

1011 N Causeway Blvd, Suite 19 + Mandeville, Louisiana 70471 + Phone: 985.624.5001 + Fax: 985.624.5303

July 2021

Property Owner: Donald James

Property Address: 134 Southern Place, Lillington, NC 27546

RE: Photovoltaic System Roof Installations

I have reviewed the existing structure referenced above to determine the adequacy of the existing structure support the proposed installation of an array of solar panels on the roof.

Based on my review, the existing structure is adequate to support the proposed solar panel installation. This assessment is based on recent on-site inspection by SunPro Solar inspectors and photographs of the existing structure. The photovoltaic system is designed to withstand uplift and downward forces; our assessment is regarding the structure's support of the array. Stresses induced by the introduction of individual mount loads on the rafters are within acceptable limits as shown on the attached calculations. The structural considerations used in our review and assessment include the following:

PETE 2018

""NEC 2017

Evaluation Criteria:

Applied Codes: ASCE 7-10 PEDE 2018 Risk Category: II Design Wind Speed (3-second gust): 117 MPH Wind Exposure Category: C Ground Snow Load: 10 PSF Seismic Design Category: D

Existing Structure:

Roof Material: Shingle Roofing Structure: 2x6 rafters @ 24" O.C. Roof Slope: 7/12

Connection of Array to Structure:



North Carolina Firm No. C4113 Principal Engineering, Inc.

Manufacturer: UNIRAC Mount: Flashloc Comp Kit Mounting Connection: Flashloc Comp Kit 5/16" lag screw w/min 2.5" embedment into framing Zone 1: 2 rails 4'-0" o.c. mounts Zone 2: 2 rails 4'-0" o.c. mounts Zone 3: 2 rails 4'-0" o.c. mounts



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Effect of the Solar Array on Structure Loading:

Gravity Loads:

Per IBC Section 1607.12.5.1, the areas of the roof where solar panels are located are considered inaccessible, and therefore not subject to roof live loading. Live load in these areas is replaced by the dead load of the solar array, 3 psf. The total gravity load on the structure is therefore reduced and the structure may remain unaltered. Connections of the mounts to the underlying structure are to be installed in a staggered pattern, except at the array ends, to distribute the loading evenly to the roof structure. The stresses within the rafters due to the introduction of discrete mount loads are within acceptable limits, as shown on the attached calculations.

Wind Load:

The solar panel array will be flush mounted (no more than 6" above the surrounding roof surface, and parallel to the roof surface. Any additional wind loading on the structure due to the presence of the array is negligible. The array structure is designed by the manufacturer to withstand uplift and downward forces resulting from wind and snow loads. The attached calculations verify the capacity of the connection of the solar array to the roof to resist uplift due to wind loads, the governing load case.

Snow Load:

The reduced friction of the glass surface of the solar panels allows for the lower slope factor (C_s) per Section 7.4 of ASCE 7-10 resulting in a reduced design snow load for the structure. This analysis conservatively considered the snow load to be unchanged.

Seismic Load:

Analysis shows that additional seismic loads due to the array installation will be small. Even conservatively neglecting the wall materials, the solar panel installation represents an increase in the total weight of the roof and corresponding seismic load of less than 10%. This magnitude of additional forces meets the requirements of the exception in Section 11B.4 of ASCE 7-10. The existing lateral force resisting system of the structure is therefore allowed to remain unaltered.

Conclusion:

To the best of my professional knowledge and belief, the subject construction and photovoltaic system installation will be in compliance with all state and local building codes and guidelines in effect at the time of our review.

Limitations:

Engineer's assessment of the existing structure is based on recent field reports and current photographs of the elements of the structure that were readily accessible at the time of inspection. The design of the solar panel racking (mounts, rails, connectors, etc.), connections between the racking and panels, and electrical engineering related to the installation are the responsibility of others. The photovoltaic system installation must be by competent personnel in accordance with manufacturer recommendations and specifications and should meet or exceed industry standards for quality. The contractor is responsible for ensuring that the solar array is installed according to the approved plans and must notify the engineer of any undocumented damage or deterioration of the structure, or of discrepancies between the conditions depicted in the approved plans and those discovered on site so that the project may be reevaluated and altered as required. Engineer does not assume any responsibility for improper installation of the proposed photovoltaic system.

Uplift and Wind Downforce Calculation Summary (ASCE 7-10) Mount, Rack, & Panel Proportioning

Property Owner:	Donald James Individual Panel Dimensions		ensions			
Project Address:	134 Southern Place	Length (in)	Width (in)	Area (sf)		
City, State:	Lillington, NC 27546	77	39	20.85		

Wind Load Calculation Summary (ASCE 7-10 C&C Provisions)				
Building Characteristics, Design Input, and Adjustment Factors				
Roof Dimensions: Length (b):	53 ft.			
Width (w):	51 ft.	Least Dimension: 51 ft.		
Roof Height (h):	15 ft.	Must be less than 60 🗸		
Pitch: 7 on 12 =	30.3°	Must be less than 45° 🖌		
Roof Configuration	Gable			
Roof Structure:	2x Rafters			
Roof material:	Plywood			
Ultimate Wind Speed (mph):	117	From ASCE 7-10, Fig. 26.5		
Exposure Category:	С	Para 26.7.3		
Directionality Factor, K _d	0.85	Table 26.6-1		
Risk Category:	2	Table 1.5-2		
Exposure Coefficient, K _z	1.09	Table 30.3-1		
Topographic Adj., K _{zt}	1	Fig. 26.8-1		
Effective Wind Area (sf):	21	(Area per individual panel)		
Velocity Pressure (psf), q _h :	32.47	psf, Eq. 30.3-1		
Internal Pressure Coeff, GC _{pi}	0.18	Table 26.11-1		

Roof Zone Strip (a), in ft, Fig. 30.5-1, Note 5		
1 - Least Roof Horizontal Dimension (L or W) x 0.10	5.1	
2 - Roof Height x 0.4	6	
3 - Least Roof Horizontal Dimension (L or W) x 0.04	2.04	
4 - Lesser of (1) and (2)	5.1	
5 - Greater of (3) and (4)	5.1	
6 - Greater of (5) and 3 feet	a= 5.1 ft.	

