

January 2, 2020

**PowerHome Solar**  
 919 N. Main St  
 Mooresville, NC 28115

**RE: Blakey Residence**  
**15024 Ashton Road, Detroit, MI 48223**  
**Client Project #: 15024BLAK**  
**PFE Project #: 201002**

On behalf of PowerHome Solar, Penn Fusion Engineering LLC (PFE) performed a structural analysis of the roof at the above referenced location. The purpose of our analysis was to determine if the existing roof system is structurally sufficient to support the new photovoltaic modules in addition to the code required design loads. Information used for this analysis was determined by a site survey performed by a representative of PFE and is isolated only to the areas where the modules are intended to be placed. If any discrepancies are found by the contractor during installation, please contact PFE.

**System Specifications:**

 Panel Specs: (22) Silfab Solar – SLA-M  
 Racking System: Quick Mount PV – QRail Light

The modules are to be located on the following roof planes:

Mounting Plane	Rafter Size	Rafter Spacing	Horizontal Span	Collar Ties	Collar Tie Spacing	Sheathing	Shingle Type	Number of Shingle Layers	Ceiling Profile
1	2x6	16"	13ft. 11in.	N/A	0"	CDX 1/2"	Asphalt Shingles	1	Flat
2	2x6	16"	12ft. 0in.	N/A	0"	CDX 1/2"	Asphalt Shingles	1	Flat

The roof design has been analyzed in accordance with the 2015 Michigan Residential Code with design loads as follows:

 Ground Snow (Pg): 20 psf  
 Wind Speed (V): 115 mph

**Mounting Plane 1**

The calculations for these structural members are attached. It has been determined by this office that the roof, as specified above, is adequate to support the new PV modules in addition to the code required design loading.

Attach the module rail brackets to the roof with 5/16" lag bolts at 48 on center maximum with staggered penetration such that load is distributed evenly among roof members. Provide a minimum of 2" of penetration into the wood members.

**Mounting Plane 2**

The calculations for these structural members are attached. It has been determined by this office that the roof, as specified above, is adequate to support the new PV modules in addition to the code required design loading.

Attach the module rail brackets to the roof with 5/16" lag bolts at 48 on center maximum with staggered penetration such that load is distributed evenly among roof members. Provide a minimum of 2" of penetration into the wood members.

This office has determined that the installation of the PV System as specified above will meet the structural requirements of the 2015 Michigan Residential Code and ASCE7-10 when installed in accordance with the manufacture's instructions.

If you have any questions regarding this analysis, please feel free to contact us.

 Best Regards,  
**Penn Fusion Engineering LLC**

 Andrew D. Leone, P.E.  
 Principal
