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March 16, 2016

Unirac, Inc.
1411 Broadway Blvd. NE
Albuquerque, NM 87102

To: Building Department or Others:

Re: Engineering Certification for the Unirac RM Ballasted Photovoltaic Panel Support System for Minnesota Design Certification

Dear Sir:

This letter certifies that the Unirac Roof Mounted Ballasted Photovoltaic Panel System and design methodology are in compliance with the below Reference Documents:

- Code Compliance:
International Building Code, 2012 Edition
ASCE/SEI 7-10 "Minimum Design Codes for Buildings and Other Structures"
- Other:
Aluminum Design Manual 2010 Ed.
RWDI Wind Pressure Study Report #1300856

To determine the required ballast per module, the appropriate wind speed and Exposure category shall be determined as prescribed by 2015 Minnesota Building Code and local jurisdiction requirements. The Minnesota design requires that wind loading be determined based upon International Building Code 2012 and ASCE 7-10. Unirac's "RM Design & Engineering Guide" utilizes ASCE 7-10 for which Unirac Tables for different design conditions such as wind speed, Exposure B and C, building height and whether or not there is the presence of a parapet to determine the required ballast weight per various groupings of modules.

Unirac rules for application of the "RM Design & Engineering Guide" and "Rules for Array Geometry" are as follows:

- a) Minimum clearance to roof edge: 3 feet minimum set-back.
- b) Roof slope: low slope (< 1:10)
- c) Module size: 39" approximate width and length 77" +/-20%
- d) Building Height 15' to 60'

- e) Clearance for roof objects: the height of the obstruction should be the clearance distance from the array
- f) Roof objects: roof obstructions larger than 60" x 60" could change the ballasting recommendations.
- g) Design is based upon Importance factor for both wind and seismic equal to 1.0

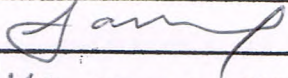
By this letter, I certify that the Unirac's RM Design & Engineering Guide will meet the requirements of the 2015 Minnesota Building Code adopted. Others should evaluate the building structure for structural adequacy to ensure its adequacy to support the PV mounting system for all applied loadings per the building code.

Sincerely,

James A. Marx, Jr.
Professional Engineer
MN License Number 21662

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Print Name: JAMES A. MARX

Signature: 

Date 3/16/16 License # 21662