	Net Design Wind Pressures					
	(ASCE 7, Eq. 30.4.1; Load Factor for ASD = 0.6, per ASCE 7, 2.4.1)					
	Uplift (-psf) Down (psf)					
	GC _p	Pressure	GC _p	Pressure	Description of Zone	
Zone 1	-0.95	-22.0	0.85	20.0	Interior Roof Area, >(a) ft from edge	
Zone 2	-1.12	-25.3	0.85	20.0	Strip of (a) ft wide at roof edge	
Zone 3	-1.12	-25.3	0.85	20.0	Corner intersection of Zone 2 strips	

Snow Load				
Ground Snow Load, p _g	10.0	From ASCE 7 or AHJ		
Terrain Category:	С	Para 6.5.6.3		
Exposure	Fully			
Exposure FactorCe	0.9	Table 7-2		
Thermal Factor, Ct	1.0	Table 7-3		
Importance Factor, I _s	1.0	Table 1.5.2		
Roof Configuration	Gable			
Roof Slope	30.3°			
Distance from Eave to Ridge	25.5			
p _m , Minimum required Snow Load	N/A	Para. 7.3.4		
pf, Calculated Snow Load	6.30	Eq. 7.3-1		
pf, Design Snow Load	6.30 psf			

Mount Selection and Spacing				
Manufacturer: Unirac		Unirac	Perpendicular Panel Orientation	
Mount:		Flashloc Comp Kit	Allowable Arrangement by Uplift Pressure	
Substrate	e:	Wood Rafters	< 37 psf: 2 rails, mounts @ 4'-0" o.c.	
Connecto	or:	5/16" x 4" Lag Screw	37 to 75 psf: 2 rails, mounts @ 2'-0" o.c.	
			75 to 112 psf: 3 rails, mounts @ 2'-0" o.c.	
Allowable	e Uplift:	480 max.	112 to 150 psf: 4 rails, mounts @ 2'-0" o.c.	
	Required	Mount Layout	> 150 psf : Mount capacity exceeded	
Zone 1	2 rails, m	ounts @ 4'-0" o.c.		
Zone 2 2 rails, mounts @ 4'-0" o.c.		ounts @ 4'-0" o.c.		
Zone 3 2 rails, mounts @ 4'-0" o.c.		ounts @ 4'-0" o.c.		
(Allowable loads are based on individual mount failure before rail fai			individual mount failure before rail failure)	



North Carolina Firm No. C4113 Principal Engineering, Inc.

NEW PHOTOVOLTAIC SYSTEM 12.41 KW DC 134 SOUTHERN PL, LILLINGTON, NC 27546, USA

GENERAL NOTES		VICINITY M
1.1.1 <u>PROJECT NOTES:</u> 1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING	PROJECT INFORMATION OWNER NAME: DON JAMES	Hern PI
JURISDICTION'S (AHJ) APPLICABLE CODES. 1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION 1.1.4 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE MICRO-INVERTER IN ACCORDANCE WITH NEC 690.41(B) 1.1.5 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC	PROJECT MANAGER NAME: SHAHIN HAYNES PHONE: 8665071461 <u>CONTRACTOR NAME</u> MARC JONES CONSTRUCTION, LLC DBA SUNPRO SOLAR PHONE: 5052180838	134 Southern PI, Lillington, NC
690.4: PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY 1.1.6 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED	FTIONE. 3032 100030	SATELLITE
TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7. 1.1.7 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4. SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3]. 1.1.8 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT.	SCOPE OF WORK SYSTEM SIZE: STC:34 X 365W= 12.41 kW DC PTC: 34 x 341.6W = 11.61 kW DC (34) LG ELECTRONICS LG365N1C-A6 (34) ENPHASE IQ7PLUS-72-2-US	TISA Southern PI. Lillington, NC
ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.	ATTACHMENT TYPE: ROOF MOUNT MSP UPGRADE: YES	154
1.2.1 <u>SCOPE OF WORK:</u> 1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT	AUTHORITIES HAVING JURISDICTION BUILDING: HARNETT COUNTY ZONING: HARNETT COUNTY UTILITY: SOUTH RIVER EMC METER NO: 17104633	G-001 COVER PAGE G-002 NOTES A-101 SITE PLAN A-102 ELECTRICAL PLAN A-103 ATTACHMENT PLAN A-104 STRUCTURAL PLAN
 1.3.1 WORK INCLUDES: 1.3.2 PV RACKING SYSTEM INSTALLATION - UNIRAC SOLAR 1.3.3 PV MODULE AND INVERTER INSTALLATION - LG ELECTRONICS LG365N1C-A6 / ENPHASE IQ7PLUS-72-2-US INVERTER 1.3.4 PV EQUIPMENT ROOF MOUNT 1.3.5 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX 1.3.6 PV LOAD CENTERS (IF INCLUDED) 	DESIGN SPECIFICATION OCCUPANCY:IICONSTRUCTION:SINGLE-FAMILY ZONING:ZONING:RESIDENTIAL GROUND SNOW LOAD:GROUND SNOW LOAD:REFER STRUCTURAL LETTER WIND EXPOSURE:WIND SPEED:REFER STRUCTURAL LETTER	E-601LINE DIAGRAME-602ELECTRICAL CALCULATIOE-603PLACARDR-001RESOURCE DOCUMENTR-002RESOURCE DOCUMENTR-003RESOURCE DOCUMENTR-004RESOURCE DOCUMENTR-005RESOURCE DOCUMENTR-006RESOURCE DOCUMENT
 1.3.7 PV METERING/MONITORING (IF INCLUDED) 1.3.8 PV DISCONNECTS 1.3.9 PV GROUNDING ELECTRODE & BONDING TO (E) GEC 1.3.10 PV FINAL COMMISSIONING 1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV 1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE 	APPLICABLE CODES & STANDARDS BUILDING: IBC 2015, IRC 2015 ELECTRICAL: NEC 2017 FIRE: IFC 2018	R-007 RESOURCE DOCUMENT R-008 RESOURCE DOCUMENT

