4/26/2017

Attn: Mr. Marshall Green
Quick Mount PV
2700 Mitchell Dr.
Walnut Creek, CA, 94598

RE: Quick Mount PV TRM System for use with
SnapNrack Series 100 Roof Mount System SEI Project No.: 17054.00

Dear Mr. Green

Structural Enginuity Inc. (SEI) has completed its review of the Quickmount PV Tile Replacement Mount System for use in conjunction with the SnapNrack Series 100 Roof Mount System 6063 Alloy Rails. The TRM product line includes the option of a 4.5” and 5.5” post.

The review was based on the following reference data:

- SnapNrack, Series 100 Residential Roof Mount System Installation Manual
- Norman Scheel, Structural Report and Calculations for Series 100 Roof Mount, July 6, 2013
- Construction Testing Services, Quick Mount PV Load Testing – Tile Replacement Mount [QMPV# 1-28-2016-Rev C], Job Number 11304, April 29, 2016
- Construction Testing Services, Quick Mount PV Load Testing – Tile Replacement Mount [QMPV# 1-28-2016-Rev C], Job Number 11304, January 6, 2017
- Structural Enginuity, Inc., Quick Mount PV Tile Replacement Mount, Project Number 16411.00, November 16, 2016
- Structural Enginuity, Inc., Quick Mount PV Tile Replacement Mount 5.5” Extension Post TRM Assembly Certification, Project Number 16473.00, January 11, 2017

SEI has determined that the Tile Replacement Mount is suitable for use with the SnapNrack Series 100 Roof Mount System, 6063 Alloy Rails. The approved installation and allowable loads for the Quick Mount PV TRM products is outlined in the Structural Enginuity, Inc. letters referenced above. The allowable load values are shown below, no additional load duration factors may be applied to these values.

959 Larchmont Court, Aurora, IL 60504
630-219-1997 (P)
www.structuralenginuityinc.com

Table 1: TRM Allowable Loads		
Load Direction	**Post Height**	**Allowable Load**
Uplift	4.5"	623
	5.5"	623
Lateral	4.5"	197
	5.5"	195
Compression	4.5"	659
	5.5"	659

SEI has prepared allowable rail span charts for the Series 100 Roof Mount System used in conjunction with the Quick Mount PV TRM products. These span tables serve as a quick reference for looking up maximum rail spans based on building and site conditions and follow the 2016 CBC, 2015 IBC/IRC and applicable ASCE 7-10 load cases. The tables take into account the strength of the rail system as well as the allowable tension, compression, and lateral forces of the Tile Replacement Mount. A site specific analysis is required if the site conditions or building characteristics do not meet the requirements listed in the attached tables. In all cases, the tables are meant to be used in conjunction with SnapNrack Series 100 Structural Report and Calculations and all requirements listed are still applicable for these tables including edge zones and edge distances.

Please contact our office if you have any further questions relating to this matter.

Sincerely,

Peter Martin
Engineer II
pmartin@structuralenginuityinc.com

Allan T. Myket, P.E.
President/Founder
amyket@structuralenginuityinc.com

LICENSED PROFESSIONAL ENGINEER
ALLAN MYKET
C 81477
CIVIL
STATE OF CALIFORNIA

4/26/17

Structural Enginuity Inc.

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 1A		Roof Height: 0-30 ft						Post Height: 4.5"							
		Roof Angle: 8 - 26 degrees													
Wind Load (Exposure Category B)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	11.1	12.1	13.2	14.3	15.4	16.7	17.9	19.2	20.6	22.0	23.4	26.4	29.6	33.0
	pg / ps	-7.6	-8.3	-9.1	-9.9	-10.7	-11.5	-12.4	-13.3	-14.2	-15.2	-16.1	-18.2	-20.4	-22.8
	0 / 0	126	126	126	126	126	123	117	112	107	103	99	93	87	81
	10 / 7.315	125	125	125	125	125	123	117	112	107	103	99	93	87	81
	20 / 14.63	98	98	98	98	98	98	98	98	98	98	98	93	87	81
	30 / 21.95	76	76	76	76	76	76	76	76	76	76	76	76	76	76
	40 / 29.26	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	50 / 36.58	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	60 / 43.89	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	70 / 51.21	36	36	36	36	36	36	36	36	36	36	36	36	36	36
	80 / 58.52	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	100 / 73.15	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	120 / 87.78	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 1B		Roof Height: 0-30 ft						Post Height: 5.5"							
		Roof Angle: 8 - 26 degrees													
Wind Load (Exposure Category B)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	11.1	12.1	13.2	14.3	15.4	16.7	17.9	19.2	20.6	22.0	23.4	26.4	29.6	33.0
	pg / ps	-7.6	-8.3	-9.1	-9.9	-10.7	-11.5	-12.4	-13.3	-14.2	-15.2	-16.1	-18.2	-20.4	-22.8
	0 / 0	126	126	126	126	126	123	117	112	107	103	99	93	87	81
	10 / 7.315	125	125	125	125	125	123	117	112	107	103	99	93	87	81
	20 / 14.63	98	98	98	98	98	98	98	98	98	98	98	93	87	81
	30 / 21.95	75	75	75	75	75	75	75	75	75	75	75	75	75	75
	40 / 29.26	58	58	58	58	58	58	58	58	58	58	58	58	58	58
	50 / 36.58	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	60 / 43.89	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	70 / 51.21	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	80 / 58.52	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	100 / 73.15	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	120 / 87.78	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Notes:

