( $K_d$ ) = 0.85
- The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.

Wind Zones for Gable Roofs with  $27^{\circ} < \vartheta \le 45^{\circ}$ :





#### Table 189: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	27° < Roof Pitch ≤ 45°								
Edge Wind Zone 2									
Exposure	Basic Wind Speed	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load			
20	85 mph	standard	standard	standard	standard	standard			
В	90 mph	standard	standard	standard	standard	standard			
(urban/	100 mph	standard	standard	standard	standard	standard			
suburban)	110 mph	standard	standard	standard	standard	standard			
	120 mph	standard	standard	standard	standard	standard			
	85 mph	standard	standard	standard	standard	standard			
С	90 mph	standard	standard	standard	standard	standard			
(rural)	100 mph	standard	standard	standard	standard	standard			
	110 mph	standard	standard	standard	standard	custom			
and Aster	120 mph	standard	standard	standard	standard	custom			
D	85 mph	standard	standard	standard	standard	standard			
(flat,	90 mph	standard	standard	standard	standard	standard			
unobstructed	100 mph	standard	standard	standard	standard	custom			
areas /	110 mph	standard	standard	standard	standard	custom			
shorelines)	120 mph	standard	standard	standard	standard	custom			

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable roofs with roof slope greater than 27 degrees and less than or equal to 45 degrees.

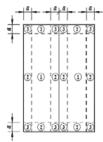
c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- *f.* Photovoltaic modules are parallel with the roof slope.
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - i. Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - *ii.* Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.
  - iii. Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice.
- *i.* ASCE 7-10 Wind Load Parameters:

j.

- i. Risk Category II
- ii. Topographic Factor ( $K_{xt}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
- iii. Directionality Factor ( $K_d$ ) = 0.85
- The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.

Wind Zones for Gable Roofs with  $27^{\circ} < \vartheta \le 45^{\circ}$ :





#### Table 190: Zilla<sup>®</sup> Double Stud XL – 16" Rafter Spacing, 7/16" OSB, 48" Continuous Rail Spans Maximum Module Size 79" x 41"- Typical 72 Cell Module

	27° < Roof Pitch ≤ 45°								
	Edge Wind Zone 3								
Exposure	Basic Wind Speed	0 psf Snow Load	10 psf Snow Load	20 psf Snow Load	30 psf Snow Load	40 psf Snow Load			
the second second	85 mph	standard	standard	standard	standard	standard			
B	90 mph	standard	standard	standard	standard	standard			
(urban/	100 mph	standard	standard	standard	standard	standard			
suburban)	110 mph	standard	standard	standard	standard	standard			
	120 mph	standard	standard	standard	standard	standard			
	85 mph	standard	standard	standard	standard	standard			
С	90 mph	standard	standard	standard	standard	standard			
(rural)	100 mph	standard	standard	standard	standard	standard			
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	110 mph	standard	standard	standard	standard	custom			
and the second	120 mph	standard	standard	standard	standard	custom			
D	85 mph	standard	standard	standard	standard	standard			
(flat,	90 mph	standard	standard	standard	standard	standard			
unobstructed	100 mph	standard	standard	standard	standard	custom			
areas /	110 mph	standard	standard	standard	standard	custom			
shorelines)	120 mph	standard	standard	standard	standard	custom			

Tabulated values are based upon the following:

a. Building height is less than or equal to 30 feet.

b. Residential gable roofs with roof slope greater than 27 degrees and less than or equal to 45 degrees.

c. Maximum photovoltaic module size is 79 inches long by 41 inches wide.

- d. Standard Zilla Double Stud XL spaced at 48" OC assumes photovoltaic modules supported by two continuous rails spanning a maximum of 48" parallel to the short side of the module.
- e. Standard Zilla Double Stud XL design pertains only to the Double Stud XL connection. Design of rails attached to the Double Stud XL and existing structure are outside the scope of this design.
- *f.* Photovoltaic modules are parallel with the roof slope.
- g. Loads per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
- h. ASCE 7-10 Wind Exposure Categories:
  - *i.* Exposure B = Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
  - *ii.* Exposure C = Open terrain with scattered obstructions having heights generally less than 30 ft. Includes flat open country and grasslands.
  - iii. Exposure D = Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats, and unbroken ice.
- i. ASCE 7-10 Wind Load Parameters:

j.

- i. Risk Category II
- ii. Topographic Factor ( $K_{xt}$ ) = 1.0 [\*Note: This value has been set to 1.0 under the assumption that the system is NOT located on the upper half of a hill or ridge or near the crest of an escarpment.]
- iii. Directionality Factor ( $K_d$ ) = 0.85
- The snow load indicated in the tables is the snow load applied to the modules.
- k. Edge Wind Zone is defined by ASCE 7-10 as **a** with **a** being equal to: 10 percent of least horizontal dimension or 0.4h (h = height of building), whichever is smaller, but not less than either 4 percent of least horizontal dimension or 3 feet.

Wind Zones for Gable Roofs with  $27^{\circ} < \vartheta \le 45^{\circ}$ :