		CON	ITRACTOR		
	SU	N			
MAP		NDEV	71 MCH RD /ILLE, LA 70471 E: 9152011490		
Clark Rd	SYSTEM SIZE: DC SIZE: 12.410 KW DC-(STC				
			9.860 KW AC NAME & ADDRESS		
			JAMES		
	Р	L,LII	SOUTHERN LLINGTON, 27546,USA		
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2.1.1 <u>SITE NOTES</u> :	2.4.6 AC CONDUCTORS COLORED OR MARKED AS FOLLOWS:
2.1.2 A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH	CONVENTION IF THREE PHASE PHASE C OR L3- BLUE,
OSHA REGULATIONS. 2.1.3 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS	YELLOW, ORANGE**, OR OTHER CONVENTION NEUTRAL-
SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE	WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE
BATTERIES.	PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].
2.1.4 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING,	-
MECHANICAL, OR BUILDING ROOF VENTS.	2.5.1 <u>GROUNDING NOTES</u> :
2.1.5 PROPERACCESS AND WORKING CLEARANCE AROUND EXISTING	2.5.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR
AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS	THEIR PURPOSE, AND GROUNDING DEVISES EXPOSED TO THE
PERSECTION NEC 110.26. 2.1.6 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND	ELEMENTS SHALL BE RATED FOR SUCH USE.
MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED	2.5.3 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC
MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING	690.43 AND MINIMUM NEC TABLE 250.122.
SERVES TO PROTECT THE BUILDING OR STRUCTURE.	2.5.4 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND
2.2.1 EQUIPMENT LOCATIONS:	ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134
	AND 250.136(A).
2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.	ACCORDING TO NEC 690.45 AND MICROINVERTER
2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED	
FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31	
(A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).	GROUNDING CLIPS AS SHOWN IN
2.2.4 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV	MANUFACTURERDOCUMENTATION AND APPROVED BY THE AHJ.
MODULES ACCORDING TO NEC 690.34.	IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE
2.2.5 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE	INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE
INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT. 2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED	MANUFACTURERS' INSTALLATION REQUIREMENTS. 2.5.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE
PERSONNEL ACCORDING TO NEC APPLICABLE CODES.	ARRANGED SUCH THAT THE REMOVAL OFA MODULE DOES NOT
2.2.7 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED	INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
FOR OUTDOOR USAGE WHEN APPROPRIATE.	2.5.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED,
2.3.1 STRUCTURAL NOTES:	SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR
	LARGER [NEC 250.119]
2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO	2.5.9 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS
CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A	INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE
DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUSTALSO	SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND
EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S	AHJ.
INSTRUCTIONS.	2.5.10 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC
2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS'	690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS
SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED &	
SEALED PER LOCAL REQUIREMENTS.	2.6.1 DISCONNECTION AND OVER-CURRENT PROTECTION
2.3.4 ROOFTOP PENETRATIONS FOR PV RACEWAY WILLBE COMPLETED	NOTES:
AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.	2.6.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH
2.3.5 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO	THAT WHENTHE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARECONNECTED TO THE TERMINALS
GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING	MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
MANUFACTURER.	2.6.3 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY
2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL	PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.	2.6.4 PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS
2.4.1 WIRING & CONDUIT NOTES:	SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE
	SHOCK HAZARD FOR EMERGENCY RESPONDERS IN
2.4.2 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR	ACCORDANCE WITH 690.12(A) THROUGH (D). 2.6.5 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING
THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS AREBASED	TO NEC 690.8, 690.9, AND 240.
ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT	2.6.6 MICROINVERTER BRANCHES CONNECTED TO A SINGLE
UP-SIZING. 2.4.3 CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.	BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC
2.4.4 VOLTAGE DROP LIMITED TO 1.5%.	110.3(B).
2.4.5 DC WIRING LIMITED TO MODULE FOOTPRINT.	2.6.7 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT
MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND	CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND

UL1699B.

MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.

R OTHER BLUE, 2.7.2 LOAD-SIDE INTERCONNECTION SHALL BE IN NEUTRAL-

ACCORDANCE WITH [NEC 705.12 (B)] 2.7.3 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(B)(2)(3)(b)]. 2.7.4 THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].

2.7.1 INTERCONNECTION NOTES:

2.7.5 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C). 2.7.6 FEEDER TAP INTERCONECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1) 2.7.7 SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42 2.7.8BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

CONTRACTOR

22171 MCH RD MANDEVILLE, LA 70471 PHONE: 9152011490

SYSTEM SIZE:

DC SIZE: 12.410 KW DC-(STC)

