STATE OF NEW HAMPSHIRE ELECTRICIANS BOARD

NAME: WILLIAM N LEVAY

EXPIRES: 06/30/2023



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September 25, 2020

To: ReVision Energy

7 Commercial Drive Brentwood, NH 03833

Subject: Structural Certification for Installation of Solar Panels

Forman Residence 197 Main Street Meriden, NH. 03781

To Whom It May Concern,

A design check for the subject residence was done on the existing roofing and framing systems for the installation of solar panels over the roof. From a field inspection of the property, the existing roof support structures were observed by the client's auditors as follows:

The roof structure of the barn consists of metal roofing over 1x4 horizontral strappings at 24" o.c. that are supported by nominal 2x12 rafters at 24" o.c.. There are three 12'-0" bays of rafters that are supported by double 1.75x19.5 beams between bays. The double 1.75×19.5 wood beams sandwich 6x6 posts with 4x6 knee braces at 14'-0" o.c.. The rafters are connected to a continuous 2x12 ridge board at the peak, and are supported by the exterior double 1.75×19.5 header beam at the eave. There are 2x8 collar ties at 24" o.c. for structural stability.

The existing roof framing system of (MP1) is judged to be adequate to withstand the loading imposed by the installation of the solar panels. No reinforcement is necessary.

The spacing of the solar standoffs should be kept at 48" o.c. with a minimum of (4) 5/16" x 2" lag screws into the 1x4 strappings with a staggered pattern to ensure proper distribution of loads.

I further certify that all applicable loads required by the codes and design criteria listed below were applied to the Ironridge solar rail system and analyzed. Furthermore, the installation crews have been thoroughly trained to install the solar panels based on the specific roof installation instructions developed by Ironridge for the racking system and Ecofasten for the roof connections. Finally, I accept the certifications indicated by the solar panel manufacturer for the ability of the panels to withstand high wind and snow loads.

Design Criteria:

- Applicable Codes = 2015 IBC/IRC, ASCE 7-10, and 2015 NDS
- Roof Dead Load = 9 psf (MP1) 8 psf (MP2)
- Roof Live Load = 20 psf
- Wind Speed = 115 mph, Exposure C
- Ground Snow Load = 90 psf Roof Snow Load = 63 psf

Please contact me with any further questions or concerns regarding this project.

Sincerely,

Elaine Huang, P.E. Project Engineer





Wind Calulations

Per ASCE 7-10 Components and Cladding

Inpu	4	V	o el	-	ki	-
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Wind Speed	115 mph
Exposure Category	С
Roof Shape	Gable/Hip
Roof Slope	28 degrees
Mean Roof Height	20 ft
Building Least Width	40 ft
Effective Wind Area	17.5 ft

Design Wind Pressure Calculations

Wind Pressure P = qh*(G*Cp)	
qh = 0.00256 * Kz * Kzt * Kd * V^2 * I	(Eq_30.3-1)
Kz (Exposure Coefficient) = 0.9	Table 30.3-1)
Kzt (topographic factor) = 1	(Fig. 26.8-1)
Kd (Wind Directionality Factor) = 0.85	Table 26.6-1)
V (Design Wind Speed) = 115 mph	
I Importance Factor = 1	(Table 1.5-1)
ah = 25.90	

Standoff Uplift Calculations

 	otaliaon opin	Concalations			
	Zone 1	Zone 2	Zone 3	Positive	
GCp =	-0.90	-1.10	-1.10	0.85	(Fig. 6-11)
Uplift Pressure =	-23.31 psf	-28.49 psf	-28.49 psf	22.0 psf	11.00.00
X Standoff Spacing =	4.00	4.00	4.00		
Y Standoff Spacing =	2.75	2.75	2.75		
Tributary Area =	11.00	11.00	11.00		
Footing Uplift =	-256 lb	-313 lb	-313 lb		

Standoff Uplift Check

Maximum Design Uplift = -313 lb
Standoff Uplift Capacity = 400 lb
400 lb capacity > 313 lb demand Therefore, OK

Fastener Uplift Capacity Check

rasiellei -	1-3/10 Gala	y
Number of Fasteners =	4	
Embedment Depth =	1	
Pullout Capacity Per Inch =	150 lb	NDS Eq 12.2-1
Fastener Capacity =	600 lb	NDS Eq 11.3-1
w/ F.S. of 1.0 =	600 lb	
600 lb capacity > 313 lb demand	Therefore, OK	

Fastener Shear Capacity Check

Embedment Depth Reduction Factor	1	
Lateral Force From Gravity Loads	264	
Attachment Lateral Capacity	288	(NDS Table 12K)
288 lb capacity > 265 lb deman	d Therefore, OK	

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US





Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014, NEC 2017 and NEC 2020 per article 690.11 and 690.12

- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)



