



February 26, 2020

EcoFasten

4741 West Polk Street, Suite 4

Phoenix, AZ 85043

TEL: (877) 859-3947

Attn.: Engineering Department,

Re: Engineering Certification for the EcoFasten Rock-it System Installation Manual

This letter is to document that PZSE, Inc.-Structural Engineers has reviewed EcoFasten Rock-it System Installation Manual published October 12, 2015 for installation and the following "Loading Tables" for ASCE7-16 attachment spacing.

SCOPE OF THE SYSTEM:

The EcoFasten Rock-it System is a solar panel support system for installing solar photovoltaic arrays on sloped roofs of buildings. Typically such buildings are residential with shingle or tile roofs. The number and spacing of attachments to the roof structure can vary depending on various site specific criteria including, but not limited to, roof slope, spacing of supporting structural members and environmental loading.

SCOPE OF OUR REVIEW:

PZSE, Inc.-Structural Engineers provided a review of the following

- Rock-it System design methodology
- Rock-it System Installation Manual
- Rock-it System Loading Tables

and has determined that all information, data and analysis contained within the Installation Manual are based on, and are in compliance with, the structural requirements of the following Reference Documents:

- Minimum Design Loads for Buildings and other Structures, ASCE/SEI 7-05, 7-10, 7-16
- International Building Code, 2018/2015/2012/2009 Edition, by International Code Council, Inc.
- Aluminum Design Manual, 2010 & 2015 Editions, by The Aluminum Association

This letter certifies that the EcoFasten Rock-it System Installation Manual and Loading Tables are in compliance with the above Reference Documents.



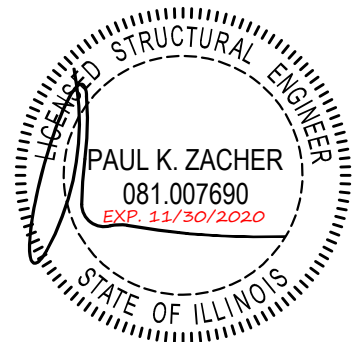
DESIGN RESPONSIBILITY:

The Rock-it System Installation Manual is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, the user of the Installation Manual has sole responsibility for the accuracy of the design and integrity of the system.

The Installation Manual does not check the capacity of the building structure to support the loads imposed on the building by the array, such as bending strength of roof rafters spanning between supports. This requires additional knowledge of the building and is outside the scope of the Installation Manual and our review.

If you have any questions on the above, do not hesitate to call.

Prepared By:
PZSE, Inc. - Structural Engineers
Roseville, CA



Roof Snow Load 0-20 psf

Modules in Landscape on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	64 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	D	54 in	72 in	69 in	72 in	72 in	72 in	70 in	72 in	72 in
115 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	59 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	D	50 in	72 in	63 in	66 in	72 in	72 in	64 in	72 in	72 in
125 mph	B	70 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	50 in	72 in	63 in	66 in	72 in	72 in	64 in	72 in	72 in
	D	42 in	64 in	53 in	56 in	72 in	70 in	54 in	72 in	72 in
140 mph	B	56 in	72 in	70 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	40 in	61 in	50 in	53 in	72 in	66 in	51 in	72 in	70 in
	D	34 in	51 in	42 in	45 in	60 in	56 in	43 in	72 in	59 in
150 mph	B	48 in	72 in	61 in	65 in	72 in	72 in	63 in	72 in	72 in
	C	35 in	53 in	44 in	46 in	62 in	58 in	45 in	72 in	61 in
	D	29 in	45 in	37 in	39 in	53 in	49 in	38 in	64 in	51 in
165 mph	B	40 in	61 in	51 in	53 in	72 in	67 in	52 in	72 in	71 in
	C	29 in	44 in	36 in	38 in	51 in	48 in	37 in	63 in	50 in
	D	24 in	37 in	31 in	32 in	44 in	40 in	31 in	53 in	43 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 72"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module width of 40"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 21-30 psf

