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

November 19, 2018
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Attn: Mr. Kai Stephan, CEO

Subject: Pegasus Solar™ Mounting System for Composite Asphalt or Concrete Tile Roofs Supporting UniRac SolarMount 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 roof in conjunction with the UniRac SolarMount 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 UniRac SolarMount rail system.

We have reviewed the test data for the 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 UniRac SolarMount Rail, SolarMount Design & Engineering Guide – Structural Analysis letter by PZSE, Inc. dated January 4, 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 is suitable for use with the UniRac SolarMount rail.

The values in tables 1-9 provided below represent the lowest value for the attachment spacing based on the allowable loads of the Pegasus Solar™ concrete tile roof photovoltaic (PV) panel roof mount system. The maximum span of the SolarMount rail must be determined using the SolarMount Design & Engineering Guide as recommended by the manufacturer. The maximum span to use for installation shall be the smaller of the maximum Pegasus Solar™ attachment spacing per the tables below and the maximum span determined from the SolarMount Design & Engineering Guide. 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 1 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 0 to 6 Degrees - Roof Zone 1											
	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	175	126	110	90	73	62	53	47	42
	105	200	175	126	110	90	73	62	53	47	42
	110	200	175	126	110	90	73	62	53	47	42
	120	200	175	126	110	90	73	62	53	47	42
	130	180	175	126	110	90	73	62	53	47	42
	140	153	153	126	110	90	73	62	53	47	42
	150	131	131	126	110	90	73	62	53	47	42
	160	114	114	114	110	90	73	62	53	47	42
	170	100	100	100	99	77	63	53	46	40	36
Category C	100	200	175	126	110	90	73	62	53	47	42
	105	199	175	126	110	90	73	62	53	47	42
	110	179	175	126	110	90	73	62	53	47	42
	120	148	148	126	110	90	73	62	53	47	42
	130	124	124	124	110	90	73	62	53	47	42
	140	106	106	106	106	90	73	62	53	47	42
	150	91	91	91	91	90	73	62	53	47	42
	160	80	80	80	80	80	73	62	53	47	42
	170	70	70	70	70	70	63	53	46	40	36
Category D	100	184	175	126	110	90	73	62	53	47	42
	105	165	165	126	110	90	73	62	53	47	42
	110	149	149	126	110	90	73	62	53	47	42
	120	123	123	123	110	90	73	62	53	47	42
	130	104	104	104	104	90	73	62	53	47	42
	140	88	88	88	88	88	73	62	53	47	42
	150	76	76	76	76	76	73	62	53	47	42
	160	67	67	67	67	67	67	62	53	47	42
	170	59	59	59	59	59	59	53	46	40	36

Concrete Tile Roof System

Table 2 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 7 to 27 Degrees - Roof Zone 1											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	158	112	97	76	62	53	45	40	36
	105	200	158	112	97	76	62	53	45	40	36
	110	200	158	112	97	76	62	53	45	40	36
	120	200	158	112	97	76	62	53	45	40	36
	130	188	158	112	97	76	62	53	45	40	36
	140	161	158	112	97	76	62	53	45	40	36
	150	140	140	110	95	76	62	53	45	40	36
	160	122	122	105	92	76	62	53	45	40	36
Category C	170	108	108	101	89	74	62	52	45	39	35
	100	200	158	112	97	76	62	53	45	40	36
	105	200	158	112	97	76	62	53	45	40	36
	110	188	158	112	97	76	62	53	45	40	36
	120	156	156	112	97	76	62	53	45	40	36
	130	132	132	108	94	76	62	53	45	40	36
	140	113	113	103	90	75	62	53	45	40	36
	150	98	98	98	87	73	62	53	45	40	36
Category D	160	86	86	86	83	70	61	53	45	40	36
	170	76	76	76	76	67	58	52	45	39	35
	100	192	158	112	97	76	62	53	45	40	36
	105	173	158	112	97	76	62	53	45	40	36
	110	157	157	112	97	76	62	53	45	40	36
	120	131	131	108	94	76	62	53	45	40	36
	130	111	111	102	90	75	62	53	45	40	36
	140	95	95	95	86	72	62	53	45	40	36
150	83	83	83	82	69	60	53	45	40	36	
160	72	72	72	72	67	58	51	45	40	36	
170	64	64	64	64	64	64	56	49	44	39	35

