

RE: Structural Certification for Installation of Residential Solar ANDY BUERGO:241 NW POMPANO CT, LAKE CITY, FL 32055

Attn: To Whom It May Concern

This Letter is for the existing roof framing which supports the new PV modules as well as the attachment of the PV system to existing roof framing. From the field observation report, the roof is made of Stone-Coated Steel roofing over 1/2 inch plywood supported by 2X4 Trusses at 24 inches .The slope of the roof was approximated to be 30 degrees.

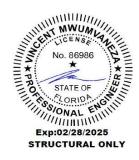
After review of the field observation data and based on our structural capacity calculation, the existing roof framing has been determined to be adequate to support the imposed loads without structural upgrades. Contractor shall verify that existing framing is consistent with the described above before install. Should they find any discrepancies, a written approval from SEOR is mandatory before proceeding with install. Capacity calculations were done in accordance with applicable building codes.

<u>Code</u>	2020 Florida Buildii	ng Code (ASCE 7-16	5)		
Risk category		II	Wind Load	(component	and Cladding)
Roof Dead Load	Dr	10 psf		V	120 mph
PV Dead Load	DPV	3 psf		Exposure	В
Roof Live Load	Lr	20 psf			
Ground Snow	S	0 psf			

If you have any questions on the above, please do not hesitate to call.

Sincerely,

Vincent Mwumvaneza, P.E EV Engineering LLC



This item has been digitally signed and sealed by Vincent Mwumvaneza on the date adjacent to the seal.

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Structural Letter for PV Installation

Date: 12/20/2023

Job Address: 241 NW POMPANO CT

LAKE CITY, FL 32055

Job Name: ANDY BUERGO
Job Number: 122023AB

Scope of Work

This Letter is for the existing roof framing which supports the new PV modules as well as the attachment of the PV system to existing roof framing. All PV mounting equipment shall be designed and installed per manufacturer's approved installation specifications.

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Engineering Calculations Summary

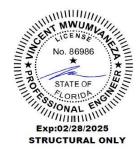
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Wind Load	(component and Cladding)				
	V	120	mph		
	Exposure	В			

References

NDS for Wood Construction

Sincerely,

Vincent Mwumvaneza, P.E EV Engineering LLC



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Wind Load Cont.

Risk Category =	II	
V=	120	mph ASCE 7-16 Figure 26.5-1B
Exposure =	В	
K _{Zt} =	1.0	ASCE 7-16 Sec 26.8.2
K _Z =	0.57	ASCE 7-16 Table 26.10-1
$K_d =$	0.85	ASCE 7-16 Table 26.6-1
K _e =	0.99	ASCE 7-16 Table 26.9-1
$q_h = 0.00256K_zK_{zt}K_dK_eV^2 =$	17.77	psf
Pitch =	30.0	Degrees
γ _E =	1.0	
γ_a =	0.6	considering 1 module

<u>Upli</u>	ft (W)	Zone(1,2e,2r)	Zone(2n)	Zone(3r)	Zone(3e)	
Fig. 30-3-2	GC _p =	-1.1	-1.1	-1.45	-1.8	
Eq. 29.4-7	$P=q_h(GC_p)(\gamma_E)(\gamma_a)=$	-11.73	-11.73	-15.46	-19.19	
	GC _p =	0.9			Figure 30.3-2	
	$P=q_h(GC_p)(\gamma_E)(\gamma_a)=$	9.60			Equation 29.4-7	

Ratter Attachments: 0.6D+0.6W (CD=1.6)

Connection Check

•	omiconon oncon				
	5/16" Lag Screw Withdra Lag Screw Penetration		266 ll 2.5 i	•	Table 12.2A - NDS DFL Assumed
	•	Coefficient	1.4		
	Allowable	Capacity=	760 II	bs	
Zone	Average Trib Width	Area (ft)	Uplift (lbs)	Down (lbs)	
Zone(1,2e,2r)	4	10.2	85.7	122.1	
Zone(2n)	4	10.2	85.7	122.1	
Zone(3r)	2	5.1	53.7	122.1	
Zone(3e)	2	5.1	64.6	122.1	
	Conserva	ative Max=	85.7	<	760
			CONNECTION IS	ОК	

1. Pv seismic dead weight is negligible to result in significant seismic uplift, therefore the wind uplift governs



Vertical Load Resisting System Design

Trusses

Max Length, L = 8.0 ft (Beam maximum Allowable Horizontal Span)

Tributary Width, $W_T = 24$ in

Dr = 10 psf 20 plf

 $L_r = 20 \text{ psf}$

W_{down}= 9.60 psf 19.2 plf Pv= 3 psf 6 plf

Load Case: DL+0.6W (CD=1.6)

Pv max Shear= 122.1 lbs

Max Moment, M_u = 180 lb-ft Conservative

Max Shear, $V_u=wL/2+Pv$ Point Load = 226 lb

Note: Proposed loading will add less than 5% of the existing loads.

Member Capacity

ı	DF-L No.2									
	2X4	Design Value	C_L	C_F	C _i	C_{r}	K_{F}	ф	λ	Adjusted Value
	F _b =	900 psi	1.0	1.5	1.0	1.15	2.54	0.85	0.8	1553 psi
	F _v =	180 psi	N/A	N/A	1.0	N/A	2.88	0.75	8.0	180 psi
	E =	1600000 psi	N/A	N/A	1.0	N/A	N/A	N/A	N/A	psi
	E _{min} =	580000 psi	N/A	N/A	1.0	N/A	1.76	0.85	N/A	580000 psi

Depth, d = 3.5 in Width, b = 1.5 in

al Area, $A = 5.25 \text{ in}^2$

Cross-Sectonal Area, A = 5.25 in^2 Moment of Inertia, $I_{xx} = 5.35938 \text{ in}^4$

Section Modulus, $S_{xx} = 3.0625 \text{ in}^3$

Allowable Moment, $M_{all} = F_b'S_{xx} = 396.2 \text{ lb-ft}$ DCR= $M_u/M_{all} = 0.45 < 1$ Satisfactory

Satisfactory

Allowable Shear, $V_{all} = 2/3F_v A = 630.0 \text{ lb}$ DCR= $V_u V_{all} = 0.36 < 1$



Siesmic Loads Check

Roof Dead Load	10 psf
% or Roof with Pv	18.6%
Dpv and Racking	3 psf
Average Total Dead Load	10.6 psf
Increase in Dead Load	2.2% <mark>OK</mark>

The increase in seismic Dead weight as a result of the solar system is less than 10% of the existing structure and therefore no further seismic analysis is required.

Limits of Scope of Work and Liability

We have based our structural capacity determination on information in pictures and a drawing set titled PV plans - ANDY BUERGO. The analysis was according to applicable building codes, professional engineering and design experience, opinions and judgments. The calculations produced for this structure's assessment are only for the proposed solar panel installation referenced in the stamped plan set and were made according to generally recognized structural analysis standards and procedures.