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Pegasus Solar™ Inc.
100 West Ohio Avenue
Richmond, CA 94804

November 5, 2018
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Attn: Mr. Kai Stephan, CEO

Subject: Pegasus Solar™ Mounting System for Composite Asphalt or Concrete Tile Roofs Supporting SnapNrack Solar Mounting Solutions, 100 Roof Mount System Rails Maximum Attachment Spacing

SML Job No.: 182-15

Dear Mr. Stephan:

We have analyzed the Pegasus Solar™ photovoltaic (PV) panel roof mount system for its use on a composite asphalt or concrete tile roofs in conjunction with the SnapNrack Series 100 Roof Mount System rail attached. It was determined that, for the configurations and criteria described below, this system is in compliance with the applicable sections of the following reference documents:

Codes: ASCE/SEI 7-10 Min. Design Loads for Buildings & Other Structures
California Building Code 2016 Edition
California Residential Building Code 2016 Edition
Other: Aluminum Design Manual, ADM 2015 Edition

This letter is intended to address the allowable attachment spacing for the Pegasus Solar™ Mounting systems with the SnapNrack 100 Roof Mount System rails.

We have reviewed the test data for Pegasus Solar™ Concrete Tile Roof and L-Foot Composite Asphalt Roof Solar Mounting System prepared by Western Technologies (WT), tested January 7, 2017, and by Applied Materials & Engineering (AME), tested September 20, 2017 respectively, in conjunction with the span tables from the SnapNrack 100 Roof Mount System – Structural Analysis letter by Norman Scheel Structural Engineer dated July 6, 2016. We have determined that, subject to the limitations outlined below, the Pegasus Solar™ L-Foot Composite Asphalt Roof or Concrete Tile Roof Solar Mounting System are suitable for use with the SnapNrack Series 100 Roof Mount System.

The values in the tables 1A-6C provided below represent the lowest value for the attachment spacing based on either the allowable loads of the Pegasus Solar™ concrete tile roof photovoltaic (PV) panel roof mount system or the maximum span of the Series 100 Roof Mount System rail recommended by the manufacturer. The values in the tables below shall be verified by the end user of this letter to comply with all the requirements of the rail manufacturers installation recommendations. These values are based on a maximum building height of 30 feet.

Concrete Tile Roof System

Table 1A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6063 Alloy													ASCE 7-10				
Wind Load - Zone 1																	
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190	
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2	
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9	
	0	0	116	110	104	99	95	91	87	83	80	77	75	70	62	55	
	10	8	114	110	104	99	95	91	87	83	80	77	75	70	62	55	
	20	15	89	89	89	89	89	89	87	83	80	77	75	70	62	55	
	30	23	75	75	75	75	75	75	75	75	75	75	75	70	62	55	
	40	31	66	66	66	66	66	66	66	66	66	66	66	66	62	55	
	50	39	60	60	60	60	60	60	60	60	60	60	60	60	59	57	55
	60	46	53	53	53	53	53	53	53	53	53	53	53	53	52	51	49
	70	54	45	45	45	45	45	45	45	45	45	45	45	45	45	45	44
	80	62	40	40	40	40	40	40	40	40	40	40	40	40	39	39	39
	100	77	36	36	36	36	36	36	36	36	36	36	36	36	35	35	35
120	92	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	

Table 1B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6063 Alloy													ASCE 7-10			
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	120	120	120	120	116	107	100	93	87	81	76	67	60	54
	10	8	112	111	110	109	108	103	99	93	87	81	76	67	60	54
	20	15	89	89	88	85	83	80	78	75	73	71	68	64	60	54
	30	23	75	75	75	75	74	72	70	68	66	64	62	59	55	52
	40	31	66	66	66	64	63	61	60	58	57	55	54	51	49	46
	50	39	59	58	57	56	54	53	52	51	50	49	48	46	44	42
	60	46	52	51	50	49	48	47	46	46	45	44	43	41	40	38
	70	54	46	45	45	44	43	42	42	41	40	40	39	37	36	35
	80	62	41	41	40	40	39	38	38	37	37	36	36	34	33	32
	100	77	37	37	37	36	36	35	35	34	34	33	33	32	31	30
120	92	34	34	34	33	33	32	32	32	31	31	30	29	29	28	