1. Tables are based on critical rail span for load combinations as specified in chapter 2 of the ASCE 7-10 and allowable uplift and lateral values of Quick Mount products per test reports.
2. Edge zone reductions are only required at shaded spans where reduction is 29 inches to a minimum of 32 inches.
3. Panels are assumed to be in portrait orientation with a maximum length of 66"

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 2A		Roof Height: 0-30 ft							Post Height: 4.5"						
		Roof Angle: 8 - 26 degrees													
Wind Load (Exposure Category C)															
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	126	121	115	109	104	100	95	92	88	85	82	76	72	68
	10 / 7.315	125	121	115	109	104	100	95	92	88	85	82	76	72	68
	20 / 14.63	98	98	98	98	98	98	95	92	88	85	82	76	72	68
	30 / 21.95	76	76	76	76	76	76	76	76	76	76	76	76	72	68
	40 / 29.26	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	50 / 36.58	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	60 / 43.89	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	70 / 51.21	36	36	36	36	36	36	36	36	36	36	36	36	36	36
	80 / 58.52	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	100 / 73.15	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	120 / 87.78	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 2B		Roof Height: 0-30 ft							Post Height: 5.5"						
		Roof Angle: 8 - 26 degrees													
Wind Load (Exposure Category C)															
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	126	121	115	109	104	100	95	92	88	85	82	76	72	68
	10 / 7.315	125	121	115	109	104	100	95	92	88	85	82	76	72	68
	20 / 14.63	98	98	98	98	98	98	95	92	88	85	82	76	72	68
	30 / 21.95	75	75	75	75	75	75	75	75	75	75	75	75	72	68
	40 / 29.26	58	58	58	58	58	58	58	58	58	58	58	58	58	58
	50 / 36.58	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	60 / 43.89	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	70 / 51.21	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	80 / 58.52	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	100 / 73.15	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	120 / 87.78	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Notes:

1. Tables are based on critical rail span for load combinations as specified in chapter 2 of the ASCE 7-10 and allowable uplift and lateral values of Quick Mount products per test reports.
2. Edge zone reductions are only required at shaded spans where reduction is 28 inches to a minimum of 32 inches.
3. Panels are assumed to be in portrait orientation with a maximum length of 66"