AC SIZE: 9.860 KW AC

CUSTOMER NAME & ADDRESS

DON JAMES

134 SOUTHERN PL,LILLINGTON, NC 27546,USA

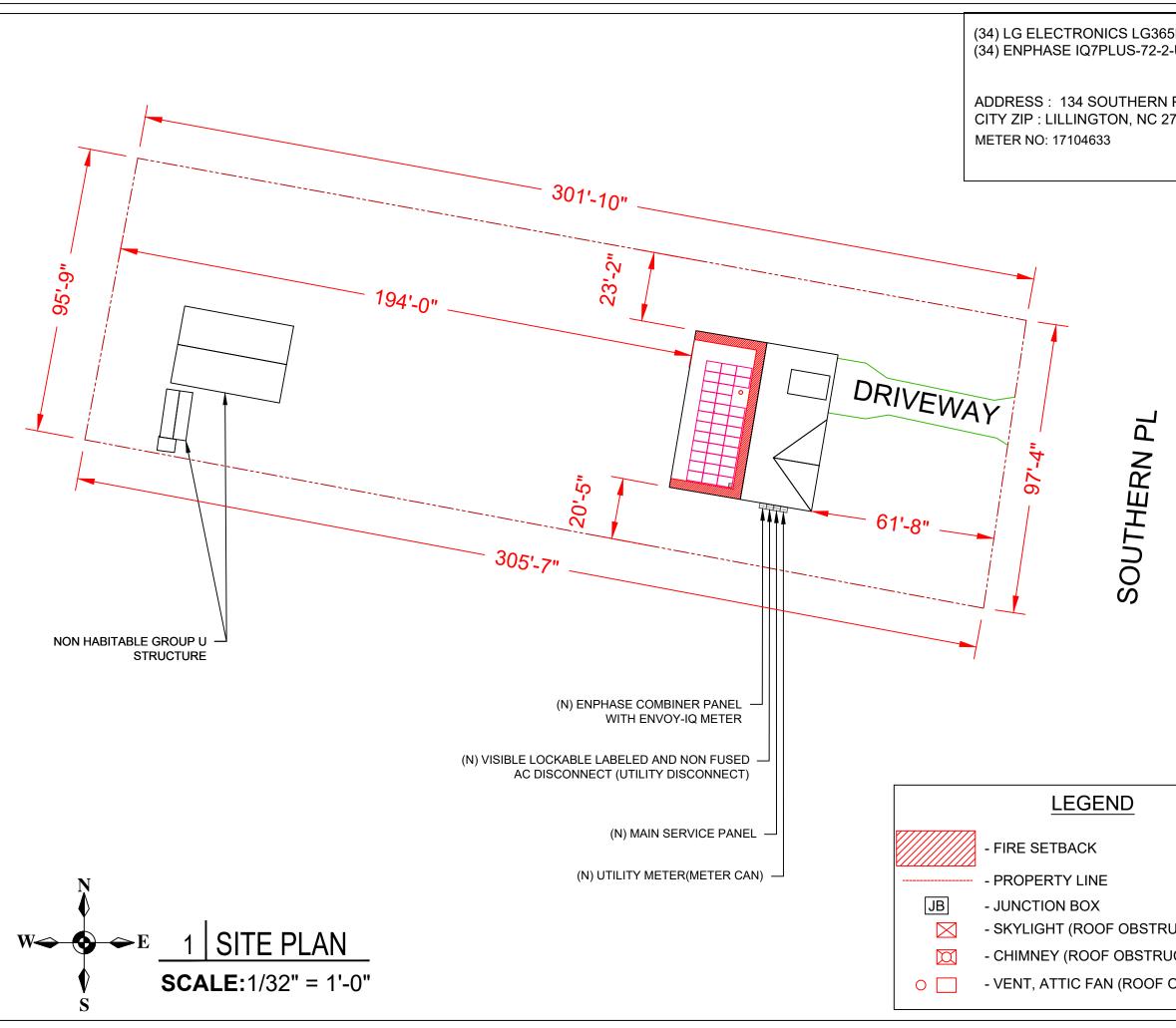
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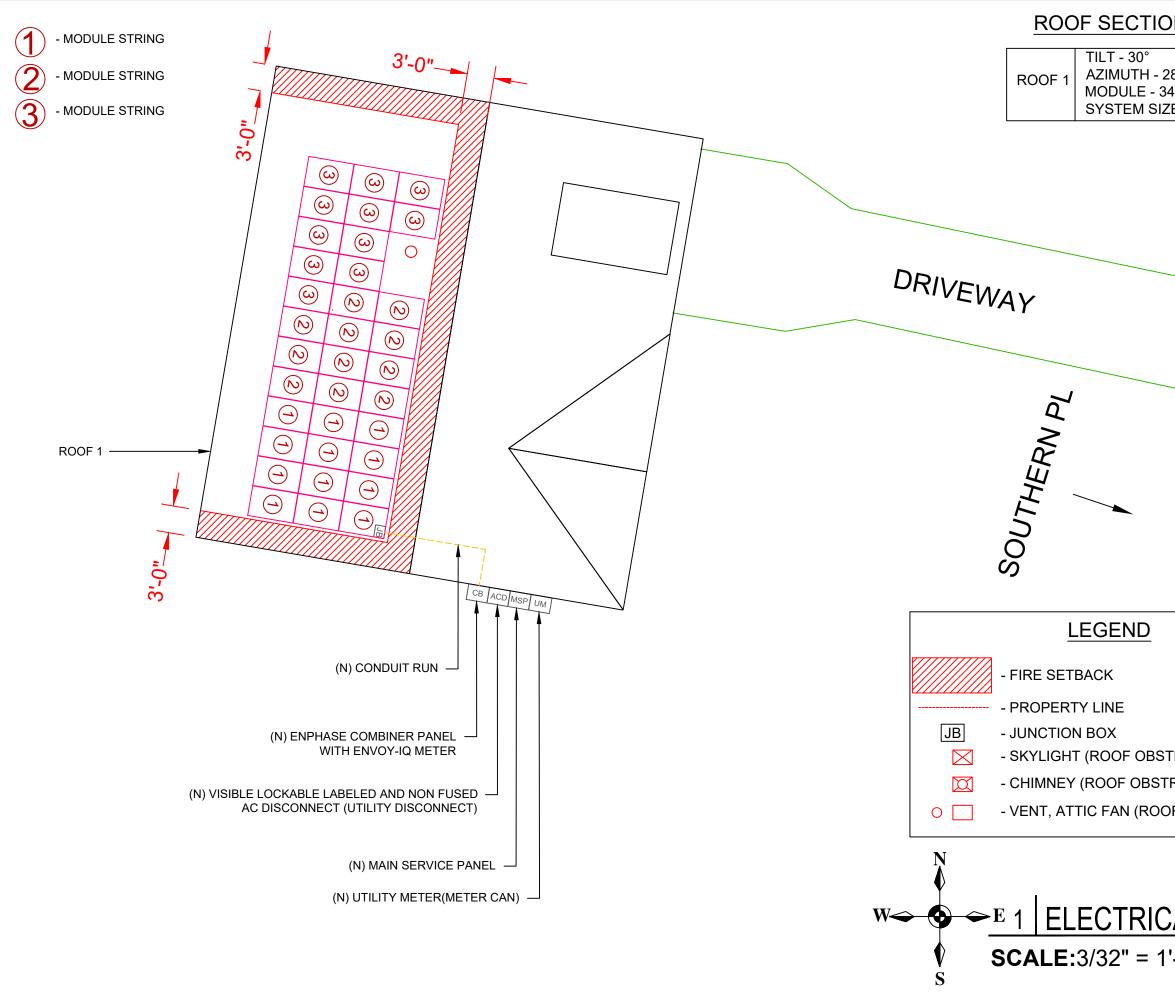
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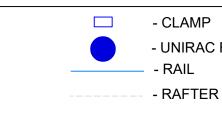
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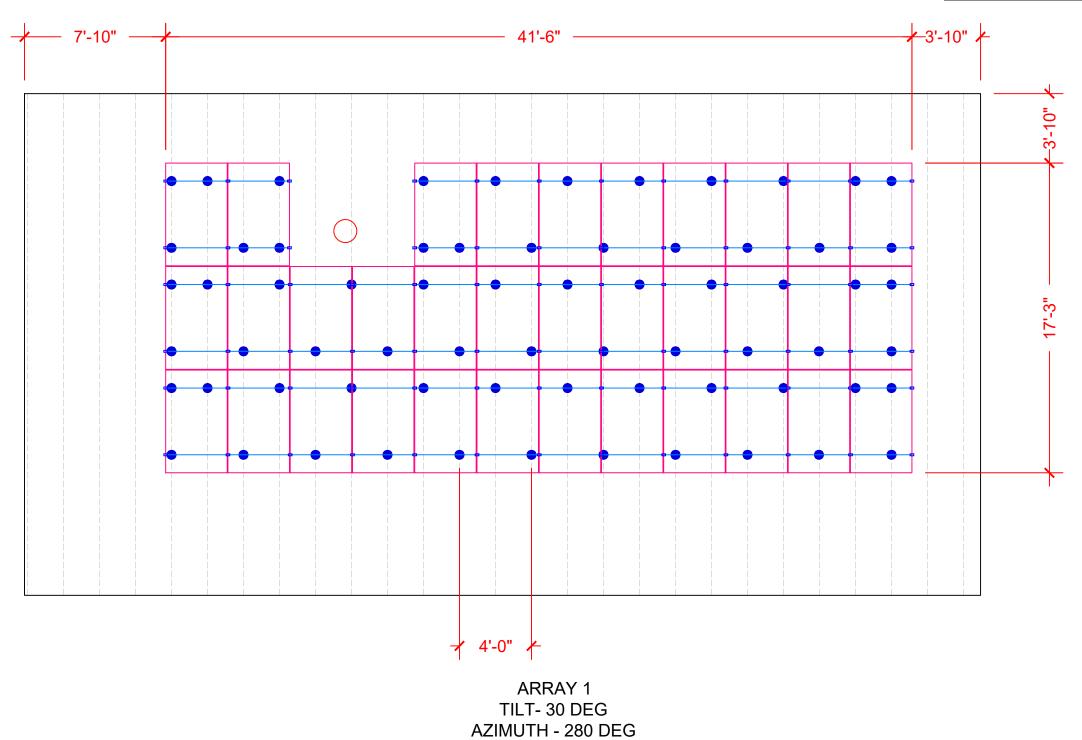
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N PL 27546	MANDE	171 MCH RD EVILLE, LA 70471 IE: 9152011490		
	SYS	STEM SIZE:		
		: 12.410 KW DC-(STC)		
	AC SIZE	: 9.860 KW AC		
	CUSTOMER	R NAME & ADDRESS		
	DOI	N JAMES		
	PL,L	SOUTHERN ILLINGTON, 27546,USA		
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OBSTRUCTION)	A-101			