Modules in Landscape on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	64 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	D	54 in	72 in	69 in	72 in	72 in	72 in	58 in	58 in	58 in
115 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	59 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	D	50 in	72 in	63 in	66 in	72 in	72 in	58 in	58 in	58 in
125 mph	B	70 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	50 in	72 in	63 in	66 in	72 in	72 in	58 in	58 in	58 in
	D	42 in	64 in	53 in	56 in	72 in	70 in	54 in	58 in	58 in
140 mph	B	56 in	72 in	70 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	40 in	61 in	50 in	53 in	72 in	66 in	51 in	58 in	58 in
	D	34 in	51 in	42 in	45 in	60 in	56 in	43 in	58 in	58 in
150 mph	B	48 in	72 in	61 in	65 in	72 in	72 in	58 in	58 in	58 in
	C	35 in	53 in	44 in	46 in	62 in	58 in	45 in	58 in	58 in
	D	29 in	45 in	37 in	39 in	53 in	49 in	38 in	58 in	51 in
165 mph	B	40 in	61 in	51 in	53 in	72 in	67 in	52 in	58 in	58 in
	C	29 in	44 in	36 in	38 in	51 in	48 in	37 in	58 in	50 in
	D	24 in	37 in	31 in	32 in	44 in	40 in	31 in	53 in	43 in

Notes:

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- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 31-40 psf

Modules in Landscape on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	72 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	64 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	D	54 in	72 in	69 in	70 in	70 in	70 in	45 in	45 in	45 in
115 mph	B	72 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	59 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	D	50 in	72 in	63 in	66 in	70 in	70 in	45 in	45 in	45 in
125 mph	B	70 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	50 in	72 in	63 in	66 in	70 in	70 in	45 in	45 in	45 in
	D	42 in	64 in	53 in	56 in	70 in	70 in	45 in	45 in	45 in
140 mph	B	56 in	72 in	70 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	40 in	61 in	50 in	53 in	70 in	66 in	45 in	45 in	45 in
	D	34 in	51 in	42 in	45 in	60 in	56 in	43 in	45 in	45 in
150 mph	B	48 in	72 in	61 in	65 in	70 in	70 in	45 in	45 in	45 in
	C	35 in	53 in	44 in	46 in	62 in	58 in	45 in	45 in	45 in
	D	29 in	45 in	37 in	39 in	53 in	49 in	38 in	45 in	45 in
165 mph	B	40 in	61 in	51 in	53 in	70 in	67 in	45 in	45 in	45 in
	C	29 in	44 in	36 in	38 in	51 in	48 in	37 in	45 in	45 in
	D	24 in	37 in	31 in	32 in	44 in	40 in	31 in	45 in	43 in

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- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 41-50 psf

Modules in Landscape on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	72 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	64 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	D	54 in	72 in	69 in	57 in	57 in	57 in	37 in	37 in	37 in
115 mph	B	72 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	59 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	D	50 in	72 in	63 in	57 in	57 in	57 in	37 in	37 in	37 in
125 mph	B	70 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	50 in	72 in	63 in	57 in	57 in	57 in	37 in	37 in	37 in
	D	42 in	64 in	53 in	56 in	57 in	57 in	37 in	37 in	37 in
140 mph	B	56 in	72 in	70 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	40 in	61 in	50 in	53 in	57 in	57 in	37 in	37 in	37 in
	D	34 in	51 in	42 in	45 in	57 in	56 in	37 in	37 in	37 in
150 mph	B	48 in	72 in	61 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	35 in	53 in	44 in	46 in	57 in	57 in	37 in	37 in	37 in
	D	29 in	45 in	37 in	39 in	53 in	49 in	37 in	37 in	37 in
165 mph	B	40 in	61 in	51 in	53 in	57 in	57 in	37 in	37 in	37 in
	C	29 in	44 in	36 in	38 in	51 in	48 in	37 in	37 in	37 in
	D	24 in	37 in	31 in	32 in	44 in	40 in	31 in	37 in	37 in

Notes:

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- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 51-60 psf