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 3A		Roof Height: 0-30 ft							Post Height: 4.5"						
		Roof Angle: 8 - 26 degrees													
Wind Load (Exposure Category D)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	18.33	20.03	21.81	23.66	25.59	27.6	29.68	31.84	34.08	36.39	38.77	43.77	49.07	54.67
	pg / ps	-12.6	-13.8	-15.0	-16.3	-17.7	-19.0	-20.5	-22.0	-23.5	-25.1	-26.8	-30.2	-33.9	-37.7
	0 / 0	115	109	104	99	94	90	86	83	80	77	74	70	65	62
	10 / 7.315	115	109	104	99	94	90	86	83	80	77	74	70	65	62
	20 / 14.63	98	98	98	98	94	90	86	83	80	77	74	70	65	62
	30 / 21.95	76	76	76	76	76	76	76	76	76	76	74	70	65	62
	40 / 29.26	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	50 / 36.58	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	60 / 43.89	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	70 / 51.21	36	36	36	36	36	36	36	36	36	36	36	36	36	36
	80 / 58.52	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	100 / 73.15	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	120 / 87.78	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 3B		Roof Height: 0-30 ft							Post Height: 5.5"						
		Roof Angle: 8 - 26 degrees													
Wind Load (Exposure Category D)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	18.3	20.0	21.8	23.7	25.6	27.6	29.7	31.8	34.1	36.4	38.8	43.8	49.1	54.7
	pg / ps	-12.6	-13.8	-15.0	-16.3	-17.7	-19.0	-20.5	-22.0	-23.5	-25.1	-26.8	-30.2	-33.9	-37.7
	0 / 0	115	109	104	99	94	90	86	83	80	77	74	70	65	62
	10 / 7.315	115	109	104	99	94	90	86	83	80	77	74	70	65	62
	20 / 14.63	98	98	98	98	94	90	86	83	80	77	74	70	65	62
	30 / 21.95	75	75	75	75	75	75	75	75	75	75	74	70	65	62
	40 / 29.26	58	58	58	58	58	58	58	58	58	58	58	58	58	58
	50 / 36.58	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	60 / 43.89	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	70 / 51.21	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	80 / 58.52	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	100 / 73.15	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	120 / 87.78	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Notes:

1. Tables are based on critical rail span for load combinations as specified in chapter 2 of the ASCE 7-10 and allowable uplift and lateral values of Quick Mount products per test reports.
2. Edge zone reductions are only required at shaded spans where reduction is 26 inches to a minimum of 32 inches.
3. Panels are assumed to be in portrait orientation with a maximum length of 66"

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 4A		Roof Height: 0-30 ft							Post Height: 4.5"						
		Roof Angle: 27 - 45 degrees													
Wind Load (Exposure Category B)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	11.06	12.09	13.16	14.28	15.45	16.66	17.91	19.22	20.56	21.96	23.4	26.41	29.61	32.99
	pg ps	-4.76	-5.2	-5.66	-6.14	-6.64	-7.16	-7.7	-8.26	-8.84	-9.44	-10.1	-11.4	-12.7	-14.2
	0 0	126	126	126	126	126	126	126	126	126	126	126	123	115	107
	10 5.39	126	126	126	126	126	126	126	126	125	124	123	120	115	107
	20 10.78	82	82	82	82	82	82	82	82	82	82	82	82	82	82
	30 16.17	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	40 21.56	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	50 26.95	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	60 32.34	33	33	33	33	33	33	33	33	33	33	33	33	33	33
	70 37.73	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	80 43.12	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	100 53.9	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	120 64.68	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 4B		Roof Height: 0-30 ft							Post Height: 5.5"						
		Roof Angle: 27 - 45 degrees													
Wind Load (Exposure Category B)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	11.1	12.1	13.2	14.3	15.4	16.7	17.9	19.2	20.6	22.0	23.4	26.4	29.6	33.0
	pg ps	-4.8	-5.2	-5.7	-6.1	-6.6	-7.2	-7.7	-8.3	-8.8	-9.4	-10.1	-11.4	-12.7	-14.2
	0 0	126	126	126	126	126	126	126	126	126	126	126	123	115	107
	10 5.39	126	126	126	126	126	126	126	126	125	124	123	120	115	107
	20 10.78	81	81	81	81	81	81	81	81	81	81	81	81	81	81
	30 16.17	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	40 21.56	47	47	47	47	47	47	47	47	47	47	47	47	47	47
	50 26.95	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	60 32.34	33	33	33	33	33	33	33	33	33	33	33	33	33	33
	70 37.73	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	80 43.12	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	100 53.9	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	120 64.68	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Notes:

1. Tables are based on critical rail span for load combinations as specified in chapter 2 of the ASCE 7-10 and allowable uplift and lateral values of Quick Mount products per test reports.
2. Edge zone reductions are only required at shaded spans where reduction is 15 inches to a minimum of 32 inches.
3. Panels are assumed to be in portrait orientation with a maximum length of 66"