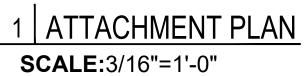


	CON	TRACTOR
<u>N(S)</u> 80°	SUN	IPR
4 E (KW)- 12.41	MANDE	71 MCH RD VILLE, LA 70471 E: 9152011490
	DC SIZE: AC SIZE:	<u>STEM SIZE</u> : 12.410 KW DC-(STC) 9.860 KW AC
		NAME & ADDRESS
	134 \$ PL,LI	I JAMES SOUTHERN LLINGTON, 27546,USA
		REVISIONS
	REV	DESCRIPTION
		7/14/2024
	DRAWN DATE	7/14/2021 BVP
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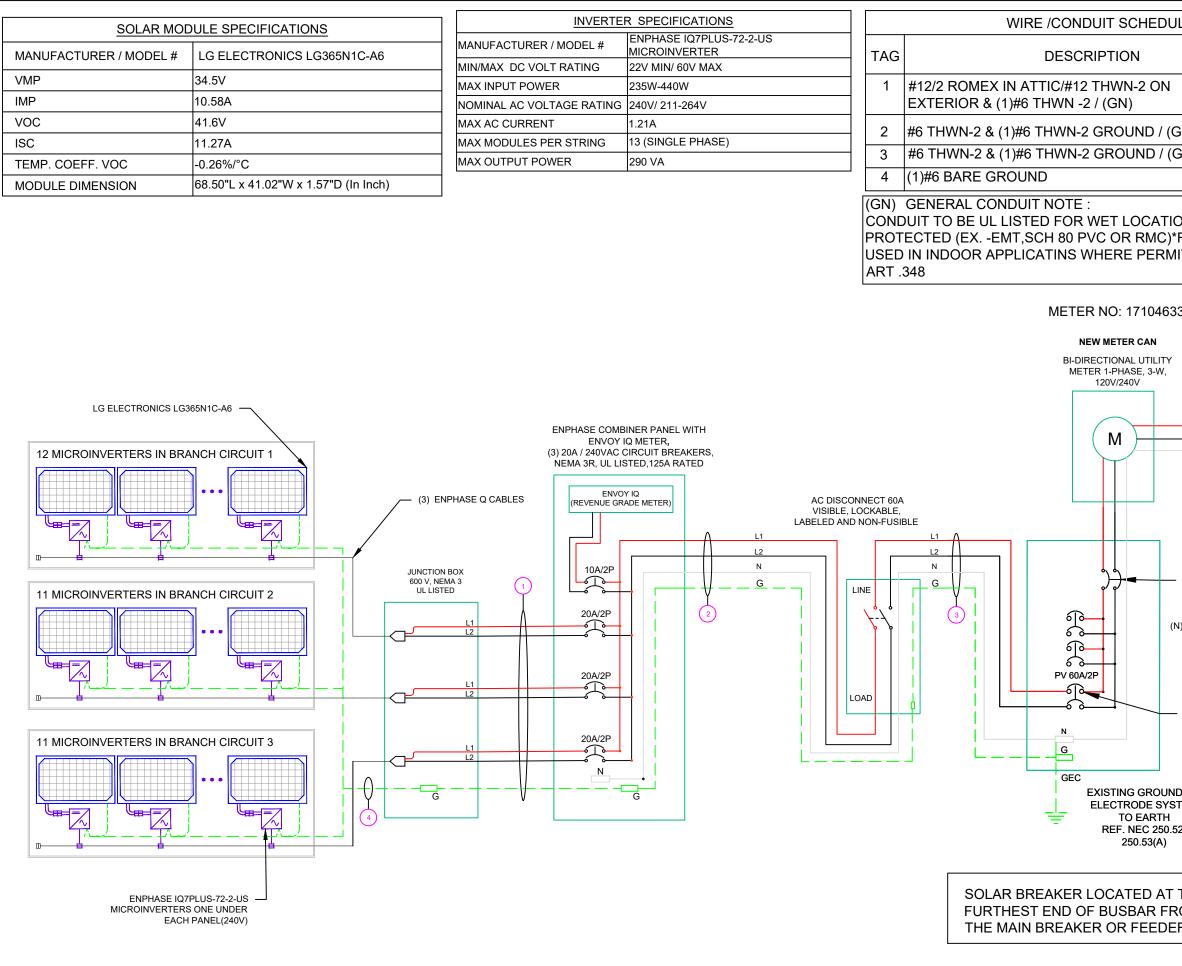