Modules in Landscape on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	54 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
115 mph	B	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	59 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	50 in	64 in	63 in	48 in	48 in	48 in	31 in	31 in	31 in
125 mph	B	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	50 in	64 in	63 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	42 in	64 in	53 in	48 in	48 in	48 in	31 in	31 in	31 in
140 mph	B	56 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	40 in	61 in	50 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	34 in	51 in	42 in	45 in	48 in	48 in	31 in	31 in	31 in
150 mph	B	48 in	64 in	61 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	35 in	53 in	44 in	46 in	48 in	48 in	31 in	31 in	31 in
	D	29 in	45 in	37 in	39 in	48 in	48 in	31 in	31 in	31 in
165 mph	B	40 in	61 in	51 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	29 in	44 in	36 in	38 in	48 in	48 in	31 in	31 in	31 in
	D	24 in	37 in	31 in	32 in	44 in	40 in	31 in	31 in	31 in

Notes:

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Roof Snow Load 0-20 psf

Modules in Portrait on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	C	38 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	D	32 in	48 in	41 in	43 in	48 in	48 in	42 in	48 in	48 in
115 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	C	35 in	48 in	44 in	46 in	48 in	48 in	45 in	48 in	48 in
	D	29 in	45 in	37 in	39 in	48 in	48 in	38 in	48 in	48 in
125 mph	B	41 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	C	29 in	45 in	37 in	39 in	48 in	48 in	38 in	48 in	48 in
	D	25 in	38 in	31 in	33 in	45 in	42 in	32 in	48 in	44 in
140 mph	B	33 in	48 in	42 in	44 in	48 in	48 in	42 in	48 in	48 in
	C	23 in	36 in	30 in	31 in	42 in	39 in	30 in	48 in	41 in
	D	20 in	30 in	25 in	26 in	36 in	33 in	26 in	43 in	35 in
150 mph	B	29 in	44 in	36 in	38 in	48 in	48 in	37 in	48 in	48 in
	C	20 in	31 in	26 in	27 in	37 in	34 in	26 in	45 in	36 in
	D	17 in	26 in	22 in	23 in	31 in	29 in	22 in	38 in	30 in
165 mph	B	24 in	36 in	30 in	32 in	43 in	40 in	31 in	48 in	42 in
	C	17 in	26 in	21 in	23 in	30 in	28 in	22 in	37 in	30 in
	D	14 in	22 in	18 in	19 in	26 in	24 in	18 in	31 in	25 in

Notes:

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Roof Snow Load 21-30 psf

Modules in Portrait on Gable Roof's										
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		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	C	38 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	D	32 in	48 in	41 in	43 in	48 in	48 in	35 in	35 in	35 in
115 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	C	35 in	48 in	44 in	46 in	48 in	48 in	35 in	35 in	35 in
	D	29 in	45 in	37 in	39 in	48 in	48 in	35 in	35 in	35 in
125 mph	B	41 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	C	29 in	45 in	37 in	39 in	48 in	48 in	35 in	35 in	35 in
	D	25 in	38 in	31 in	33 in	45 in	42 in	32 in	35 in	35 in
140 mph	B	33 in	48 in	42 in	44 in	48 in	48 in	35 in	35 in	35 in
	C	23 in	36 in	30 in	31 in	42 in	39 in	30 in	35 in	35 in
	D	20 in	30 in	25 in	26 in	36 in	33 in	26 in	35 in	35 in
150 mph	B	29 in	44 in	36 in	38 in	48 in	48 in	35 in	35 in	35 in
	C	20 in	31 in	26 in	27 in	37 in	34 in	26 in	35 in	35 in
	D	17 in	26 in	22 in	23 in	31 in	29 in	22 in	35 in	30 in
165 mph	B	24 in	36 in	30 in	32 in	43 in	40 in	31 in	35 in	35 in
	C	17 in	26 in	21 in	23 in	30 in	28 in	22 in	35 in	30 in
	D	14 in	22 in	18 in	19 in	26 in	24 in	18 in	31 in	25 in