Table 1C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6063 Alloy													ASCE 7-10			
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	120	120	120	120	113	105	98	91	85	80	75	66	59	53
	10	8	112	111	110	109	108	104	98	91	85	80	75	66	59	53
	20	15	89	89	89	86	84	81	79	76	74	71	69	65	59	53
	30	23	75	75	75	75	75	73	71	69	67	65	63	59	56	53
	40	31	66	66	66	66	64	62	61	59	58	57	55	52	50	47
	50	39	60	59	58	57	56	55	54	52	51	50	49	47	45	43
	60	46	53	52	51	50	50	49	48	47	46	45	44	42	41	39
	70	54	47	47	46	45	45	44	43	42	42	41	40	39	37	36
	80	62	43	42	42	41	40	40	39	39	38	37	37	35	34	33
	100	77	39	38	38	37	37	36	36	35	35	34	34	33	32	31
120	92	36	35	35	35	34	34	33	33	32	32	31	30	29	29	

Concrete Tile Roof System

Table 2A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6063 Alloy															ASCE 7-10	
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	94	86	79	72	66	61	57	53	49	46	43	38	34	30
	10	8	94	86	79	72	66	61	57	53	49	46	43	38	34	30
	20	15	89	86	79	72	66	61	57	53	49	46	43	38	34	30
	30	23	75	75	75	72	66	61	57	53	49	46	43	38	34	30
	40	31	66	66	66	66	66	61	57	53	49	46	43	38	34	30
	50	39	60	60	60	60	60	60	57	53	49	46	43	38	34	30
	60	46	53	53	53	53	53	53	53	49	46	43	43	38	34	30
	70	54	45	45	45	45	45	45	45	45	45	45	43	38	34	30
	80	62	40	40	40	40	40	40	40	40	40	40	40	38	34	30
	100	77	36	36	36	36	36	36	36	36	36	36	36	35	34	30
120	92	32	32	32	32	32	32	32	32	32	32	32	32	32	30	

Table 2B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6063 Alloy															ASCE 7-10	
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	97	88	81	74	69	64	59	55	51	48	45	40	35	32
	10	8	97	88	81	74	69	64	59	55	51	48	45	40	35	32
	20	15	89	88	81	74	69	64	59	55	51	48	45	40	35	32
	30	23	75	75	75	74	69	64	59	55	51	48	45	40	35	32
	40	31	66	66	66	64	63	61	59	55	51	48	45	40	35	32
	50	39	59	58	57	56	54	53	52	51	50	48	45	40	35	32
	60	46	52	51	50	49	48	47	46	46	45	44	43	40	35	32
	70	54	46	45	45	44	43	42	42	41	40	40	39	37	35	32
	80	62	41	41	40	40	39	38	38	37	37	36	36	34	33	32
	100	77	37	37	37	36	36	35	35	34	34	33	33	32	31	30
120	92	34	34	34	33	33	32	32	32	31	31	30	29	29	28	

Table 2C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6063 Alloy															ASCE 7-10	
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	120	120	111	102	94	88	81	76	71	67	62	55	49	44
	10	8	112	111	110	102	94	88	81	76	71	67	62	55	49	44
	20	15	89	89	89	86	84	81	79	76	71	67	62	55	49	44
	30	23	75	75	75	75	75	73	71	69	67	65	62	55	49	44
	40	31	66	66	66	66	64	62	61	59	58	57	55	52	49	44
	50	39	60	59	58	57	56	55	54	52	51	50	49	47	45	43
	60	46	53	52	51	50	50	49	48	47	46	45	44	42	41	39
	70	54	47	47	46	45	45	44	43	42	42	41	40	39	37	36
	80	62	43	42	42	41	40	40	39	39	38	37	37	35	34	33
	100	77	39	38	38	37	37	36	36	35	35	34	34	33	32	31
120	92	36	35	35	35	34	34	33	33	32	32	31	30	29	29	

Concrete Tile Roof System

Table 3A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6063 Alloy															ASCE 7-10	
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	10	8	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	20	15	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	30	23	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	40	31	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	50	39	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	60	46	53	53	49	45	42	39	36	33	31	29	27	24	21	19
	70	54	45	45	45	45	42	39	36	33	31	29	27	24	21	19
	80	62	40	40	40	40	40	39	36	33	31	29	27	24	21	19
	100	77	36	36	36	36	36	36	36	33	31	29	27	24	21	19
120	92	32	32	32	32	32	32	32	32	31	29	27	24	21	19	

Table 3A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6063 Alloy															ASCE 7-10	
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	10	8	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	20	15	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	30	23	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	40	31	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	50	39	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	60	46	53	53	49	45	42	39	36	33	31	29	27	24	21	19
	70	54	45	45	45	45	42	39	36	33	31	29	27	24	21	19
	80	62	40	40	40	40	40	39	36	33	31	29	27	24	21	19
	100	77	36	36	36	36	36	36	36	33	31	29	27	24	21	19
120	92	32	32	32	32	32	32	32	32	31	29	27	24	21	19	