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 5A		Roof Height: 0-30 ft							Post Height: 4.5"						
		Roof Angle: 27 - 45 degrees													
Wind Load (Exposure Category C)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	15.48	16.92	18.42	19.99	21.62	23.32	25.08	26.9	28.79	30.74	32.75	36.98	41.46	46.19
	pg ps	-6.66	-7.28	-7.92	-8.6	-9.3	-10	-10.8	-11.6	-12.4	-13.2	-14.1	-15.9	-17.8	-19.9
	0 0	126	126	126	126	126	126	126	122	117	112	108	100	94	88
	10 5.39	126	126	126	125	124	123	121	120	117	112	108	100	94	88
	20 10.78	82	82	82	82	82	82	82	82	82	82	82	82	82	82
	30 16.17	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	40 21.56	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	50 26.95	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	60 32.34	33	33	33	33	33	33	33	33	33	33	33	33	33	33
	70 37.73	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	80 43.12	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	100 53.9	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	120 64.68	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 5B		Roof Height: 0-30 ft							Post Height: 5.5"						
		Roof Angle: 27 - 45 degrees													
Wind Load (Exposure Category C)															
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	-6.7	-7.3	-7.9	-8.6	-9.3	-10.0	-10.8	-11.6	-12.4	-13.2	-14.1	-15.9	-17.8	-19.9
	0 0	126	126	126	126	126	126	126	122	117	112	108	100	94	88
	10 5.39	126	126	126	125	124	123	121	120	117	112	108	100	94	88
	20 10.78	81	81	81	81	81	81	81	81	81	81	81	81	81	81
	30 16.17	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	40 21.56	47	47	47	47	47	47	47	47	47	47	47	47	47	47
	50 26.95	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	60 32.34	33	33	33	33	33	33	33	33	33	33	33	33	33	33
	70 37.73	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	80 43.12	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	100 53.9	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	120 64.68	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Notes:

1. Tables are based on critical rail span for load combinations as specified in chapter 2 of the ASCE 7-10 and allowable uplift and lateral values of Quick Mount products per test reports.
2. Edge zone reductions are only required at shaded spans where reduction is 15 inches to a minimum of 32 inches.
3. Panels are assumed to be in portrait orientation with a maximum length of 66"

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 6A		Roof Height: 0-30 ft							Post Height: 4.5"						
		Roof Angle: 27 - 45 degrees													
Wind Load (Exposure Category D)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	18.33	20.03	21.81	23.66	25.59	27.6	29.68	31.84	34.08	36.39	38.77	43.77	49.07	54.67
	pg ps	-7.88	-8.61	-9.38	-10.2	-11	-11.9	-12.8	-13.7	-14.7	-15.6	-16.7	-18.8	-21.1	-23.5
	0 0	126	126	126	126	126	120	115	110	105	101	97	91	85	80
	10 5.39	126	125	124	122	121	119	115	110	105	101	97	91	85	80
	20 10.78	82	82	82	82	82	82	82	82	82	82	82	82	82	80
	30 16.17	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	40 21.56	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	50 26.95	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	60 32.34	33	33	33	33	33	33	33	33	33	33	33	33	33	33
	70 37.73	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	80 43.12	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	100 53.9	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	120 64.68	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Rail Spans for SnapNrack Series 100 Roof Mount for use with TRM Products

Table 6B		Roof Height: 0-30 ft							Post Height: 5.5"						
		Roof Angle: 27 - 45 degrees													
Wind Load (Exposure Category D)															
Ground Snow Load (psf)	vult	110	115	120	125	130	135	140	145	150	155	160	170	180	190
	qh	18.3	20.0	21.8	23.7	25.6	27.6	29.7	31.8	34.1	36.4	38.8	43.8	49.1	54.7
	pg ps	-7.9	-8.6	-9.4	-10.2	-11.0	-11.9	-12.8	-13.7	-14.7	-15.6	-16.7	-18.8	-21.1	-23.5
	0 0	126	126	126	126	126	120	115	110	105	101	97	91	85	80
	10 5.39	126	125	124	122	121	119	115	110	105	101	97	91	85	80
	20 10.78	81	81	81	81	81	81	81	81	81	81	81	81	81	80
	30 16.17	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	40 21.56	47	47	47	47	47	47	47	47	47	47	47	47	47	47
	50 26.95	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	60 32.34	33	33	33	33	33	33	33	33	33	33	33	33	33	33
	70 37.73	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	80 43.12	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	100 53.9	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	120 64.68	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Notes:

1. Tables are based on critical rail span for load combinations as specified in chapter 2 of the ASCE 7-10 and allowable uplift and lateral values of Quick Mount products per test reports.
2. Edge zone reductions are only required at shaded spans where reduction is 16 inches to a minimum of 32 inches.
3. Panels are assumed to be in portrait orientation with a maximum length of 66"