BARUN CORP

October 14, 2021

RE: CERTIFICATION LETTER

Project Address: KATHLEEN FLOCKE Residence
256 ROLLING PINES DRIVE,
SPRING LAKE, NC 28390

Design Criteria:

- Applicable Codes = 2018 NCSBC, 2018 NCSRC, 2015 IEBC/IBC, 2015 IRC, ASCE 7-10, and 2015 NDS
- Risk Category = II
- Wind Speed = 118 mph, Exposure Category B, Partially/Fully Enclosed Method
- Ground Snow Load = 10 psf
- Roof 1&2 : 2 x 8 @ 16" OC, Roof DL = 8 psf, Roof LL/SL = 14 psf (Non-PV), Roof LL/SL = 3.9 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 PV Solar 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 PV system meets the prescriptive compliance requirements of the applicable existing building and/or new building provisions adopted/referenced above.

Additionally, the PV module 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,

Xiaojian Xie, P.E.

Xiaojian Xie Digitally signed by Xiaojian Xie
Date: 2021.10.15 10:31:08 -04'00'

BARUN CORP	RESULTS SUMMARY
KATHLEEN FLOCKE RESIDENCE, 256 ROLLING PINES DRIVE,, SPRING LAKE, NC 28390	

MOUNTING PLANE STRUCTURAL EVALUATION (BASED ON IEBC 5% IMPACT CHECK)		
ROOF	**ROOF PITCH (deg.)**	**RESULT**
Roof 1&2	40°	**OK**

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LOAD CALCULATION

Roof 1&2

KATHLEEN FLOCKE RESIDENCE, 256 ROLLING PINES DRIVE,, SPRING LAKE, NC 28390

PV SYSTEM DEAD LOAD (PV-DL)		
PV module weight		2.5 psf
Hardware assembly weight		0.5 psf
	PV-DL	**3.00 psf**

ROOF DEAD LOAD (R-DL)	MATERIAL		
Existing Roofing Material	Comp Roof	1 layers	2.5 psf
Underlayment			0.5 psf
Plywood Sheathing			1.5 psf
Framing Weight	2 x 8	@ 16 in. O.C.	2.34 psf
Vaulted ceiling		No	0 psf
Miscellaneous			1.5 psf
Total Roof Dead Load		**R-DL**	**8.34 psf**

REDUCED ROOF LIVE LOAD (Lr)	EXPRESSION	VALUE	
Roof Live Load	L_o	20.0 psf	
Member Tributary Area	A_t	< 200 sf	
Roof 1&2 Pitch		10/12	*or 40°*
Trubutary Area Reduction	R_1	1	
Slope Roof Reduction	R_2	0.7	
Reduced Roof Live Load	**$Lr = L_o (R_1) (R_2)$**	**14.00 psf**	

SNOW LOAD	VALUE	
Ground Snow Load	p_g	10
Effective Roof Slope		40°
Snow Importance Factor	I_s	1.0
Snow Exposure Factor	C_e	1.0
Snow Thermal Factor	C_t	1.1
Minimum Flat Roof Snow Load	$p_{f\text{-}min}$	10
Flat Roof Snow Load	**p_f**	**7.70**

SLOPED ROOF SNOW LOAD ON ROOF	(All other surfaces)	
Roof Slope Factor	$C_{s\text{-}roof}$	0.92
	$p_{s\text{-}roof}$	**7.10**

SLOPED ROOF SNOW LOAD ON PV PANEL	(Unobstructed slippery surfaces)	
Roof Slope Factor	$C_{s\text{-}pv}$	0.50
	$p_{s\text{-}pv}$	**3.90**

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IEBC 5% IMPACT CHECK

Roof 1&2

KATHLEEN FLOCKE RESIDENCE, 256 ROLLING PINES DRIVE,, SPRING LAKE, NC 28390

	EXISTING	WITH PV PANEL	
Roof Dead Load (DL) =	8.34	11.34	psf
Roof Live Load (Lr) =	14.00	0.00	psf
Roof Snow Load (SL) =	7.10	3.90	psf

	EXISTING	WITH PV PANEL	
(DL + Lr) / Cd =	17.88	12.60	psf
(DL + SL) / Cd =	13.43	13.26	psf
Maximum Gravity Load =	17.88	13.26	psf

Load Increase (%) =	-25.84%	OK
IEBC Provision :	2015	

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