Table 3C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6063 Alloy															ASCE 7-10	
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	120	120	111	102	94	88	81	76	71	67	62	55	49	44
	10	8	112	111	110	102	94	88	81	76	71	67	62	55	49	44
	20	15	89	89	89	86	84	81	79	76	71	67	62	55	49	44
	30	23	75	75	75	75	75	73	71	69	67	65	62	55	49	44
	40	31	66	66	66	66	64	62	61	59	58	57	55	52	49	44
	50	39	60	59	58	57	56	55	54	52	51	50	49	47	45	43
	60	46	53	52	51	50	50	49	48	47	46	45	44	42	41	39
	70	54	47	47	46	45	45	44	43	42	42	41	40	39	37	36
	80	62	43	42	42	41	40	40	39	39	38	37	37	35	34	33
	100	77	39	38	38	37	37	36	36	35	35	34	34	33	32	31
120	92	36	35	35	35	34	34	33	33	32	32	31	30	29	29	

Concrete Tile Roof System

Table 4A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	140	132	125	119	114	109	104	98	91	85	80	70	62	55
	10	8	137	132	125	119	114	109	104	98	91	85	80	70	62	55
	20	15	106	106	106	106	106	105	103	98	91	85	80	70	62	55
	30	23	90	90	90	90	90	90	90	89	87	85	80	70	62	55
	40	31	76	76	76	76	76	76	75	74	73	71	70	68	62	55
	50	39	62	62	62	62	62	62	62	62	62	62	61	59	57	55
	60	46	53	53	53	53	53	53	53	53	53	53	53	52	51	49
	70	54	45	45	45	45	45	45	45	45	45	45	45	45	45	44
	80	62	40	40	40	40	40	40	40	40	40	40	40	39	39	39
	100	77	36	36	36	36	36	36	36	36	36	36	36	35	35	35
	120	92	32	32	32	32	32	32	32	32	32	32	32	32	32	32

Table 4B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	144	144	136	125	116	107	100	93	87	81	76	67	60	54
	10	8	126	121	117	112	108	103	99	93	87	81	76	67	60	54
	20	15	93	91	88	85	83	80	78	75	73	71	68	64	60	54
	30	23	82	80	78	76	74	72	70	68	66	64	62	59	55	52
	40	31	69	67	66	64	63	61	60	58	57	55	54	51	49	46
	50	39	59	58	57	56	54	53	52	51	50	49	48	46	44	42
	60	46	52	51	50	49	48	47	46	46	45	44	43	41	40	38
	70	54	46	45	45	44	43	42	42	41	40	40	39	37	36	35
	80	62	41	41	40	40	39	38	38	37	37	36	36	34	33	32
	100	77	37	37	37	36	36	35	35	34	34	33	33	32	31	30
	120	92	34	34	34	33	33	32	32	32	31	31	30	29	29	28

Table 4C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	144	144	132	122	113	105	98	91	85	80	75	66	59	53
	10	8	127	122	117	113	108	104	98	91	85	80	75	66	59	53
	20	15	95	92	89	86	84	81	79	76	74	71	69	65	59	53
	30	23	84	81	79	77	75	73	71	69	67	65	63	59	56	53
	40	31	70	69	67	66	64	62	61	59	58	57	55	52	50	47
	50	39	61	59	58	57	56	55	54	52	51	50	49	47	45	43
	60	46	53	52	51	50	50	49	48	47	46	45	44	42	41	39
	70	54	47	47	46	45	45	44	43	42	42	41	40	39	37	36
	80	62	43	42	42	41	40	40	39	39	38	37	37	35	34	33
	100	77	39	38	38	37	37	36	36	35	35	34	34	33	32	31
	120	92	36	35	35	35	34	34	33	33	32	32	31	30	29	29

Concrete Tile Roof System

Table 5A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	94	86	79	72	66	61	57	53	49	46	43	38	34	30
	10	8	94	86	79	72	66	61	57	53	49	46	43	38	34	30
	20	15	94	86	79	72	66	61	57	53	49	46	43	38	34	30
	30	23	90	86	79	72	66	61	57	53	49	46	43	38	34	30
	40	31	76	76	76	72	66	61	57	53	49	46	43	38	34	30
	50	39	62	62	62	62	62	61	57	53	49	46	43	38	34	30
	60	46	53	53	53	53	53	53	53	53	49	46	43	38	34	30
	70	54	45	45	45	45	45	45	45	45	45	45	43	38	34	30
	80	62	40	40	40	40	40	40	40	40	40	40	40	38	34	30
	100	77	36	36	36	36	36	36	36	36	36	36	36	35	34	30
120	92	32	32	32	32	32	32	32	32	32	32	32	32	32	30	