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Roof Snow Load 31-40 psf

Modules in Portrait on Gable Roof's										
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		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	48 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	38 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	D	32 in	48 in	41 in	43 in	43 in	43 in	27 in	27 in	27 in
115 mph	B	48 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	35 in	48 in	44 in	43 in	43 in	43 in	27 in	27 in	27 in
	D	29 in	45 in	37 in	39 in	43 in	43 in	27 in	27 in	27 in
125 mph	B	41 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	29 in	45 in	37 in	39 in	43 in	43 in	27 in	27 in	27 in
	D	25 in	38 in	31 in	33 in	43 in	42 in	27 in	27 in	27 in
140 mph	B	33 in	48 in	42 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	23 in	36 in	30 in	31 in	42 in	39 in	27 in	27 in	27 in
	D	20 in	30 in	25 in	26 in	36 in	33 in	26 in	27 in	27 in
150 mph	B	29 in	44 in	36 in	38 in	43 in	43 in	27 in	27 in	27 in
	C	20 in	31 in	26 in	27 in	37 in	34 in	26 in	27 in	27 in
	D	17 in	26 in	22 in	23 in	31 in	29 in	22 in	27 in	27 in
165 mph	B	24 in	36 in	30 in	32 in	43 in	40 in	27 in	27 in	27 in
	C	17 in	26 in	21 in	23 in	30 in	28 in	22 in	27 in	27 in
	D	14 in	22 in	18 in	19 in	26 in	24 in	18 in	27 in	25 in

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Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 66"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 41-50 psf

Modules in Portrait on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	46 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	38 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	D	32 in	46 in	41 in	35 in	35 in	35 in	22 in	22 in	22 in
115 mph	B	46 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	35 in	46 in	44 in	35 in	35 in	35 in	22 in	22 in	22 in
	D	29 in	45 in	37 in	35 in	35 in	35 in	22 in	22 in	22 in
125 mph	B	41 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	29 in	45 in	37 in	35 in	35 in	35 in	22 in	22 in	22 in
	D	25 in	38 in	31 in	33 in	35 in	35 in	22 in	22 in	22 in
140 mph	B	33 in	46 in	42 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	23 in	36 in	30 in	31 in	35 in	35 in	22 in	22 in	22 in
	D	20 in	30 in	25 in	26 in	35 in	33 in	22 in	22 in	22 in
150 mph	B	29 in	44 in	36 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	20 in	31 in	26 in	27 in	35 in	34 in	22 in	22 in	22 in
	D	17 in	26 in	22 in	23 in	31 in	29 in	22 in	22 in	22 in
165 mph	B	24 in	36 in	30 in	32 in	35 in	35 in	22 in	22 in	22 in
	C	17 in	26 in	21 in	23 in	30 in	28 in	22 in	22 in	22 in
	D	14 in	22 in	18 in	19 in	26 in	24 in	18 in	22 in	22 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 66"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 51-60 psf

Modules in Portrait on Gable Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1, 2e	2n, 2r, 3e	3r	1, 2e	2n, 2r, 3e	3r	1, 2e, 2r	2n, 3e	3e
110 mph	B	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	38 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	32 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
115 mph	B	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	35 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	29 in	39 in	37 in	29 in	29 in	29 in	19 in	19 in	19 in
125 mph	B	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	29 in	39 in	37 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	25 in	38 in	31 in	29 in	29 in	29 in	19 in	19 in	19 in
140 mph	B	33 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	23 in	36 in	30 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	20 in	30 in	25 in	26 in	29 in	29 in	19 in	19 in	19 in
150 mph	B	29 in	39 in	36 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	20 in	31 in	26 in	27 in	29 in	29 in	19 in	19 in	19 in
	D	17 in	26 in	22 in	23 in	29 in	29 in	19 in	19 in	19 in
165 mph	B	24 in	36 in	30 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	17 in	26 in	21 in	23 in	29 in	28 in	19 in	19 in	19 in
	D	14 in	22 in	18 in	19 in	26 in	24 in	18 in	19 in	19 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 66"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 0-20 psf

