March 15, 2023

Suntuity Solar

2137 Route 35

Holmdel, NJ 07733

Re: Engineering Services

Gray Residence

3717 Redwood Drive, Holiday FL

11.200 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

1. ***Site Assessment Information***
2. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
3. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.
4. ***Description of Structure:***

***Roof Framing:*** Prefabricated wood trusses at 24” on center. All truss members are constructed of 2x4 dimensional lumber.

***Roof Material:*** Composite Asphalt Shingles

***Roof Slopes:*** 14 degrees

***Attic Access:*** Accessible

***Foundation:*** Permanent

1. ***Loading Criteria Used***

* **Dead Load**
  + Existing Roofing and framing = 7 psf
  + New Solar Panels and Racking = 3 psf
  + TOTAL = 10 PSF
* **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
* **Ground Snow Load** = 0 psf
* **Wind Load** based on ASCE 7-16
  + Ultimate Wind Speed = 140 mph (based on Risk Category II)
  + Exposure Category B

*Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the FBC 2020, 7th Edition, including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.*

1. ***Solar Panel Anchorage***
2. Roof 1
   * 1. The solar panels shall be mounted in accordance with the most recent Ecofasten installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
     2. The maximum allowable withdrawal force for a 5/16” lag screw is 229 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 2½”, the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using one 5/16” diameter lag screw with a minimum of 2½” embedment will be adequate and will include a sufficient factor of safety.
3. Roof 2
   * 1. The solar panels shall be mounted in accordance with the most recent Ecofasten Deck Mount installation manual. If during solar p anel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
     2. The maximum allowable withdrawal for a 5/16” wood screw in ½” plywood/OSB board is 55 lbs per screw (per APA technical note E830d). Connection on the roof is utilizing eight (8) 5/16” wood screws into the existing decking to resist uplift forces. Contractor to verify installation to be performed in accordance with the manufacturer’s recommendations. Based on eight (8) 5/16” wood screws into ½” sheathing, 440 lbs of uplift resistance is provided per attachment.
4. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48” on center.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the FBC 2020, 7th Edition, current industry standards and practice, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.



Very truly yours,

Text

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Scott E. Wyssling, PE

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Date Signed 3/15/23