



March 8, 2017

Mounting Systems, Inc.
820 Riverside Pkwy
Sacramento, California, 95606
TEL: (855) 731-9996
FAX: (916) 287-2269

Attn.: Mounting Systems, Inc. - Engineering Department

Re: Engineering Certification for the Mounting Systems, Inc. 5/40 Rail.
Project No. 17-00836

PZSE, Inc.-Structural Engineers has reviewed Mounting Systems, Inc. 5/40 Rail span chart. All information, data and analysis contained within the Mounting Systems, Inc. rail span charts are based on, and comply with Mounting Systems, Inc.'s *Technical Data* and the following codes:

1. Minimum Design Loads for Buildings and other Structures, ASCE/SEI 7-10
2. 2015 International Building Codes, by International Code Council, Inc.
3. 2016 California Building Code, by California Building Standards Commission
4. 2015 Aluminum Design Manual, by The Aluminum Association
5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES

Following are typical specifications for the connections to meet the above code requirements:

Attachment Spacing: The maximum attachment spacing shall not exceed the 5/40 Rail span chart

Cantilever: Maximum cantilever length is $L/3$, where "L" is the span noted in the Span Chart Tables.

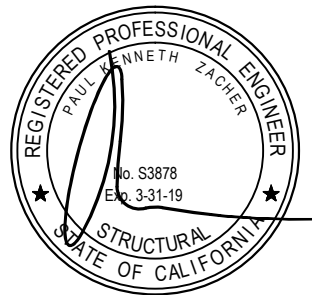
Clearance: 2" to 10" clear from top of roof to bottom of PV panel.

Roof/Roof Connection: Shall be calculated by the building Engineer of Record.

This letter is to certify that the loading criteria and design basis for the Mounting Systems, Inc. 5/40 span charts within the attached tables are in compliance with the above codes.

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

Prepared by:
PZSE, Inc. – Structural Engineers
Roseville, CA



Mounting Systems, Inc. - 5/40 Rail

Exposure B - Zone 1 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
B	0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.0
	10	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.0
	20	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.0	5.0
	30	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5
	40	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	50	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	60	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	70	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	80	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Exposure C - Zone 1 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
C	0	6.0	6.0	6.0	6.0	5.5	5.0	4.5	4.5	4.0
	10	6.0	6.0	6.0	6.0	5.5	5.0	4.5	4.5	4.0
	20	6.0	6.0	5.5	5.5	5.0	5.0	4.5	4.5	4.0
	30	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.0
	40	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0
	50	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	60	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5
	70	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	80	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0

Exposure D - Zone 1 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
D	0	6.0	6.0	6.0	5.5	5.0	4.5	4.0	4.0	4.0
	10	6.0	6.0	6.0	5.5	5.0	4.5	4.0	4.0	4.0
	20	6.0	5.5	5.5	5.0	5.0	4.5	4.0	4.0	4.0
	30	5.0	5.0	5.0	5.0	4.5	4.5	4.0	4.0	4.0
	40	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0
	50	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5
	60	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
	70	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	80	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0

Notes:

- The table above ONLY includes Mounting Systems, Inc. 5/40 Rail capacity check. It does not include roof capacity check.
- Wind Risk Category II per ASCE 7-10
- Topographic factor, k_{zt} is 1.0
- Maximum mean roof height is 30 ft.
- Roof pitch is between 7 degree and 27 degree
- Maximum solar panel weight is 60 lbs
- Height of solar panel is between 2" and 10" to roof
- Deflection criteria of L/60 per AC428 Section 4.3
- The wind speeds above are LRFD values
- The span length applies to a seismic design category E or less
- Maximum cantilever is L/3
- Spans indicated above are in units of feet
- The maximum panel length is 77 inches.
- Minimum (2) 5/40 Rails per panel in portrait orientation
- Mounting Systems, Inc. strongly recommends a maximum span of 6 feet, but in any case, not to exceed the maximum span indicated on the chart

Mounting Systems, Inc. - 5/40 Rail

Exposure B - Zone 2 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
B	0	6.0	6.0	5.5	5.0	4.5	4.0	4.0	4.0	3.5
	10	6.0	6.0	5.5	5.0	4.5	4.0	4.0	4.0	3.5
	20	6.0	6.0	5.5	5.0	4.5	4.0	4.0	4.0	3.5
	30	5.0	5.0	5.0	5.0	4.5	4.0	4.0	4.0	3.5
	40	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	3.5
	50	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5
	60	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5
	70	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	80	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Exposure C - Zone 2 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
C	0	6.0	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0
	10	5.5	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0
	20	5.5	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0
	30	5.0	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0
	40	4.5	4.5	4.5	4.0	4.0	3.5	3.5	3.0	3.0
	50	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.0	3.0
	60	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.0	3.0
	70	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0
	80	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0

Exposure D - Zone 2 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
D	0	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	10	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	20	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	30	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	40	4.5	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	50	4.0	4.0	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	60	4.0	4.0	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	70	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0
	80	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0

Notes:

- The table above ONLY includes Mounting Systems, Inc. 5/40 Rail capacity check. It does not include roof capacity check.
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- Topographic factor, k_{zt} is 1.0
- Maximum mean roof height is 30 ft.
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- The wind speeds above are LRFD values
- The span length applies to a seismic design category E or less
- Maximum cantilever is L/3
- Spans indicated above are in units of feet
- The maximum panel length is 77 inches.
- Minimum (2) 5/40 Rails per panel in portrait orientation
- Mounting Systems, Inc. strongly recommends a maximum span of 6 feet, but in any case, not to exceed the maximum span indicated on the chart

Mounting Systems, Inc. - 5/40 Rail

Exposure B - Zone 3 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
B	0	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	10	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	20	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	30	5.0	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	40	4.5	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	50	4.0	4.0	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	60	4.0	4.0	4.0	4.0	3.5	3.5	3.0	3.0	3.0
	70	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0
	80	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0

Exposure C - Zone 3 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
C	0	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	10	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	20	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	30	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	40	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	50	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	60	4.0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	70	3.5	3.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5
	80	3.5	3.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5

Exposure D - Zone 3 Span Chart (ft)										
Exposure Category	Ground Snow Load (psf)	Wind Speed (mph)								
		110	120	130	140	150	160	170	180	190
D	0	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	10	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	20	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	30	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	40	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	50	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	60	4.0	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	70	3.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0
	80	3.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.0

Notes:

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