Modules in Landscape on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	D	60 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
115 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	65 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	D	55 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
125 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	55 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	D	47 in	72 in	71 in	67 in	72 in	72 in	62 in	72 in	72 in
140 mph	B	62 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	44 in	72 in	67 in	64 in	72 in	72 in	59 in	72 in	72 in
	D	37 in	61 in	57 in	54 in	72 in	72 in	50 in	66 in	67 in
150 mph	B	54 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in	72 in
	C	38 in	63 in	58 in	55 in	72 in	72 in	51 in	69 in	70 in
	D	32 in	53 in	49 in	47 in	65 in	65 in	43 in	58 in	59 in
165 mph	B	44 in	72 in	68 in	64 in	72 in	72 in	59 in	72 in	72 in
	C	32 in	52 in	48 in	46 in	64 in	64 in	42 in	57 in	57 in
	D	27 in	44 in	41 in	39 in	54 in	54 in	36 in	48 in	49 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 72"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module width of 40"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 21-30 psf

Modules in Landscape on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	72 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	D	60 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
115 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	65 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	D	55 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
125 mph	B	72 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	55 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	D	47 in	72 in	71 in	67 in	72 in	72 in	58 in	58 in	58 in
140 mph	B	62 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	44 in	72 in	67 in	64 in	72 in	72 in	58 in	58 in	58 in
	D	37 in	61 in	57 in	54 in	72 in	72 in	50 in	58 in	58 in
150 mph	B	54 in	72 in	72 in	72 in	72 in	72 in	58 in	58 in	58 in
	C	38 in	63 in	58 in	55 in	72 in	72 in	51 in	58 in	58 in
	D	32 in	53 in	49 in	47 in	65 in	65 in	43 in	58 in	58 in
165 mph	B	44 in	72 in	68 in	64 in	72 in	72 in	58 in	58 in	58 in
	C	32 in	52 in	48 in	46 in	64 in	64 in	42 in	57 in	57 in
	D	27 in	44 in	41 in	39 in	54 in	54 in	36 in	48 in	49 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 72"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module width of 40"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 31-40 psf

Modules in Landscape on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	72 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	72 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	D	60 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
115 mph	B	72 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	65 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	D	55 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
125 mph	B	72 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	55 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	D	47 in	72 in	71 in	67 in	70 in	70 in	45 in	45 in	45 in
140 mph	B	62 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	44 in	72 in	67 in	64 in	70 in	70 in	45 in	45 in	45 in
	D	37 in	61 in	57 in	54 in	70 in	70 in	45 in	45 in	45 in
150 mph	B	54 in	72 in	72 in	70 in	70 in	70 in	45 in	45 in	45 in
	C	38 in	63 in	58 in	55 in	70 in	70 in	45 in	45 in	45 in
	D	32 in	53 in	49 in	47 in	65 in	65 in	43 in	45 in	45 in
165 mph	B	44 in	72 in	68 in	64 in	70 in	70 in	45 in	45 in	45 in
	C	32 in	52 in	48 in	46 in	64 in	64 in	42 in	45 in	45 in
	D	27 in	44 in	41 in	39 in	54 in	54 in	36 in	45 in	45 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 72"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module width of 40"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 41-50 psf

Modules in Landscape on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	72 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	72 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	D	60 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
115 mph	B	72 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	65 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	D	55 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
125 mph	B	72 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	55 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	D	47 in	72 in	71 in	57 in	57 in	57 in	37 in	37 in	37 in
140 mph	B	62 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	44 in	72 in	67 in	57 in	57 in	57 in	37 in	37 in	37 in
	D	37 in	61 in	57 in	54 in	57 in	57 in	37 in	37 in	37 in
150 mph	B	54 in	72 in	72 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	38 in	63 in	58 in	55 in	57 in	57 in	37 in	37 in	37 in
	D	32 in	53 in	49 in	47 in	57 in	57 in	37 in	37 in	37 in
165 mph	B	44 in	72 in	68 in	57 in	57 in	57 in	37 in	37 in	37 in
	C	32 in	52 in	48 in	46 in	57 in	57 in	37 in	37 in	37 in
	D	27 in	44 in	41 in	39 in	54 in	54 in	36 in	37 in	37 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 72"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module width of 40"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 51-60 psf