Table 5B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	97	88	81	74	69	64	59	55	51	48	45	40	35	32
	10	8	97	88	81	74	69	64	59	55	51	48	45	40	35	32
	20	15	93	88	81	74	69	64	59	55	51	48	45	40	35	32
	30	23	82	80	78	74	69	64	59	55	51	48	45	40	35	32
	40	31	69	67	66	64	63	61	59	55	51	48	45	40	35	32
	50	39	59	58	57	56	54	53	52	51	50	48	45	40	35	32
	60	46	52	51	50	49	48	47	46	46	45	44	43	40	35	32
	70	54	46	45	45	44	43	42	42	41	40	40	39	37	35	32
	80	62	41	41	40	40	39	38	38	37	37	36	36	34	33	32
	100	77	37	37	37	36	36	35	35	34	34	33	33	32	31	30
120	92	34	34	34	33	33	32	32	32	31	31	30	29	29	28	

Table 5C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	131	120	111	102	94	88	81	76	71	67	62	55	49	44
	10	8	127	120	111	102	94	88	81	76	71	67	62	55	49	44
	20	15	95	92	89	86	84	81	79	76	71	67	62	55	49	44
	30	23	84	81	79	77	75	73	71	69	67	65	62	55	49	44
	40	31	70	69	67	66	64	62	61	59	58	57	55	52	49	44
	50	39	61	59	58	57	56	55	54	52	51	50	49	47	45	43
	60	46	53	52	51	50	50	49	48	47	46	45	44	42	41	39
	70	54	47	47	46	45	45	44	43	42	42	41	40	39	37	36
	80	62	43	42	42	41	40	40	39	39	38	37	37	35	34	33
	100	77	39	38	38	37	37	36	36	35	35	34	34	33	32	31
120	92	36	35	35	35	34	34	33	33	32	31	31	30	29	29	

Concrete Tile Roof System

Table 6A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	10	8	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	20	15	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	30	23	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	40	31	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	50	39	59	54	49	45	42	39	36	33	31	29	27	24	21	19
	60	46	53	53	49	45	42	39	36	33	31	29	27	24	21	19
	70	54	45	45	45	45	42	39	36	33	31	29	27	24	21	19
	80	62	40	40	40	40	40	39	36	33	31	29	27	24	21	19
	100	77	36	36	36	36	36	36	36	33	31	29	27	24	21	19
120	92	32	32	32	32	32	32	32	32	31	29	27	24	21	19	

Table 6B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	63	57	52	48	44	41	38	36	33	31	29	26	23	20
	10	8	63	57	52	48	44	41	38	36	33	31	29	26	23	20
	20	15	63	57	52	48	44	41	38	36	33	31	29	26	23	20
	30	23	63	57	52	48	44	41	38	36	33	31	29	26	23	20
	40	31	63	57	52	48	44	41	38	36	33	31	29	26	23	20
	50	39	59	57	52	48	44	41	38	36	33	31	29	26	23	20
	60	46	52	51	50	48	44	41	38	36	33	31	29	26	23	20
	70	54	46	45	45	44	43	41	38	36	33	31	29	26	23	20
	80	62	41	41	40	40	39	38	38	36	33	31	29	26	23	20
	100	77	37	37	37	36	36	35	35	34	33	31	29	26	23	20
120	92	34	34	34	33	33	32	32	32	31	31	29	26	23	20	

Table 6C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	131	120	111	102	94	88	81	76	71	67	62	55	49	44
	10	8	127	120	111	102	94	88	81	76	71	67	62	55	49	44
	20	15	95	92	89	86	84	81	79	76	71	67	62	55	49	44
	30	23	84	81	79	77	75	73	71	69	67	65	62	55	49	44
	40	31	70	69	67	66	64	62	61	59	58	57	55	52	49	44
	50	39	61	59	58	57	56	55	54	52	51	50	49	47	45	43
	60	46	53	52	51	50	50	49	48	47	46	45	44	42	41	39
	70	54	47	47	46	45	45	44	43	42	42	41	40	39	37	36
	80	62	43	42	42	41	40	40	39	39	38	37	37	35	34	33
	100	77	39	38	38	37	37	36	36	35	35	34	34	33	32	31
120	92	36	35	35	35	34	34	33	33	32	32	31	30	29	29	

The values in the tables 7A-12C provided below represent the lowest value for the attachment spacing based on either the allowable loads of the Pegasus Solar™ L-foot composite asphalt roof photovoltaic (PV) panel roof mount system or the maximum span of the Series 100 Roof Mount System rail recommended by the manufacturer. The values in the tables below shall be verified by the end user of this letter to comply with all the requirements of the rail manufacturers installation recommendations. These values are based on a maximum building height of 30 feet.