Concrete Tile Roof System

Table 3 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 28 to 45 Degrees - Roof Zone 1											
	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	166	124	109	92	76	65	56	50	45
	105	200	166	124	109	92	76	65	56	50	45
	110	198	163	122	108	91	76	65	56	50	45
	120	176	152	116	103	87	76	65	56	50	45
	130	157	141	109	98	84	73	65	56	50	45
	140	136	131	103	93	80	70	63	56	50	45
	150	119	119	97	88	76	67	60	55	50	45
	160	105	105	91	83	73	65	58	53	48	44
Category C	170	93	93	86	79	69	62	56	51	47	43
	100	179	153	117	104	88	76	65	56	50	45
	105	167	147	113	101	86	75	65	56	50	45
	110	157	140	109	98	83	73	65	56	50	45
	120	132	129	102	92	79	70	62	56	50	45
	130	113	113	95	86	75	66	59	54	49	45
	140	98	98	88	81	71	63	57	52	47	44
	150	85	85	82	76	67	60	54	49	46	42
Category D	160	75	75	75	71	63	57	52	47	44	41
	170	66	66	66	66	59	54	49	45	42	39
	100	159	142	110	98	84	73	65	56	50	45
	105	146	135	106	95	82	71	64	56	50	45
	110	133	129	102	92	79	70	62	56	50	45
	120	112	112	94	86	75	66	59	54	49	45
	130	96	96	87	80	70	63	56	51	47	44
	140	83	83	81	74	66	59	54	49	45	42
150	72	72	72	69	62	56	51	47	43	40	
160	63	63	63	63	58	53	48	45	41	38	
170	56	56	56	56	54	50	46	42	39	37	

Concrete Tile Roof System

Table 4 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 0 to 6 Degrees - Roof Zone 2											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	168	168	126	110	90	73	62	53	47	42
	105	151	151	126	110	90	73	62	53	47	42
	110	136	136	126	110	90	73	62	53	47	42
	120	113	113	113	110	90	73	62	53	47	42
	130	95	95	95	95	90	73	62	53	47	42
	140	81	81	81	81	81	73	62	53	47	42
	150	70	70	70	70	70	70	62	53	47	42
	160	61	61	61	61	61	61	61	53	47	42
Category C	170	54	54	54	54	54	54	53	46	40	36
	100	116	116	116	110	90	73	62	53	47	42
	105	104	104	104	104	90	73	62	53	47	42
	110	94	94	94	94	90	73	62	53	47	42
	120	79	79	79	79	79	73	62	53	47	42
	130	66	66	66	66	66	66	62	53	47	42
	140	57	57	57	57	57	57	57	53	47	42
	150	49	49	49	49	49	49	49	49	47	42
Category D	160	43	43	43	43	43	43	43	43	43	42
	170	38	38	38	38	38	38	38	38	38	36
	100	97	97	97	97	90	73	62	53	47	42
	105	87	87	87	87	87	73	62	53	47	42
	110	79	79	79	79	79	73	62	53	47	42
	120	66	66	66	66	66	66	62	53	47	42
	130	56	56	56	56	56	56	56	53	47	42
	140	48	48	48	48	48	48	48	48	47	42
150	41	41	41	41	41	41	41	41	41	41	
160	36	36	36	36	36	36	36	36	36	36	
170	32	32	32	32	32	32	32	32	32	32	