Modules in Landscape on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	60 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
115 mph	B	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	55 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
125 mph	B	64 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	55 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	47 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
140 mph	B	62 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	44 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	37 in	61 in	57 in	48 in	48 in	48 in	31 in	31 in	31 in
150 mph	B	54 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	38 in	63 in	58 in	48 in	48 in	48 in	31 in	31 in	31 in
	D	32 in	53 in	49 in	47 in	48 in	48 in	31 in	31 in	31 in
165 mph	B	44 in	64 in	64 in	48 in	48 in	48 in	31 in	31 in	31 in
	C	32 in	52 in	48 in	46 in	48 in	48 in	31 in	31 in	31 in
	D	27 in	44 in	41 in	39 in	48 in	48 in	31 in	31 in	31 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 72"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module width of 40"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 0-20 psf

Modules in Portrait on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	C	42 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	D	36 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
115 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	C	39 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	D	33 in	48 in	48 in	47 in	48 in	48 in	44 in	48 in	48 in
125 mph	B	46 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	C	33 in	48 in	48 in	47 in	48 in	48 in	44 in	48 in	48 in
	D	28 in	45 in	42 in	40 in	48 in	48 in	37 in	48 in	48 in
140 mph	B	37 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in	48 in
	C	26 in	43 in	40 in	38 in	48 in	48 in	35 in	46 in	47 in
	D	22 in	36 in	33 in	32 in	44 in	44 in	29 in	39 in	40 in
150 mph	B	32 in	48 in	48 in	46 in	48 in	48 in	42 in	48 in	48 in
	C	23 in	37 in	34 in	33 in	45 in	45 in	30 in	40 in	41 in
	D	19 in	31 in	29 in	28 in	38 in	38 in	26 in	34 in	35 in
165 mph	B	26 in	43 in	40 in	38 in	48 in	48 in	35 in	47 in	48 in
	C	19 in	31 in	29 in	27 in	38 in	38 in	25 in	33 in	34 in
	D	16 in	26 in	24 in	23 in	32 in	32 in	21 in	28 in	29 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 69"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 21-30 psf

Modules in Portrait on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	C	42 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	D	36 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
115 mph	B	48 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	C	39 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	D	33 in	48 in	48 in	47 in	48 in	48 in	35 in	35 in	35 in
125 mph	B	46 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	C	33 in	48 in	48 in	47 in	48 in	48 in	35 in	35 in	35 in
	D	28 in	45 in	42 in	40 in	48 in	48 in	35 in	35 in	35 in
140 mph	B	37 in	48 in	48 in	48 in	48 in	48 in	35 in	35 in	35 in
	C	26 in	43 in	40 in	38 in	48 in	48 in	35 in	35 in	35 in
	D	22 in	36 in	33 in	32 in	44 in	44 in	29 in	35 in	35 in
150 mph	B	32 in	48 in	48 in	46 in	48 in	48 in	35 in	35 in	35 in
	C	23 in	37 in	34 in	33 in	45 in	45 in	30 in	35 in	35 in
	D	19 in	31 in	29 in	28 in	38 in	38 in	26 in	34 in	35 in
165 mph	B	26 in	43 in	40 in	38 in	48 in	48 in	35 in	35 in	35 in
	C	19 in	31 in	29 in	27 in	38 in	38 in	25 in	33 in	34 in
	D	16 in	26 in	24 in	23 in	32 in	32 in	21 in	28 in	29 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 69"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 31-40 psf