Composite Asphalt Roof System

Table 7A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6063 Alloy														ASCE 7-10			
Wind Load - Zone 1																	
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190	
	q ^h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2	
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9	
	0	0	116	110	104	99	95	91	87	83	80	77	75	70	65	62	
	10	8	114	110	104	99	95	91	87	83	80	77	75	70	65	62	
	20	15	89	89	89	89	89	89	87	83	80	77	75	70	65	62	
	30	23	75	75	75	75	75	75	75	75	75	75	75	70	65	62	
	40	31	66	66	66	66	66	66	66	66	66	66	66	66	65	62	
	50	39	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
	60	46	55	55	55	55	55	55	55	55	55	55	55	55	55	55	
	70	54	51	51	51	51	51	51	51	51	51	51	51	51	48	48	48
	80	62	48	48	48	48	48	48	48	48	48	48	48	48	42	42	42
	100	77	43	43	43	43	43	43	43	43	43	43	43	43	38	38	38
120	92	40	40	40	40	40	40	40	40	40	40	40	40	34	34	34	

Table 7B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6063 Alloy														ASCE 7-10			
Wind Load - Zone 1																	
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190	
	q ^h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2	
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9	
	0	0	120	120	120	120	120	118	112	108	103	97	92	82	74	67	
	10	8	112	111	110	109	108	107	105	104	103	97	92	82	74	67	
	20	15	89	89	89	89	89	89	88	88	87	84	81	75	70	65	
	30	23	75	75	75	75	75	75	75	75	75	75	75	70	65	61	
	40	31	66	66	66	66	66	66	66	66	66	66	66	63	59	55	
	50	39	60	60	60	60	60	60	60	60	60	60	60	57	54	51	
	60	46	55	55	55	55	55	55	55	55	55	55	55	52	49	47	
	70	54	51	51	51	51	51	51	51	51	51	51	51	50	48	46	43
	80	62	48	48	48	48	48	48	48	48	48	47	46	44	42	40	
	100	77	43	43	43	43	43	43	43	43	43	43	43	41	40	38	
120	92	40	40	40	40	40	40	40	40	40	40	40	39	37	36		

Table 7C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6063 Alloy														ASCE 7-10		
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q ^h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	120	120	120	120	120	120	116	110	103	98	92	82	74	67
	10	8	112	111	110	109	108	107	105	104	103	98	92	82	74	67
	20	15	89	89	89	89	89	89	88	88	87	87	85	78	73	67
	30	23	75	75	75	75	75	75	75	75	75	75	75	73	68	64
	40	31	66	66	66	66	66	66	66	66	66	66	66	66	62	58
	50	39	60	60	60	60	60	60	60	60	60	60	60	60	57	54
	60	46	55	55	55	55	55	55	55	55	55	55	55	55	53	50
	70	54	51	51	51	51	51	51	51	51	51	51	51	51	49	47
	80	62	48	48	48	48	48	48	48	48	48	48	48	48	46	44
	100	77	43	43	43	43	43	43	43	43	43	43	43	43	43	41
120	92	40	40	40	40	40	40	40	40	40	40	40	40	40	39	

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Table 8A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6063 Alloy															ASCE 7-10		
Wind Load - Zone 2																	
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190	
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2	
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9	
	0	0	116	110	104	99	95	91	87	83	80	77	75	70	62	56	
	10	8	114	110	104	99	95	91	87	83	80	77	75	70	62	56	
	20	15	89	89	89	89	89	89	87	83	80	77	75	70	62	56	
	30	23	75	75	75	75	75	75	75	75	75	75	75	70	62	56	
	40	31	66	66	66	66	66	66	66	66	66	66	66	66	62	56	
	50	39	60	60	60	60	60	60	60	60	60	60	60	60	60	56	
	60	46	55	55	55	55	55	55	55	55	55	55	55	55	55	55	
	70	54	51	51	51	51	51	51	51	51	51	51	51	48	48	48	
	80	62	48	48	48	48	48	48	48	48	48	48	48	48	42	42	42
	100	77	43	43	43	43	43	43	43	43	43	43	43	43	38	38	38
120	92	40	40	40	40	40	40	40	40	40	40	40	40	34	34	34	

