MODEL ENERGY, PLLC
MODELENERGY.COM
919-274-9905
300 FAYETTEVILLE ST., #1430
RALEIGH, NC 27602

Customer: LifeLinkMedical Group
Installer: 8M Solar
Subject: PV System Structural Compliance
Date: 10/27/2023

To whom it may concern:

Model Energy, PLLC has reviewed the installation details of the proposed PV system that is to be installed by 8M Solar at 901 Denim Dr, Erwin, NC 28339. The review was limited to the structural elements involved in the construction and not the electrical, mechanical, etc. The conditions of the existing structure have been reviewed and validated by Model Energy, PLLC. The Installation design and corresponding calculations are informed by the 2018 North Carolina Building Code and comply with the 2018 NCBC.

System/Structural Information

Wind Speed: 119 mph	Exposure Category: B
Dead Load: 10 psf	Live Load: 20 psf Snow Load: 15 psf,
Mean Roof Height: 25 ft.	Roof Pitch: 22.5°,
Truss Size & Spacing, and Span:	2" X 6"@ 24" O.C., RA & RC:18', RB:30'.
Roof Construction:	Trusses, PLYWOOD, Asphalt Shingles,
Wood Type and Grade:	Southern Pine, #2,
Solar Module, Make, Dimens., and Weight:	Q.PEAK DUO XL-G10.3/BFG 480W, 41.1" x 87.2", 64.2lbs.
Racking System Make and Weight:	Pegasus PSR-B84 (Black), 1 lbs. per foot.
Roof Attachment Make:	Pegasus Comp Mount 5/16" x 4 ½" SS Lag Round-Point Setscrews.
Roof Attachment Weight:	0.17 lb. per foot.

PV System Dead Load: (Panel + Racking weight) / PV System Area

RA: (11 modules x 64.2lbs./module + 166 ft. of racking x 1.17 lb./ft) / (11 modules x41.1" x87.2") = 3.28 psf
RB: (59 modules x 64.2lbs./module + 479 ft. of racking x 1.17 lb./ft) / (59 modules x41.1" x87.2") = 2.95 psf
RC: (06 modules x 64.2lbs./module + 47 ft. of racking x 1.17 lb./ft) / (06 modules x41.1" x87.2") = 2.94 psf

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Additional Dead Load

The existing roof structure is comprised of 2" X 6" Trusses. The effective span of these members is RA, RC:18', RB:30'. On top of this is 5/8" thick PLYWOOD, with tar paper, and Asphalt Shingles. The estimated dead load of the existing materials is 3.20 psf (1.90 psf for PLYWOOD + 1.30 psf for Asphalt Shingles). The existing structure has been sized and spaced for supporting a dead load up to 10.0 psf. The additional dead load of the PV system and the existing roof elements gives a total max. dead load of 6.48 psf which can be adequately supported by the existing roof structure.

Wind Load and Roof Attachments

Based on the wind loading method outlined in ASCE 7-10 and the conditions/materials used in this installation, the following roof attachment layout is required for properly securing the PV system to the roof structure:

1. The attachments on the end of each rail shall be within 16" of the end of the rail.
2. Interior attachments within three feet of the roof edge and ridge, "Zone 3", may be spaced apart no more than 24" for landscape modules and do not place portrait modules on this zone.
3. Interior attachments within three feet of the roof edge or ridge, "Zone 2", may be spaced apart no more than 48" for landscape modules and 24" for portrait modules.
4. Interior attachments further than within three feet of the roof edge and ridge, "Zone 1", may be spaced apart no more than 72" for landscape modules and 48" for portrait modules.
5. Staggering the attachments of the top and bottom rails is preferable, but not required.
6. Pegasus Comp Mount 5/16" x 4 ½" SS Lag Round-Point Setscrews shall secure each attachment foot to the roofing and sub-roofing materials. Follow the manufacturer's instructions to ensure proper fastening.

Thank you,

Andrew King, PE

Andrew W King Digitally signed by Andrew W King Date: 2023.10.30 15:55:43 -04'00'