

July 20, 2018

PowerHome Solar  
919 N. Main St  
Mooresville, NC 28115

RE: Northgrave Residence  
2424 Delmar Ct, Fuquay Varina, NC 27526  
Client Project #: 2424NORT  
PFE Project #: 183104

On behalf of PowerHome Solar, Penn Fusion Engineering LLC (PFE) performed a structural analysis of the roof design at the above referenced location. The purpose of our analysis was to determine if the existing design of the roof system is structurally sufficient to support the new photovoltaic modules in addition to the code required design loads. Our analysis is based on the information provided by PowerHome Solar and is isolated only to the areas where the modules are intended to be placed.

**System Specifications:**

Total System Size: 4.72 kW/DC  
Panel Specs: (16) Mission Solar – MSE295SQ5T  
Inverter Specs: (16) Enphase – IQ6+  
Racking System: Iron Ridge – Flush Mount

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

Mounting Plane	Rafter Size	Rafter Spacing	Horizontal Span	Collar Ties	Collar Tie Spacing	Sheathing	Shingle Type	Number of Shingle Layers	Ceiling Profile
1	Truss	24"	40ft. 11in.	N/A	0"	CDX 1/2"	Asphalt Shingles	1	Flat

The roof design has been analyzed in accordance with the 2012 North Carolina Residential Code with design loads as follows:

Ground Snow (Pg): 15 psf  
Wind Speed (V): 95 mph

**Mounting Plane 1**

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. Provide a minimum of 2" of penetration into the wood members.

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

Best Regards,  
Penn Fusion Engineering LLC  
Firm License No. P-1848

Andrew D. Leone, P.E.  
Principal