Table 8B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6063 Alloy															ASCE 7-10		
Wind Load - Zone 2																	
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190	
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2	
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9	
	0	0	120	120	120	120	120	118	110	102	95	89	84	74	66	59	
	10	8	112	111	110	109	108	107	105	102	95	89	84	74	66	59	
	20	15	89	89	89	89	89	89	88	88	87	84	81	74	66	59	
	30	23	75	75	75	75	75	75	75	75	75	75	75	70	65	59	
	40	31	66	66	66	66	66	66	66	66	66	66	66	63	59	55	
	50	39	60	60	60	60	60	60	60	60	60	60	60	60	57	54	51
	60	46	55	55	55	55	55	55	55	55	55	55	55	55	52	49	47
	70	54	51	51	51	51	51	51	51	51	51	51	50	48	46	43	
	80	62	48	48	48	48	48	48	48	48	48	47	46	44	42	40	
	100	77	43	43	43	43	43	43	43	43	43	43	43	43	41	40	38
120	92	40	40	40	40	40	40	40	40	40	40	40	40	39	37	36	

Table 8C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6063 Alloy															ASCE 7-10	
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	120	120	120	120	120	120	116	110	103	98	92	82	74	67
	10	8	112	111	110	109	108	107	105	104	103	98	92	82	74	67
	20	15	89	89	89	89	89	89	88	88	87	87	85	78	73	67
	30	23	75	75	75	75	75	75	75	75	75	75	75	73	68	64
	40	31	66	66	66	66	66	66	66	66	66	66	66	66	62	58
	50	39	60	60	60	60	60	60	60	60	60	60	60	60	57	54
	60	46	55	55	55	55	55	55	55	55	55	55	55	55	53	50
	70	54	51	51	51	51	51	51	51	51	51	51	51	51	49	47
	80	62	48	48	48	48	48	48	48	48	48	48	48	48	46	44
	100	77	43	43	43	43	43	43	43	43	43	43	43	43	43	41
120	92	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39

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Table 9A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6063 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	110	100	92	84	78	72	67	62	58	54	51	45	40	36
	10	8	110	100	92	84	78	72	67	62	58	54	51	45	40	36
	20	15	89	89	89	84	78	72	67	62	58	54	51	45	40	36
	30	23	75	75	75	75	75	72	67	62	58	54	51	45	40	36
	40	31	66	66	66	66	66	66	66	62	58	54	51	45	40	36
	50	39	60	60	60	60	60	60	60	60	58	54	51	45	40	36
	60	46	55	55	55	55	55	55	55	55	55	54	51	45	40	36
	70	54	51	51	51	51	51	51	51	51	51	51	51	45	40	36
	80	62	48	48	48	48	48	48	48	48	48	48	48	42	40	36
	100	77	43	43	43	43	43	43	43	43	43	43	43	38	38	36
120	92	40	40	40	40	40	40	40	40	40	40	40	34	34	34	

Table 9B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6063 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	117	106	98	90	83	77	71	66	62	58	54	48	43	38
	10	8	112	106	98	90	83	77	71	66	62	58	54	48	43	38
	20	15	89	89	89	89	83	77	71	66	62	58	54	48	43	38
	30	23	75	75	75	75	75	75	71	66	62	58	54	48	43	38
	40	31	66	66	66	66	66	66	66	66	62	58	54	48	43	38
	50	39	60	60	60	60	60	60	60	60	60	58	54	48	43	38
	60	46	55	55	55	55	55	55	55	55	55	55	54	48	43	38
	70	54	51	51	51	51	51	51	51	51	51	51	50	48	43	38
	80	62	48	48	48	48	48	48	48	48	48	47	46	44	42	38
	100	77	43	43	43	43	43	43	43	43	43	43	43	41	40	38
120	92	40	40	40	40	40	40	40	40	40	40	40	39	37	36	

Table 9C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6063 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	120	120	120	120	120	120	116	110	103	98	92	82	74	67
	10	8	112	111	110	109	108	107	105	104	103	98	92	82	74	67
	20	15	89	89	89	89	89	89	88	88	87	87	85	78	73	67
	30	23	75	75	75	75	75	75	75	75	75	75	75	73	68	64
	40	31	66	66	66	66	66	66	66	66	66	66	66	66	62	58
	50	39	60	60	60	60	60	60	60	60	60	60	60	60	57	54
	60	46	55	55	55	55	55	55	55	55	55	55	55	55	53	50
	70	54	51	51	51	51	51	51	51	51	51	51	51	51	49	47
	80	62	48	48	48	48	48	48	48	48	48	48	48	48	46	44
	100	77	43	43	43	43	43	43	43	43	43	43	43	43	43	41
120	92	40	40	40	40	40	40	40	40	40	40	40	40	40	39	