Concrete Tile Roof System

Table 5 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 7 to 27 Degrees - Roof Zone 2											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	168	158	112	97	76	62	53	45	40	36
	105	151	151	112	97	76	62	53	45	40	36
	110	137	137	112	97	76	62	53	45	40	36
	120	115	115	112	97	76	62	53	45	40	36
	130	97	97	97	97	76	62	53	45	40	36
	140	83	83	83	83	76	62	53	45	40	36
	150	72	72	72	72	72	62	53	45	40	36
	160	63	63	63	63	63	62	53	45	40	36
Category C	170	56	56	56	56	56	56	52	45	39	35
	100	118	118	112	97	76	62	53	45	40	36
	105	107	107	107	97	76	62	53	45	40	36
	110	97	97	97	97	76	62	53	45	40	36
	120	81	81	81	81	76	62	53	45	40	36
	130	69	69	69	69	69	62	53	45	40	36
	140	59	59	59	59	59	59	53	45	40	36
	150	51	51	51	51	51	51	51	45	40	36
Category D	160	45	45	45	45	45	45	45	45	40	36
	170	40	40	40	40	40	40	40	40	39	35
	100	99	99	99	97	76	62	53	45	40	36
	105	90	90	90	90	76	62	53	45	40	36
	110	81	81	81	81	76	62	53	45	40	36
	120	68	68	68	68	68	62	53	45	40	36
	130	58	58	58	58	58	58	53	45	40	36
	140	50	50	50	50	50	50	50	45	40	36
150	43	43	43	43	43	43	43	43	40	36	
160	38	38	38	38	38	38	38	38	38	36	
170	33	33	33	33	33	33	33	33	33	33	

Concrete Tile Roof System

Table 6 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 28 to 45 Degrees - Roof Zone 2											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	166	124	109	92	76	65	56	50	45
	105	200	166	124	109	92	76	65	56	50	45
	110	183	163	122	108	91	76	65	56	50	45
	120	154	152	116	103	87	76	65	56	50	45
	130	132	132	109	98	84	73	65	56	50	45
	140	114	114	103	93	80	70	63	56	50	45
	150	99	99	97	88	76	67	60	55	50	45
	160	87	87	87	83	73	65	58	53	48	44
Category C	170	78	78	78	78	69	62	56	51	47	43
	100	158	153	117	104	88	76	65	56	50	45
	105	144	144	113	101	86	75	65	56	50	45
	110	131	131	109	98	83	73	65	56	50	45
	120	111	111	102	92	79	70	62	56	50	45
	130	94	94	94	86	75	66	59	54	49	45
	140	81	81	81	81	71	63	57	52	47	44
	150	71	71	71	71	67	60	54	49	46	42
Category D	160	62	62	62	62	62	57	52	47	44	41
	170	55	55	55	55	55	54	49	45	42	39
	100	134	134	110	98	84	73	65	56	50	45
	105	122	122	106	95	82	71	64	56	50	45
	110	111	111	102	92	79	70	62	56	50	45
	120	94	94	94	86	75	66	59	54	49	45
	130	80	80	80	80	70	63	56	51	47	44
	140	69	69	69	69	66	59	54	49	45	42
150	60	60	60	60	60	56	51	47	43	40	
160	53	53	53	53	53	53	48	45	41	38	
170	47	47	47	47	47	47	47	46	42	39	37

Concrete Tile Roof System

Table 7 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 0 to 6 Degrees - Roof Zone 3											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	104	104	104	104	90	73	62	53	47	42
	105	93	93	93	93	90	73	62	53	47	42
	110	85	85	85	85	85	73	62	53	47	42
	120	70	70	70	70	70	70	62	53	47	42
	130	60	60	60	60	60	60	60	53	47	42
	140	51	51	51	51	51	51	51	51	47	42
	150	44	44	44	44	44	44	44	44	44	42
	160	39	39	39	39	39	39	39	39	39	39
Category C	100	72	72	72	72	72	72	62	53	47	42
	105	65	65	65	65	65	65	62	53	47	42
	110	59	59	59	59	59	59	59	53	47	42
	120	49	49	49	49	49	49	49	49	47	42
	130	42	42	42	42	42	42	42	42	42	42
	140	36	36	36	36	36	36	36	36	36	36
	150	31	31	31	31	31	31	31	31	31	31
	160	27	27	27	27	27	27	27	27	27	27
Category D	100	61	61	61	61	61	61	61	53	47	42
	105	55	55	55	55	55	55	55	53	47	42
	110	50	50	50	50	50	50	50	50	47	42
	120	41	41	41	41	41	41	41	41	41	41
	130	35	35	35	35	35	35	35	35	35	35
	140	30	30	30	30	30	30	30	30	30	30
	150	26	26	26	26	26	26	26	26	26	26
	160	23	23	23	23	23	23	23	23	23	23
170	20	20	20	20	20	20	20	20	20	20	