NVERTER

/ Single Phase Inverter with HD-Wave Technology for North America

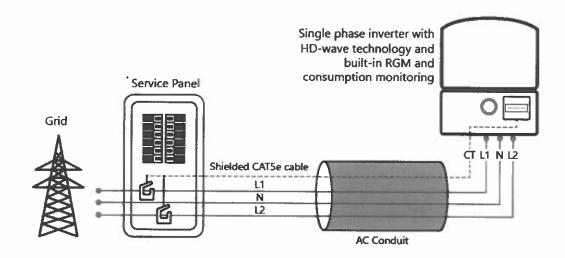
SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US SE	11400H-US	
ADDITIONAL FEATURES								
Supported Communication Interfaces			RS485, Ethernet	, ZigBee (optional), C	ellular (optional)			Ī
Revenue Grade Metering, ANSI C12.20								1
Consumption metering	1			Optional				
Inverter Commissioning		With the SetAp	pp mobile applicatio	n using Built-in Wi-Fi	Access Point for Lo	cal Connection		1
Rapid Shutdown - NEC 2014, NEC 2017 and NEC 2020, 690.12			100.11	i Shutdown upon AC				
STANDARD COMPLIANCE				27.5				
Safety		UL1741, U	L1741 SA, UL1699B,	CSA C22.2, Canadian	AFCI according to	T.I.L. M-07	-	
Grid Connection Standards		IEEE1547, Rule 21, Rule 14 (HI)						
Emissions		FCC Part 15 Class B						
INSTALLATION SPECIFICAT	IONS		_ = 000					
AC Output Conduit Size / AWG Range		1"	Maximum / 14-6 AV	VG		1" Maximum /14-	4 AWG	
DC Input Conduit Size / # of Strings / AWG Range		1" Maximum / 1-2 strings / 14-6 AWG						
Dimensions with Safety Switch (HxWxD)		17.7 x	14.6 x 68 / 450 x 37	0 x 174		21.3 x 14.6 x 7.3 / 540	x 370 x 185	in/mm
Weight with Safety Switch	22	/ 10	25.1 / 11.4	262	/ 11.9	38.8 / 17 6		lb/kg
Noise		<	25		NC.	<50		dBA
Cooling			-	Natural Convection				
Operating Temperature Range			-40	to +140 / -40 to +6	0(4)			*F / *C
Protection Rating			NEMA 4	X (Inverter with Safet	y Switch)			-

⁽³⁾ Inverter with Revenue Grade Meter P/N: SExxxxH-US000BNC4: Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BNI4 . For consumption metering, current transformers should be ordered separately. SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box

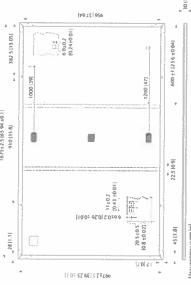
How to Enable Consumption Monitoring

By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, homeowners will gain full insight into their household energy usage helping them to avoid high electricity bills



⁽⁴⁾ Full power up to at least 50°C / 122°F; for power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

REC N-PEAK SERIES



ELE TRICAL DATA - STC		Pro	Product code" REC xxxNP	PEC KXXNP	ì	
Homisal Power - P (Wp)	305	DIE	315	320	325	330
Watt Class Sorting: (W)	0/-5	0/+5	0/+5	5.70	0/•2	5./0
Hominal Power Voltage - V _{stry} (V)	333	336	33.9	34.2	344	346
Normal Power Current - i, , , (A)	9.17	924	1E 6	9.37	9 46	9.55
OpenCircuit Voltage - V., (V)	39.3	268 ,	10 0	403	40.7	410
ShortCurrent-I _L (A)	90 OL	10 12	21.01	10.22	10.28	10.33
Panel Efficiency (%)	E 99	18 6	19.9	269	\$ 61	19.8
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ELECTRICAL DATA NOC.		Pro	Product code": RECereMP	RECARRAD		
Nominal Power - P. v. (Wp)	231	234	238	242	246	756
Hommat Power Voltage - V Hw [V]	31.1	314	31.7	32.0	32.2	32.4
Nominal Power Current -1, _{cv} (A)	7,48	7 46	7.52	757	764	17
OpenCacut Voltage - V., (V)	36 7	37 \$	37.4	37.7	380	38.3
Short Circuit Current (I), [A)	613	8.17	8 21	8.25	8 30	834
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757	7.52	7.46	7,48	Nominal Power Current - I, ev [A]
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WARRANTY	installed by an R Certified Solar Professional Systemsite
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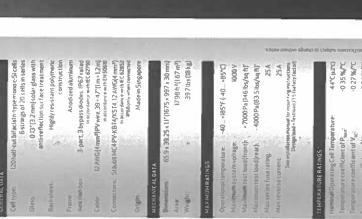
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ž	251W 25-5001	25	X	Q.	9836	0.5%	86%	Arrem ap	
Y-6-5	SHW	55	52	25	9686	9650	9696	Somecon	
92	\$UP.	8	1/3	0	9836	%50	86%	5 for 36 1345	
installed by an REC Certified Solar	Systemsize	Product Warranty (yrs)	Power Warranty (yrs)	Labor Warranty (yrs)	Power on Year I	Armuel Degradation	Power in Year 25	See warranty 30x uments for Jetads Some conditions op	

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REC

POWER



447474
-0.35%/TC
-0.27 %/TC
0.04%/10
0.00











PREMIUM MONO N-TYPE SOLAR PANELS WITH SUPERIOR PERFORMANCE





