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Table 10A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	140	132	125	119	114	109	104	100	96	93	89	84	79	74
	10	8	137	132	125	119	114	109	104	100	96	93	89	84	79	74
	20	15	106	106	106	106	106	106	104	100	96	93	89	84	79	74
	30	23	90	90	90	90	90	90	90	90	90	90	89	84	79	74
	40	31	79	79	79	79	79	79	79	79	79	79	79	78	75	72
	50	39	72	72	72	72	72	72	72	72	72	72	71	66	66	63
	60	46	65	65	65	65	65	65	65	65	65	64	63	56	56	56
	70	54	56	56	56	56	56	56	56	56	56	56	56	48	48	48
	80	62	50	50	50	50	50	50	50	50	50	50	50	42	42	42
	100	77	44	44	44	44	44	44	44	44	44	44	44	38	38	38
120	92	40	40	40	40	40	40	40	40	40	40	40	34	34	34	

Table 10B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	144	144	144	142	132	124	117	110	103	97	92	82	74	67
	10	8	134	133	132	130	127	121	115	110	103	97	92	82	74	67
	20	15	106	106	106	105	102	98	94	91	87	84	81	75	70	65
	30	23	90	90	90	90	90	89	86	83	80	77	75	70	65	61
	40	31	79	79	79	79	79	78	75	73	71	69	67	63	59	55
	50	39	72	72	72	72	71	69	67	65	63	62	60	57	54	51
	60	46	66	66	66	65	63	62	60	59	57	56	55	52	49	47
	70	54	62	61	60	58	57	56	55	54	52	51	50	48	46	43
	80	62	55	55	54	53	52	51	50	49	48	47	46	44	42	40
	100	77	49	49	49	49	48	47	46	45	45	44	43	41	40	38
120	92	44	44	44	44	44	44	43	42	42	41	40	39	37	36	

Table 10C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 1																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _h		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	144	144	144	142	133	124	117	110	103	98	92	82	74	67
	10	8	134	133	132	130	129	124	117	110	103	98	92	82	74	67
	20	15	106	106	106	106	106	103	99	95	92	88	85	78	73	67
	30	23	90	90	90	90	90	90	90	88	85	82	79	73	68	64
	40	31	79	79	79	79	79	79	79	78	76	73	71	66	62	58
	50	39	72	72	72	72	72	72	72	70	68	66	64	61	57	54
	60	46	66	66	66	66	66	66	66	64	62	61	59	56	53	50
	70	54	62	62	62	62	62	61	60	59	57	56	54	52	49	47
	80	62	58	58	58	58	58	56	55	54	53	52	50	48	46	44
	100	77	52	52	52	52	52	52	51	50	49	48	47	45	43	41
120	92	48	48	48	48	48	48	48	47	46	45	44	42	40	39	

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Table 11A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	140	132	125	119	114	109	104	98	91	85	80	70	62	56
	10	8	137	132	125	119	114	109	104	98	91	85	80	70	62	56
	20	15	106	106	106	106	106	106	104	98	91	85	80	70	62	56
	30	23	90	90	90	90	90	90	90	90	90	85	80	70	62	56
	40	31	79	79	79	79	79	79	79	79	79	79	79	70	62	56
	50	39	72	72	72	72	72	72	72	72	72	72	71	66	62	56
	60	46	65	65	65	65	65	65	65	65	65	64	63	56	56	56
	70	54	56	56	56	56	56	56	56	56	56	56	56	48	48	48
	80	62	50	50	50	50	50	50	50	50	50	50	50	42	42	42
	100	77	44	44	44	44	44	44	44	44	44	44	44	38	38	38
120	92	40	40	40	40	40	40	40	40	40	40	40	34	34	34	

Table 11B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	144	144	144	139	128	118	110	102	95	89	84	74	66	59
	10	8	134	133	132	130	127	118	110	102	95	89	84	74	66	59
	20	15	106	106	106	105	102	98	94	91	87	84	81	74	66	59
	30	23	90	90	90	90	90	89	86	83	80	77	75	70	65	59
	40	31	79	79	79	79	79	78	75	73	71	69	67	63	59	55
	50	39	72	72	72	72	71	69	67	65	63	62	60	57	54	51
	60	46	66	66	66	65	63	62	60	59	57	56	55	52	49	47
	70	54	62	61	60	58	57	56	55	54	52	51	50	48	46	43
	80	62	55	55	54	53	52	51	50	49	48	47	46	44	42	40
	100	77	49	49	49	49	48	47	46	45	45	44	43	41	40	38
120	92	44	44	44	44	44	44	43	42	42	41	40	39	37	36	