Modules in Portrait on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	48 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	42 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	D	36 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
115 mph	B	48 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	39 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	D	33 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
125 mph	B	46 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	33 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	D	28 in	45 in	42 in	40 in	43 in	43 in	27 in	27 in	27 in
140 mph	B	37 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	26 in	43 in	40 in	38 in	43 in	43 in	27 in	27 in	27 in
	D	22 in	36 in	33 in	32 in	43 in	43 in	27 in	27 in	27 in
150 mph	B	32 in	48 in	48 in	43 in	43 in	43 in	27 in	27 in	27 in
	C	23 in	37 in	34 in	33 in	43 in	43 in	27 in	27 in	27 in
	D	19 in	31 in	29 in	28 in	38 in	38 in	26 in	27 in	27 in
165 mph	B	26 in	43 in	40 in	38 in	43 in	43 in	27 in	27 in	27 in
	C	19 in	31 in	29 in	27 in	38 in	38 in	25 in	27 in	27 in
	D	16 in	26 in	24 in	23 in	32 in	32 in	21 in	27 in	27 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 69"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 41-50 psf

Modules in Portrait on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	46 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	42 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	D	36 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
115 mph	B	46 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	39 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	D	33 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
125 mph	B	46 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	33 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	D	28 in	45 in	42 in	35 in	35 in	35 in	22 in	22 in	22 in
140 mph	B	37 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	26 in	43 in	40 in	35 in	35 in	35 in	22 in	22 in	22 in
	D	22 in	36 in	33 in	32 in	35 in	35 in	22 in	22 in	22 in
150 mph	B	32 in	46 in	46 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	23 in	37 in	34 in	33 in	35 in	35 in	22 in	22 in	22 in
	D	19 in	31 in	29 in	28 in	35 in	35 in	22 in	22 in	22 in
165 mph	B	26 in	43 in	40 in	35 in	35 in	35 in	22 in	22 in	22 in
	C	19 in	31 in	29 in	27 in	35 in	35 in	22 in	22 in	22 in
	D	16 in	26 in	24 in	23 in	32 in	32 in	21 in	22 in	22 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 69"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.

Roof Snow Load 51-60 psf

Modules in Portrait on Gable/Hip Roof's										
Wind Speed ASCE 7-16	Exposure Category	7 deg. < Roof Pitch ≤ 20 deg.			20 deg. < Roof Pitch ≤ 27 deg.			27 deg. < Roof Pitch ≤ 45 deg.		
		Zones			Zones			Zones		
		1	2r	3, 2e	1	2e, 2r	3	1	2e, 2r	3
110 mph	B	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	36 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
115 mph	B	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	33 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
125 mph	B	39 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	33 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	28 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
140 mph	B	37 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	26 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	22 in	36 in	33 in	29 in	29 in	29 in	19 in	19 in	19 in
150 mph	B	32 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	23 in	37 in	34 in	29 in	29 in	29 in	19 in	19 in	19 in
	D	19 in	31 in	29 in	28 in	29 in	29 in	19 in	19 in	19 in
165 mph	B	26 in	39 in	39 in	29 in	29 in	29 in	19 in	19 in	19 in
	C	19 in	31 in	29 in	27 in	29 in	29 in	19 in	19 in	19 in
	D	16 in	26 in	24 in	23 in	29 in	29 in	19 in	19 in	19 in

Notes:

Represents spacing governed by snow load

- 1.) Values in above table represent the maximum allowable spacing in inches for EcoFasten Solar standoffs. The values are not applicable for building overhangs.
- 2.) Maximum allowed spacing approved by EcoFasten Solar is 48"
- 3.) Maximum allowed standoff uplift capacity = 432# (per testing results)
- 4.) Maximum allowed standoff lateral capacity = 390# (per product testing)
- 5.) Values based on a maximum module length of 69"
- 6.) Based on Risk Category II (ASCE 7-16) structures less than 30 feet in height
- 7.) Kzt, Ke & γe adjustment factors are all set to 1. No site specific engineering is included in this table. Project EOR shall verify.
- 8.) γa adjustment factor set to 0.8
- 9.) Effective Wind Area = area of individual PV module
- 10.) Edge Zones (2 & 3) are assumed to have 1/2 the tributary area of load as interior standoffs. Project EOR shall verify.