Concrete Tile Roof System

Table 8 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 7 to 27 Degrees - Roof Zone 3											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	108	108	108	97	76	62	53	45	40	36
	105	97	97	97	97	76	62	53	45	40	36
	110	88	88	88	88	76	62	53	45	40	36
	120	74	74	74	74	74	62	53	45	40	36
	130	63	63	63	63	63	62	53	45	40	36
	140	54	54	54	54	54	54	53	45	40	36
	150	47	47	47	47	47	47	47	45	40	36
	160	41	41	41	41	41	41	41	41	40	36
Category C	170	36	36	36	36	36	36	36	36	36	35
	100	76	76	76	76	76	62	53	45	40	36
	105	69	69	69	69	69	62	53	45	40	36
	110	63	63	63	63	63	62	53	45	40	36
	120	52	52	52	52	52	52	52	45	40	36
	130	44	44	44	44	44	44	44	44	40	36
	140	38	38	38	38	38	38	38	38	38	36
	150	33	33	33	33	33	33	33	33	33	33
Category D	160	29	29	29	29	29	29	29	29	29	29
	170	26	26	26	26	26	26	26	26	26	26
	100	64	64	64	64	64	62	53	45	40	36
	105	58	58	58	58	58	58	53	45	40	36
	110	53	53	53	53	53	53	53	45	40	36
	120	44	44	44	44	44	44	44	44	40	36
	130	37	37	37	37	37	37	37	37	37	36
	140	32	32	32	32	32	32	32	32	32	32
150	28	28	28	28	28	28	28	28	28	28	
160	24	24	24	24	24	24	24	24	24	24	
170	22	22	22	22	22	22	22	22	22	22	

Concrete Tile Roof System

Table 9 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 28 to 45 Degrees - Roof Zone 3											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	166	124	109	92	76	65	56	50	45
	105	200	166	124	109	92	76	65	56	50	45
	110	183	163	122	108	91	76	65	56	50	45
	120	154	152	116	103	87	76	65	56	50	45
	130	132	132	109	98	84	73	65	56	50	45
	140	114	114	103	93	80	70	63	56	50	45
	150	99	99	97	88	76	67	60	55	50	45
	160	87	87	87	83	73	65	58	53	48	44
Category C	170	78	78	78	78	69	62	56	51	47	43
	100	158	153	117	104	88	76	65	56	50	45
	105	144	144	113	101	86	75	65	56	50	45
	110	131	131	109	98	83	73	65	56	50	45
	120	111	111	102	92	79	70	62	56	50	45
	130	94	94	94	86	75	66	59	54	49	45
	140	81	81	81	81	71	63	57	52	47	44
	150	71	71	71	71	67	60	54	49	46	42
Category D	160	62	62	62	62	62	57	52	47	44	41
	170	55	55	55	55	55	54	49	45	42	39
	100	134	134	110	98	84	73	65	56	50	45
	105	122	122	106	95	82	71	64	56	50	45
	110	111	111	102	92	79	70	62	56	50	45
	120	94	94	94	86	75	66	59	54	49	45
	130	80	80	80	80	70	63	56	51	47	44
	140	69	69	69	69	66	59	54	49	45	42
150	60	60	60	60	60	56	51	47	43	40	
160	53	53	53	53	53	53	53	48	45	41	38
170	47	47	47	47	47	47	47	46	42	39	37