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- CLAMP		CON	TRACTOR
- UNIRAC FLASHLOC - RAIL - RAFTER	SU	Ν	
- TOTAL MOUNT		NDEV	1 MCH RD ILLE, LA 70471 : 9152011490
		SYS	TEM SIZE:
e	DCS	SIZE: 1	2.410 KW DC-(STC)
	AC S	SIZE: 9	9.860 KW AC
 	CUSTO	MER N	NAME & ADDRESS
	l	DON	JAMES
3'-10"	P	L,LIL	OUTHERN .LINGTON, 7546,USA
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	REV		DESCRIPTION
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JLE	CON	NTRACTOR
	SUN	IPR●
GN) GN)	MANDE	71 MCH RD VILLE, LA 70471 E: 9152011490
	SYS	STEM SIZE:
	DC SIZE:	12.410 KW DC-(STC)
ONS AND UV *FMC MAYBE	AC SIZE:	9.860 KW AC
AITTED BY NEC	CUSTOMER	NAME & ADDRESS
	DON	JAMES
33	PL,LI	SOUTHERN LLINGTON, 27546,USA
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	olgrida	
 (N) MAIN BREAKER TO HOUSE 240 V, 200A/2P (TOP FED) 		
(N) MAIN SERVICE PANEL		
225A RATED, 240V LOAD/LINE SIDE INTERCONNECTION AT MAIN PANEL PER ART. 705.12(B)		
- BACKFEED		
NDING STEM		
52,		
THE ROM ER UNIT		DIAGRAM
	SHEE	T NUMBER
	E-	601
	1	

AMBIENT TEMPERATURE SPECS		PERCENT OF	NUMBER OF CURRENT	
RECORD LOW TEMP	-10°	VALUES	CARRYING CONDUCTORS	
AMBIENT TEMP (HIGH TEMP 2%)	36°	.80	4-6	
CONDUIT HEIGHT	0.5"	.70	7-9	
CONDUCTOR TEMPERATURE RATE	90°	.50	10-20	

CALCULATIONS:

1. CURRENT CARRYING CONDUCTOR

(A) <u>BEFORE IQ COMBINER PANEL</u>
AMBIENT TEMPERATURE - (36)°C ...NEC 310.15(B)(3)(c)
TEMPERATURE DERATE FACTOR - 0.91 ...NEC 310.15
(B)(2)(a)
GROUPING FACTOR - 0.8...NEC 310.15(B)(3)(a)

CONDUCTOR AMPACITY

= (INV O/P CURRENT) x 1.25 / A.T.F / G.F ...NEC 690.8(B) = [(12 x 1.21) x 1.25] / [0.91 x 0.8] = 24.93A SELECTED CONDUCTOR - #12 THWN-2...NEC 310.15(B)(16)

(B) AFTER IQ COMBINER PANEL TEMPERATURE DERATE FACTOR - 0.91 GROUPING FACTOR - 1

CONDUCTOR AMPACITY

= (TOTAL INV O/P CURRENT) x 1.25 / 0.91/ 1 ...NEC 690.8(B)

= [(34 x 1.21) x 1.25] / [0.91 x 1]

= 56.51 A

SELECTED CONDUCTOR - #6THWN-2 ... NEC 310.15(B)(16)

- 2. <u>PV OVER CURRENT PROTECTION</u> ... NEC
- = TOTAL INVERTER O/P CURRENT x 1.25
- = (34 x 1.21) x 1.25 = 51.43 A
- SELECTED OCPD = 60 A ...NEC 240.6

3 .<u>120% RULE FOR BACKFEED BREAKER</u>

..NEC 705.12(I

MCB + PV BREAKER <= (1.2 x BU RATING RATING RAT (200 + 60) <= 1.2 x 225 260.00 <= 270.00 H

	CONTRACTOR			
	SUI	NPR	1 120021	
	MAN	22171 MCH RD DEVILLE, LA 70471 ONE: 9152011490		
		SYSTEM SIZE:		
		ZE: 12.410 KW DC-(STC	;)	
		ZE: 9.860 KW AC	_	
		AR NAME & ADDRESS		
690.9(B)		ON JAMES		
	134 SOUTHERN PL,LILLINGTON, NC 27546,USA			
	REVISIONS			
	REV	DESCRIPTION		
			_	
	DRAWN DATE	8 7/14/2021 BVP		
B)(2)(3)(b)	REVIEWED BY			
	Signature with Seal			
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	1		_	
	ELECTRICA	AL CALCULATION	S	
		AL CALCULATION	S	

WARNING: PHOTOVOLTAIC **POWER SOURCE**

LABEL 1 ON ALL CONDUITS SPACED AT MAX 10FT

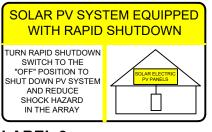
! WARNING ! ELECTRIC SHOCK HAZARD DO NOT TOUCH TERMINALS. INALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 5 AT EACH AC DISCONNECT