Table 11C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 2																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	q _n		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	P _g	P _s	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	144	144	144	142	133	124	117	110	103	98	92	82	74	67
	10	8	134	133	132	130	129	124	117	110	103	98	92	82	74	67
	20	15	106	106	106	106	106	103	99	95	92	88	85	78	73	67
	30	23	90	90	90	90	90	90	90	88	85	82	79	73	68	64
	40	31	79	79	79	79	79	79	79	78	76	73	71	66	62	58
	50	39	72	72	72	72	72	72	72	70	68	66	64	61	57	54
	60	46	66	66	66	66	66	66	66	64	62	61	59	56	53	50
	70	54	62	62	62	62	62	61	60	59	57	56	54	52	49	47
	80	62	58	58	58	58	58	56	55	54	53	52	50	48	46	44
	100	77	52	52	52	52	52	52	51	50	49	48	47	45	43	41
120	92	48	48	48	48	48	48	48	47	46	45	44	42	40	39	

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Table 12A: Rail Spans (in) for Roof Slopes and Tilt Angles 0° to 19° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	110	100	92	84	78	72	67	62	58	54	51	45	40	36
	10	8	110	100	92	84	78	72	67	62	58	54	51	45	40	36
	20	15	106	100	92	84	78	72	67	62	58	54	51	45	40	36
	30	23	90	90	90	84	78	72	67	62	58	54	51	45	40	36
	40	31	79	79	79	79	78	72	67	62	58	54	51	45	40	36
	50	39	72	72	72	72	72	72	67	62	58	54	51	45	40	36
	60	46	65	65	65	65	65	65	65	62	58	54	51	45	40	36
	70	54	56	56	56	56	56	56	56	56	56	54	51	45	40	36
	80	62	50	50	50	50	50	50	50	50	50	50	50	42	40	36
	100	77	44	44	44	44	44	44	44	44	44	44	44	38	38	36
120	92	40	40	40	40	40	40	40	40	40	40	40	34	34	34	

Table 12B: Rail Spans (in) for Roof Slopes and Tilt Angles 20° to 36° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	117	106	98	90	83	77	71	66	62	58	54	48	43	38
	10	8	117	106	98	90	83	77	71	66	62	58	54	48	43	38
	20	15	106	106	98	90	83	77	71	66	62	58	54	48	43	38
	30	23	90	90	90	90	83	77	71	66	62	58	54	48	43	38
	40	31	79	79	79	79	79	77	71	66	62	58	54	48	43	38
	50	39	72	72	72	72	71	69	67	65	62	58	54	48	43	38
	60	46	66	66	66	65	63	62	60	59	57	56	54	48	43	38
	70	54	62	61	60	58	57	56	55	54	52	51	50	48	43	38
	80	62	55	55	54	53	52	51	50	49	48	47	46	44	42	38
	100	77	49	49	49	49	48	47	46	45	45	44	43	41	40	38
120	92	44	44	44	44	44	44	43	42	42	41	40	39	37	36	

Table 12C: Rail Spans (in) for Roof Slopes and Tilt Angles 37° to 45° 6005 Alloy														ASCE 7-10		
Wind Load - Zone 3																
Ground Snow Load (psf)	Vult		110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh		15.5	16.9	18.4	20.0	21.6	23.3	25.1	26.9	28.8	30.7	32.8	37.0	41.5	46.2
	Pg	Ps	-10.7	-11.7	-12.7	-13.8	-14.9	-16.1	-17.3	-18.6	-19.9	-21.2	-22.6	-25.5	-28.6	-31.9
	0	0	144	144	144	142	133	124	117	110	103	98	92	82	74	67
	10	8	134	133	132	130	129	124	117	110	103	98	92	82	74	67
	20	15	106	106	106	106	106	103	99	95	92	88	85	78	73	67
	30	23	90	90	90	90	90	90	90	88	85	82	79	73	68	64
	40	31	79	79	79	79	79	79	79	78	76	73	71	66	62	58
	50	39	72	72	72	72	72	72	72	70	68	66	64	61	57	54
	60	46	66	66	66	66	66	66	66	64	62	61	59	56	53	50
	70	54	62	62	62	62	62	61	60	59	57	56	54	52	49	47
	80	62	58	58	58	58	58	56	55	54	53	52	50	48	46	44
	100	77	52	52	52	52	52	52	51	50	49	48	47	45	43	41
120	92	48	48	48	48	48	48	48	47	46	45	44	42	40	39	

Our analysis assumes that the connections and associated hardware are installed in a workmanlike manner in accordance with the Mount Installation Manual and generally accepted standards of construction practice. It is the responsibility of the contractor to verify that the roof framing can safely support the loads imposed by the addition of the PV array. Starling Madison Lofquist, Inc. and Pegasus Solar™ assume no liability beyond what is specifically shown in this letter. Additional information is available at the Pegasus Solar™ web site, <http://pegasussolar.com/>

Please feel free to contact me at your convenience if you have any questions.

Respectfully yours,

Jesse Light, S.E.
Sr. Structural Engineer

Rusmir Begic, E.I.T., M.S.E.
Structural Designer