The values in tables 10-19 provided below represent the lowest value for the attachment spacing based the allowable loads of the Pegasus Solar™ L-foot composite asphalt roof photovoltaic (PV) panel roof mount system. The maximum span of the SolarMount rail must be determined using the SolarMount Design & Engineering Guide as recommended by the manufacturer. The maximum span to use for installation shall be the smaller of the maximum Pegasus Solar™ attachment spacing per the tables below and the maximum span determined from the SolarMount Design & Engineering Guide. 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 10 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 0 to 6 Degrees - Roof Zone 1											
	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	183	133	116	97	80	67	58	51	46
	105	200	183	133	116	97	80	67	58	51	46
	110	200	183	133	116	97	80	67	58	51	46
	120	200	183	133	116	97	80	67	58	51	46
	130	200	183	133	116	97	80	67	58	51	46
	140	200	183	133	116	97	80	67	58	51	46
	150	200	183	133	116	97	80	67	58	51	46
	160	200	183	133	116	97	80	67	58	51	46
Category C	170	185	170	119	103	81	66	56	48	42	38
	100	200	183	133	116	97	80	67	58	51	46
	105	200	183	133	116	97	80	67	58	51	46
	110	200	183	133	116	97	80	67	58	51	46
	120	200	183	133	116	97	80	67	58	51	46
	130	200	183	133	116	97	80	67	58	51	46
	140	196	183	133	116	97	80	67	58	51	46
	150	169	169	133	116	97	80	67	58	51	46
Category D	160	147	147	132	116	96	80	67	58	51	46
	170	130	130	114	99	81	66	56	48	42	38
	100	200	183	133	116	97	80	67	58	51	46
	105	200	183	133	116	97	80	67	58	51	46
	110	200	183	133	116	97	80	67	58	51	46
	120	200	183	133	116	97	80	67	58	51	46
	130	192	183	133	116	97	80	67	58	51	46
	140	164	164	133	116	97	80	67	58	51	46
Category D	150	141	141	130	114	95	80	67	58	51	46
	160	123	123	123	110	92	80	67	58	51	46
	170	109	109	108	94	79	66	56	48	42	38

Composite Asphalt Roof System

Table 11 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 7 to 27 Degrees - Roof Zone 1											
	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	179	130	114	95	77	65	56	50	44
	105	200	179	130	114	95	77	65	56	50	44
	110	200	179	130	114	95	77	65	56	50	44
	120	200	179	130	114	95	77	65	56	50	44
	130	200	179	130	114	95	77	65	56	50	44
	140	200	179	130	114	95	77	65	56	50	44
	150	200	174	127	112	93	77	65	56	50	44
	160	200	164	122	107	90	77	65	56	50	44
Category C	170	183	151	112	99	83	71	60	52	46	41
	100	200	179	130	114	95	77	65	56	50	44
	105	200	179	130	114	95	77	65	56	50	44
	110	200	179	130	114	95	77	65	56	50	44
	120	200	179	130	114	95	77	65	56	50	44
	130	200	170	125	110	92	77	65	56	50	44
	140	190	159	119	105	88	76	65	56	50	44
	150	170	148	112	100	85	74	65	56	50	44
Category D	160	153	138	107	95	81	71	63	56	50	44
	170	138	126	98	87	75	65	58	52	46	41
	100	200	179	130	114	95	77	65	56	50	44
	105	200	179	130	114	95	77	65	56	50	44
	110	200	179	130	114	95	77	65	56	50	44
	120	200	169	125	110	92	77	65	56	50	44
	130	187	157	118	104	88	76	65	56	50	44
	140	166	145	111	99	84	73	65	56	50	44
Category D	150	148	135	105	94	80	70	62	56	50	44
	160	133	125	99	89	77	67	60	54	49	44
	170	119	114	90	81	70	62	55	50	45	41