! CAUTION ! **SOLAR POINT OF INTERCONNECTION**



LABEL 2 AT INVERTER



LABEL 3 AT INVERTER



LABEL 4 AT DC DISCONNECT



LABEL 6 AT EACH AC DISCONNECT



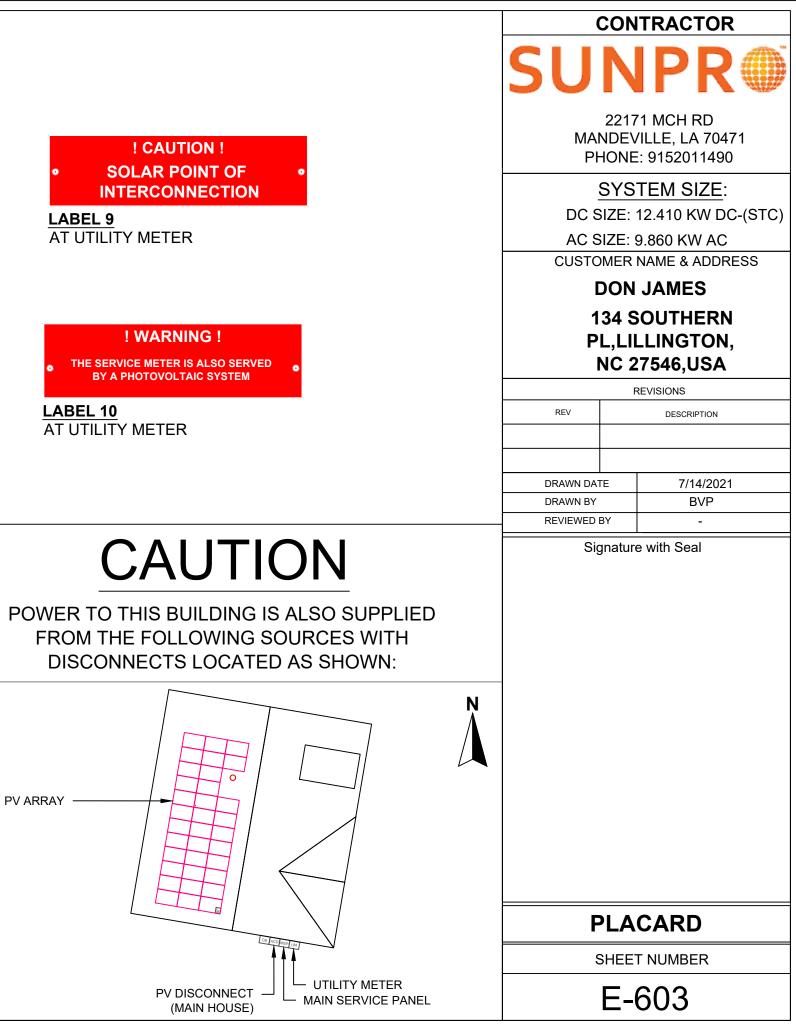
! WARNING !

DUAL POWER SOURCES SECOND SOURCE IS PV SYSTEM

LABEL 7 AT MEP

> **! WARNING !** SOLAR SYSTEM CONNECTED AND ENERGIZED

LABEL 8 AT MEP



LG NeON[®]2

LG365N1C-A6

365W

The LG NeON[®] 2 is LG's best selling solar module and one of the most powerful and versatile modules on the market today. The cells are designed to appear all-black at a distance, and the performance warranty guarantees 90.6% of labeled power output at 25 years.





Features



Enhanced Performance Warranty

LG NeON[®] 2 has an enhanced performance warranty. After 25 years, LG NeON® 2 is guaranteed at least 90.6% of initial performance.



Solid Performance on Hot Days

LG NeON[®] 2 performs well on hot days due to its low temperature coefficient.



25,00

Roof Aesthetics

LG NeON[®] 2 has been designed with aesthetics in mind using thinner wires that appear all black at a distance.

25-Year Limited Product Warranty

The NeON[®] 2 is covered by a 25-year limited

product warranty. In addition, up to \$450 of

a module needs to be repaired or replaced.

labor costs will be covered in the rare case that

When you go solar, ask for the brand you can trust: LG Solar

About LG Electronics USA, Inc.

LG Electronics is a global leader in electronic products in the clean energy markets by offering solar PV panels and energy storage systems. The company first embarked on a solar energy source research program in 1985, supported by LG Group's vaz experience in the semi-conductor, LCD, chemistry and materials industries. In 2010, LG Solar successfully released its first Monx\% energies to the market, which is now available in 32 countries. The NeoNox\% NeON\%, NeON\%, NeON\%2, NeON\%2, BiFacial won the "Intersolar AWARD" in 2013, 2015 and 2016, which demonstrates LG's leadership and innovation in the solar industry.



LG NeON[®]2

LG365N1C-A6

60

Cell Properties (Material/Type)	Monocrystalline/N-type
Cell Maker	LG
Cell Configuration	60 Cells (6 x 10)
Module Dimensions (L x W x H)	1,740mm x 1,042mm x 40mm
Weight	18.6 kg
Glass (Material)	Tempered Glass with AR Coating
Backsheet (Color)	White
Frame (Material)	Anodized Aluminium
Junction Box (Protection Degree)	IP 68 with 3 Bypass Diodes
Cables (Length)	1,100mm x 2EA
Connector (Type/Maker)	MC 4/MC

Certifications and Warranty

Certifications*	IEC 61215-1/-1-1/2: 2016, IEC 61730-1/2: 2016 UL 61730-1: 2017, UL 61730-2: 2017			
	ISO 9001, ISO 14001, ISO 50001			
	0HSAS 1800 1			
Salt Mist Corrosion Test	IEC 61701:2011 Severity 6			
Ammonia Corrosion Test	IEC 62716:2013			
Module Fire Performance	Type 1 (UL 617 30)			
Fire Rating	Class C (UL 790)			
Solar Module Product Warranty	25 Year Limited			
Solar Module Output Warranty	Linear Warranty*			

Temperature Characteristics

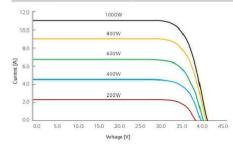
NMOT* [°C] 42 ± 3 Pmax -0.34 [%/°C] Voc [%/°C] -0.26 [%/°C] 0.03

*NMOT (Nominal Module Operating Temperature): Irradiance 800 W/m², Ambient temperature 20° Wind speed 1 m/s, Spectrum AM 1.5

Electrical Properties (NMOT)

Model		LG365N1C-A6		
Maximum Power (Pmax)	[W]	273.4		
MPP Voltage (Vmpp)	[V]	32.4		
VIPP Current (Impp)	[A]	8.44		
Open Circuit Voltage (Voc)	[V]	39.2		
Short Circuit Current (Isc)	[A]	9.06		

