December 6, 2016

Unirac
1411 Broadway Boulevard NE
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Attn.: Engineering Department,

Re: Engineering Certification for the Unirac RM5 Roof Mounted Ballasted Photovoltaic Panel Support System.

The Unirac RM5 Roof Mounted Ballasted Photovoltaic Panel Support System is a proprietary framed ballasted assembly which supports Photovoltaic panels. The ballast frames hold the PV panels and are ballasted with concrete blocks as required for the wind loads. The wind uplift loads are resisted directly by the ballast. Lateral forces, both wind and seismic, are resisted by friction between the ballast and the roof surface. For wind forces, the system is designed for no lateral or vertical displacement of the array. For seismic forces, the system is designed per SEAOC PV1-2012 requirements for lateral movement/displacement.

The ballasting requirements are determined using the Unirac online "U-Builder RM5" Design Assistant tool. The Design Assistant covers a wide range of system configurations and loading and allows the user to customize the input to match the specific project conditions.

We have reviewed the Unirac RM5 Roof Mounted Ballasted Photovoltaic Panel Support System, the RDWI wind tunnel test results and the Unirac ballasted system design methodology and have determined that the Unirac RM5 ballasted system design methodology is a rational approach and is in compliance with the structural requirements of the following Reference Documents:

Codes: ASCE/SEI 7-05 and ASCE/SEI 7-10 Minimum Design Loads for Buildings and other Structures
International Building Code, 2009, 2012, & 2015 Editions

Other: Aluminum Design Manual, 2010 Edition
RWDI Wind Pressure Study Report #1600097
SEAOC PV1-2012 Report – Structural Seismic Requirements and Commentary for Rooftop Solar PV Arrays
SEAOC PV2-2012 Report - Wind Design for Low-Profile Solar Photovoltaic Arrays on Flat Roofs
Terrapin Testing #TT516003-ASTM G115 Coefficient of Friction Testing Report

This letter certifies that the Unirac RM5 Roof Mounted Ballasted Photovoltaic Panel Support System and the Unirac online "U-Builder RM5" Design Assistant tool are in compliance with the above Reference Documents.

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

LICENSED STRUCTURAL ENGINEER
PAUL K. ZACHER
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EXP. 11/30/2018
STATE OF ILLINOIS

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