Composite Asphalt Roof System

Table 12 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 28 to 45 Degrees - Roof Zone 1											
	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	200	158	142	121	106	94	82	72	65
	105	200	200	158	142	121	106	94	82	72	65
	110	200	200	156	140	120	105	93	82	72	65
	120	199	183	145	131	113	100	89	81	72	65
	130	175	167	135	123	107	95	85	77	71	65
	140	155	153	126	115	101	90	81	74	68	63
	150	138	138	117	108	96	86	78	71	65	61
	160	124	124	109	101	90	81	74	68	63	58
Category C	170	111	111	102	94	85	77	71	65	60	56
	100	200	186	147	133	114	101	90	81	72	65
	105	188	176	141	128	111	98	88	79	72	65
	110	175	167	135	123	107	95	85	77	71	65
	120	152	151	124	114	100	89	81	74	68	63
	130	132	132	114	105	93	84	76	70	64	60
	140	117	117	105	97	87	79	72	66	61	57
	150	103	103	96	90	81	74	68	63	58	55
Category D	160	92	92	89	83	76	69	64	59	55	52
	170	82	82	82	77	71	65	60	56	53	50
	100	178	169	136	124	108	96	86	78	71	65
	105	164	160	130	119	104	93	83	76	69	64
	110	152	151	124	114	100	90	81	74	68	63
	120	131	131	113	105	93	84	76	70	64	60
	130	114	114	103	96	86	78	71	66	61	57
	140	100	100	94	88	80	73	67	62	58	54
150	89	89	86	81	74	68	63	58	55	51	
160	79	79	79	75	69	63	59	55	52	49	
170	71	71	71	69	64	59	55	52	49	46	

Composite Asphalt Roof System

Table 13 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 0 to 6 Degrees - Roof Zone 2											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	183	133	116	97	80	67	58	51	46
	105	200	183	133	116	97	80	67	58	51	46
	110	200	183	133	116	97	80	67	58	51	46
	120	200	183	133	116	97	80	67	58	51	46
	130	176	176	133	116	97	80	67	58	51	46
	140	150	150	133	116	97	80	67	58	51	46
	150	130	130	130	116	97	80	67	58	51	46
	160	113	113	113	113	97	80	67	58	51	46
Category C	170	100	100	100	100	81	66	56	48	42	38
	100	200	183	133	116	97	80	67	58	51	46
	105	193	183	133	116	97	80	67	58	51	46
	110	175	175	133	116	97	80	67	58	51	46
	120	145	145	133	116	97	80	67	58	51	46
	130	123	123	123	116	97	80	67	58	51	46
	140	105	105	105	105	97	80	67	58	51	46
	150	91	91	91	91	91	80	67	58	51	46
Category D	160	80	80	80	80	80	80	67	58	51	46
	170	70	70	70	70	70	66	56	48	42	38
	100	179	179	133	116	97	80	67	58	51	46
	105	161	161	133	116	97	80	67	58	51	46
	110	146	146	133	116	97	80	67	58	51	46
	120	122	122	122	116	97	80	67	58	51	46
	130	103	103	103	103	97	80	67	58	51	46
	140	88	88	88	88	88	80	67	58	51	46
150	77	77	77	77	77	77	67	58	51	46	
160	67	67	67	67	67	67	67	67	58	51	46
170	59	59	59	59	59	59	59	56	48	42	38

