

BARUN CORP

May 31, 2023

RE: CERTIFICATION LETTER

Project Address: BRYAN EVANS
110 EAST I STREET
ERWIN, NC 28339

Design Criteria:

- Applicable Codes = 2018 NCSBC, 2015 IEBC/IBC, 2015 IRC, ASCE 7-10 and 2015 NDS
- Risk Category = II
- Wind Speed = 130 mph, Exposure Category C, Partially/Fully Enclosed Method
- Ground Snow Load = 15 psf
- Roof 1&2: 2 x 4 @ 24" OC, Roof DL = 8 psf, Roof LL/SL = 14 psf (Non-PV), Roof LL/SL = 5.8 psf (PV)

To Whom It May Concern,

A structural evaluation of loading was conducted for the above address based on the design criteria listed above.

Existing roof structural framing has been reviewed for additional loading due to installation of Solar PV System on the roof. The structural review applies to the sections of roof that is directly supporting the Solar PV System.

Based on this evaluation, I certify that the alteration to the existing structure by installation of the Solar PV System meets the prescriptive compliance requirements of the applicable existing building and/or new building provisions adopted/referenced above.

Additionally, the Solar PV System assembly (including attachment hardware) has been reviewed to be in accordance with the manufacturer's specifications and to meet and/or exceed the requirements set forth by the referenced codes.

Sincerely,



This document is the property of Barun Corp and cannot be reproduced without prior consent. It is site specific and shall not be transferred to any other property, property owner, person(s), or entity. This document may include an expression of professional opinion by the engineer of record, which is based on his or her best knowledge, information provided by others, and belief. Other professionals may have different opinions. Barun Corp reserves the right to amend and/or supplement this document in the event additional information be uncovered or made available.

| MOUNTING PLANE STRUCTURAL EVALUATION | | | |
|---|-------------------|---------------|---------------------------|
| MOUNTING PLANE | ROOF PITCH | RESULT | GOVERNING ANALYSIS |
| Roof 1&2 | 40° | OK | IEBC IMPACT CHECK |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Limits of Scope of Work and Liability:

The existing structure has been reviewed based on the assumption that it has been originally designed and constructed per appropriate codes. The structural analysis of the subject property is based on the provided site survey data. The calculations produced for this structure's assessment are only for the roof framing supporting the proposed PV installation referenced in the stamped planset and were made according to generally recognized structural analysis standards and procedures. All PV modules, racking and attachment components shall be designed and installed per manufacturer's approved guidelines and specifications. These plans are not stamped for water leakage or existing damage to the structural component that was not accessed during the site survey. Prior to commencement of work, the PV system installer should verify that the existing roof and connections are in suitable condition and inspect framing noted on the certification letter and inform the Engineer of Record of any discrepancies prior to installation. The installer should also check for any damages such as water damage, cracked framing, etc. and inform the Engineer of Record of existing deficiencies which are unknown and/or were not observable during the time of survey and have not been included in this scope of work. Any change in the scope of the work shall not be accepted unless such change, addition, or deletion is approved in advance and in writing by the Engineer of Record.

| | | |
|---|-------------------------|--|
| BARUN CORP | LOAD CALCULATION | |
| | Roof 1&2 | |
| BRYAN EVANS, 110 EAST I STREET, ERWIN, NC 28339 | | |

| PV PANELS DEAD LOAD (PV-DL) | |
|------------------------------------|-------------------------|
| PV Panels Weight | = 2.50 psf |
| Hardware Assembly Weight | = 0.50 psf |
| Total PV Panels Weight | PV-DL = 3.00 psf |

| ROOF DEAD LOAD (R-DL) | | | |
|----------------------------------|------------------------|------------|------------------------|
| Existing Roofing Material Weight | Composite Shingle Roof | 1 Layer(s) | = 2.50 psf |
| Underlayment Weight | | | = 0.50 psf |
| Wood Paneling Weight | | | = 2.50 psf |
| Framing Weight | 2 x 4 @ 24 in. O.C. | | = 0.73 psf |
| No Vaulted Ceiling | | | = 0.00 psf |
| Miscellaneous | | | = 1.50 psf |
| Total Roof Dead Load | | | R-DL = 7.70 psf |

| REDUCED ROOF LIVE LOAD (Lr) | |
|--|--------------------------|
| Roof Live Load | Lo = 20.00 psf |
| Member Tributary Area | At < 200 ft ² |
| Roof 1&2 Pitch | 40° or 10/12 |
| Tributary Area Reduction Factor | R1 = 1.00 |
| Roof Slope Reduction Factor | R2 = 0.70 |
| Reduced Roof Live Load, Lr = Lo (R1) (R2) | Lr = 14.00 psf |

| SNOW LOAD | |
|-----------------------------|-----------------------|
| Ground Snow Load | pg = 15.00 psf |
| Effective Roof Slope | 40° |
| Snow Importance Factor | Is = 1.00 |
| Snow Exposure Factor | Ce = 1.00 |
| Snow Thermal Factor | Ct = 1.10 |
| Minimum Flat Roof Snow Load | pf-min = 0.00 psf |
| Flat Roof Snow Load | pf = 11.60 psf |

| SLOPED ROOF SNOW LOAD ON ROOF (Non-Slippery Surfaces) | |
|--|----------------------------|
| Roof Slope Factor | Cs-roof = 0.92 |
| Sloped Roof Snow Load on Roof | ps-roof = 10.70 psf |

| SLOPED ROOF SNOW LOAD ON PV PANELS (Unobstructed Slippery Surfaces) | |
|--|-------------------------|
| Roof Slope Factor | Cs-PV = 0.50 |
| Sloped Roof Snow Load on PV Panels | ps-PV = 5.80 psf |

| | | |
|---|--------------------------|--|
| BARUN CORP | IEBC IMPACT CHECK | |
| | Roof 1&2 | |
| BRYAN EVANS, 110 EAST I STREET, ERWIN, NC 28339 | | |

| | EXISTING | WITH PV PANELS | |
|-----------------------|-----------------|-----------------------|-----|
| Roof Dead Load (DL) = | 7.70 | 10.70 | psf |
| Roof Live Load (Lr) = | 14.00 | 0.00 | psf |
| Roof Snow Load (SL) = | 10.70 | 5.80 | psf |

| | EXISTING | WITH PV PANELS | |
|------------------------|-----------------|-----------------------|-----|
| (DL + Lr)/Cd = | 17.36 | 11.89 | psf |
| (DL + SL)/Cd = | 16.00 | 14.35 | psf |
| Maximum Gravity Load = | 17.36 | 14.35 | psf |

Load Increase (%) = **OK**

The requirements of section 807.4 of 2015 IEBC are met and the structure is permitted to remain unaltered.