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Table 14 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 7 to 27 Degrees - Roof Zone 2											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	179	130	114	95	77	65	56	50	44
	105	200	179	130	114	95	77	65	56	50	44
	110	200	179	130	114	95	77	65	56	50	44
	120	200	179	130	114	95	77	65	56	50	44
	130	182	179	130	114	95	77	65	56	50	44
	140	156	156	130	114	95	77	65	56	50	44
	150	135	135	127	112	93	77	65	56	50	44
	160	118	118	118	107	90	77	65	56	50	44
Category C	170	104	104	104	99	83	71	60	52	46	41
	100	200	179	130	114	95	77	65	56	50	44
	105	200	179	130	114	95	77	65	56	50	44
	110	181	179	130	114	95	77	65	56	50	44
	120	151	151	130	114	95	77	65	56	50	44
	130	128	128	125	110	92	77	65	56	50	44
	140	110	110	110	105	88	76	65	56	50	44
	150	95	95	95	95	85	74	65	56	50	44
Category D	160	84	84	84	84	81	71	63	56	50	44
	170	74	74	74	74	74	65	58	52	46	41
	100	185	179	130	114	95	77	65	56	50	44
	105	167	167	130	114	95	77	65	56	50	44
	110	152	152	130	114	95	77	65	56	50	44
	120	127	127	125	110	92	77	65	56	50	44
	130	108	108	108	104	88	76	65	56	50	44
	140	92	92	92	92	84	73	65	56	50	44
150	80	80	80	80	80	70	62	56	50	44	
160	70	70	70	70	70	70	67	60	54	49	44
170	62	62	62	62	62	62	62	55	50	45	41

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Table 15 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 28 to 45 Degrees - Roof Zone 2											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	200	158	142	121	106	94	82	72	65
	105	200	200	158	142	121	106	94	82	72	65
	110	200	200	156	140	120	105	93	82	72	65
	120	199	183	145	131	113	100	89	81	72	65
	130	175	167	135	123	107	95	85	77	71	65
	140	155	153	126	115	101	90	81	74	68	63
	150	138	138	117	108	96	86	78	71	65	61
	160	124	124	109	101	90	81	74	68	63	58
Category C	170	111	111	102	94	85	77	71	65	60	56
	100	200	186	147	133	114	101	90	81	72	65
	105	188	176	141	128	111	98	88	79	72	65
	110	175	167	135	123	107	95	85	77	71	65
	120	152	151	124	114	100	89	81	74	68	63
	130	132	132	114	105	93	84	76	70	64	60
	140	117	117	105	97	87	79	72	66	61	57
	150	103	103	96	90	81	74	68	63	58	55
Category D	160	92	92	89	83	76	69	64	59	55	52
	170	82	82	82	77	71	65	60	56	53	50
	100	178	169	136	124	108	96	86	78	71	65
	105	164	160	130	119	104	93	83	76	69	64
	110	152	151	124	114	100	90	81	74	68	63
	120	131	131	113	105	93	84	76	70	64	60
	130	114	114	103	96	86	78	71	66	61	57
	140	100	100	94	88	80	73	67	62	58	54
150	89	89	86	81	74	68	63	58	55	51	
160	79	79	79	75	69	63	59	55	52	49	
170	71	71	71	69	64	59	55	52	49	46	

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Table 16 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 0 to 6 Degrees - Roof Zone 3											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	192	183	133	116	97	80	67	58	51	46
	105	173	173	133	116	97	80	67	58	51	46
	110	157	157	133	116	97	80	67	58	51	46
	120	130	130	130	116	97	80	67	58	51	46
	130	110	110	110	110	97	80	67	58	51	46
	140	94	94	94	94	94	80	67	58	51	46
	150	82	82	82	82	82	80	67	58	51	46
	160	72	72	72	72	72	72	67	58	51	46
Category C	170	63	63	63	63	63	63	56	48	42	38
	100	134	134	133	116	97	80	67	58	51	46
	105	121	121	121	116	97	80	67	58	51	46
	110	110	110	110	110	97	80	67	58	51	46
	120	92	92	92	92	92	80	67	58	51	46
	130	78	78	78	78	78	78	67	58	51	46
	140	67	67	67	67	67	67	67	58	51	46
	150	58	58	58	58	58	58	58	58	51	46
Category D	160	51	51	51	51	51	51	51	51	51	46
	170	45	45	45	45	45	45	45	45	42	38
	100	112	112	112	112	97	80	67	58	51	46
	105	101	101	101	101	97	80	67	58	51	46
	110	92	92	92	92	92	80	67	58	51	46
	120	77	77	77	77	77	77	67	58	51	46
	130	65	65	65	65	65	65	65	58	51	46
	140	56	56	56	56	56	56	56	56	51	46
150	49	49	49	49	49	49	49	49	49	46	
160	43	43	43	43	43	43	43	43	43	43	
170	38	38	38	38	38	38	38	38	38	38	

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Table 17 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 7 to 27 Degrees - Roof Zone 3											
Exposure	Wind Speed	Ground Snow Load									
	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	179	130	114	95	77	65	56	50	44
	105	182	179	130	114	95	77	65	56	50	44
	110	165	165	130	114	95	77	65	56	50	44
	120	138	138	130	114	95	77	65	56	50	44
	130	117	117	117	114	95	77	65	56	50	44
	140	101	101	101	101	95	77	65	56	50	44
	150	87	87	87	87	87	77	65	56	50	44
	160	76	76	76	76	76	76	65	56	50	44
Category C	170	68	68	68	68	68	68	60	52	46	41
	100	142	142	130	114	95	77	65	56	50	44
	105	128	128	128	114	95	77	65	56	50	44
	110	117	117	117	114	95	77	65	56	50	44
	120	98	98	98	98	95	77	65	56	50	44
	130	83	83	83	83	83	77	65	56	50	44
	140	71	71	71	71	71	71	65	56	50	44
	150	62	62	62	62	62	62	62	56	50	44
Category D	160	54	54	54	54	54	54	54	54	50	44
	170	48	48	48	48	48	48	48	48	46	41
	100	119	119	119	114	95	77	65	56	50	44
	105	108	108	108	108	95	77	65	56	50	44
	110	98	98	98	98	95	77	65	56	50	44
	120	82	82	82	82	82	77	65	56	50	44
	130	70	70	70	70	70	70	65	56	50	44
	140	60	60	60	60	60	60	60	56	50	44
150	52	52	52	52	52	52	52	52	50	44	
160	46	46	46	46	46	46	46	46	46	44	
170	40	40	40	40	40	40	40	40	40	40	

Composite Asphalt Roof System

Table 18 - MAXIMUM SPANS (inches) - ASCE 7-10											
Roof Slope 28 to 45 Degrees - Roof Zone 3											
	Wind Speed	Ground Snow Load									
Exposure	mph	0 psf	10 psf	20 psf	30 psf	40 psf	50 psf	60 psf	70 psf	80 psf	90 psf
Category B	100	200	200	158	142	121	106	94	82	72	65
	105	200	200	158	142	121	106	94	82	72	65
	110	200	200	156	140	120	105	93	82	72	65
	120	199	183	145	131	113	100	89	81	72	65
	130	175	167	135	123	107	95	85	77	71	65
	140	155	153	126	115	101	90	81	74	68	63
	150	138	138	117	108	96	86	78	71	65	61
	160	124	124	109	101	90	81	74	68	63	58
Category C	170	111	111	102	94	85	77	71	65	60	56
	100	200	186	147	133	114	101	90	81	72	65
	105	188	176	141	128	111	98	88	79	72	65
	110	175	167	135	123	107	95	85	77	71	65
	120	152	151	124	114	100	89	81	74	68	63
	130	132	132	114	105	93	84	76	70	64	60
	140	117	117	105	97	87	79	72	66	61	57
	150	103	103	96	90	81	74	68	63	58	55
Category D	160	92	92	89	83	76	69	64	59	55	52
	170	82	82	82	77	71	65	60	56	53	50
	100	178	169	136	124	108	96	86	78	71	65
	105	164	160	130	119	104	93	83	76	69	64
	110	152	151	124	114	100	90	81	74	68	63
	120	131	131	113	105	93	84	76	70	64	60
	130	114	114	103	96	86	78	71	66	61	57
	140	100	100	94	88	80	73	67	62	58	54
150	89	89	86	81	74	68	63	58	55	51	
160	79	79	79	75	69	63	59	55	52	49	
170	71	71	71	69	64	59	55	52	49	46	

Our analysis assumes that the connections and associated hardware are installed in a workmanlike manner in accordance with the Pegasus Solar™ 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.
Structural Design Engineer