I-V Curves



_G

I G Electronics USA, Inc Colar Business Division 2000 Millbrook Drive Lincolnshire, IL 60069 Life's Good www.lg-solar.com

Electrical Properties (STC*)

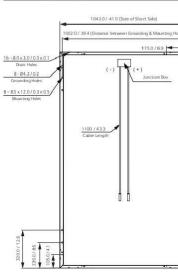
Model		L
Maximum Power (Pmax)	[W]	
MPP Voltage (Vmpp)	[V]	
MPP Current (Impp)	[A]	
Open Circuit Voltage (Voc, ± 5%)	[M]	
Short Circuit Current (lsc, ± 5%)	[A]	
Module Efficiency	[%]	
Bifaciality Coefficient of Power	[%]	
Power Tolerance	[%]	

Operating Temperature	[°C]	
Maximum System Voltage	[V]	
Maximum Series Fus e Rating	[A]	
Mechanical Test Load" (Front)	[Pa/psf]	
Mechanical Test Load' (Rear)	[Pa/psf]	

Packaging Configuration

ackaging conniguration		
Number of Modules per Pallet	[EA]	
Number of Modules per 40' Container	[EA]	
Number of Modules per 53' Container	[EA]	
Packaging Box Dimensions (L x W x H)	[mm]	1,79
Packaging Box Dimensions (Lx W x H)	[in]	70
Packaging Box Gross Weight	[kg]	
Packaging Box Gross Weight	[lb]	

Dimensions (mm/inch)



Product specifications are subject to change without notice. LG365N1C-A6.pdf 011821

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	CONTRACTOR			
	SUN	IPR		
	MANDE	171 MCH RD EVILLE, LA 70471 NE: 9152011490		
LG365N1C-A6	SY	STEM SIZE:		
365 34,5	DC SIZE	: 12.410 KW DC-(STC)		
10.58	AC SIZE	: 9.860 KW AC		
41.6	CUSTOMER NAME & ADDRESS			
20.1 10 0-+3	DO	N JAMES		
-40 ↔85 1,000 20	134 SOUTHERN PL,LILLINGTON, NC 27546,USA			
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	RESOURC	E DOCUMENT		
	SHE	ET NUMBER		
		004		
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Data Sheet Enphase Microinverters Region: AMERICAS

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready Enphase IQ 7 Micro[™] and Enphase IQ 7+ Micro[™] dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- · More than a million hours of testing
- · Class II double-insulated enclosure

UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and
- frequency ride-through requirements

 Remotely updates to respond to changing
- grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	1Q7-60-2-US		IQ7PLUS-72-2	IQ7PLUS-72-2-US		
Commonly used module pairings'	235 W - 350 W	235 W - 350 W +		235 W - 440 W +		
Module compatibility	60-cell PV mod	60-cell PV modules only		60-cell and 72-cell PV modules		
Maximum input DC voltage	48 V		60 V			
Peak power tracking voltage	27 V - 37 V					
Operating range	16 V - 48 V		27 V - 45 V 16 V - 60 V			
Min/Max start voltage	22 V / 48 V		22 V / 60 V			
Max DC short circuit current (module lsc)	15A		15 A			
Overvoltage class DC port	1		11			
DC port backfeed current	0 A		0 A			
PV array configuration	1 x 1 unaround	ed array; No additio	nal DC side protec	tion required;		
		tion requires max 20				
OUTPUT DATA (AC)	IQ 7 Microinv	IQ 7 Microinverter		IQ 7+ Microinverter		
Peak output power	250 VA		295 VA			
Maximum continuous output power	240 VA		290 VA			
Nominal (L-L) voltage/range®	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V		
Maximum continuous output current	1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)		
Nominal frequency	60 Hz		60 Hz			
Extended frequency range	47 - 68 Hz		47 - 68 Hz			
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms			
Maximum units per 20 A (L-L) branch circuit*	16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)		
Overvoltage class AC port	III		111			
AC port backfeed current	0 A		0 A			
Power factor setting	1.0		1.0			
Power factor (adjustable)	0.85 leading	0.85 lagging	0.85 leading 0.85 lagging			
EFFICIENCY	@240 V	@208 V	@240 V	@208 V		
Peak efficiency	97.6%	97.6 %	97.5 %	97.3 %		
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %		
MECHANICAL DATA	100000000000000000000000000000000000000				_	
Ambient temperature range	-40°C to +65°C	1				
Relative humidity range	4% to 100% (co	ndensing)				
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphe	anol H4 UTX with a	ditional Q-DCC-5	idapter)		
Dimensions (WxHxD)	the concernence of the second second	nm x 30.2 mm (with				
Weight	1.08 kg (2.38 lb	s)				
Cooling	Natural convect	tion - No fans				
Approved for wet locations	Yes					
Pollution degree	PD3					
Enclosure	Class II double-	insulated, corrosio	n resistant polyme	ric enclosure		
Environmental category / UV exposure rating	NEMA Type 6 /					
FEATURES	NEWIA Type 07	0010001			-	
Communication	Power Line Cor	nmunication (PLC)			_	
Monitoring		iger and MyEnlighte	n monitorina optic	0.2		
Montoning		quire installation of				
Disconnecting means	The AC and DC	connectors have be			U	
Compliance	disconnect required by NEC 690. GA Rule 21 (UL 1741-SA) UL 62109-7, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and confor NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of and DC conductors, when installed according manufacturer's instruction			mof		

No enforced DC/AC ratio. See the compatibility calculator at <u>https://enphase.com/en-us/support/module-compatibility.</u>
 Nominal voltage range can be extended beyond nominal if required by the utility.
 Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

a contra may fact, nere to recar requirementa to actine the names of micrometricity per availant

To learn more about Enphase offerings, visit enphase.com

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	CONTRACTOR		
	CONTRACTOR		
	SUN		
	MANDEV	71 MCH RD /ILLE, LA 70471 :: 9152011490	
	SYS	TEM SIZE:	
	DC SIZE:	12.410 KW DC-(STC)	
		9.860 KW AC	
	CUSTOMER NAME & ADDRESS		
	DON JAMES		
)	134 SOUTHERN PL,LILLINGTON, NC 27546,USA		
	F	REVISIONS	
	REV	DESCRIPTION	
	DRAWN DATE	7/14/2021	
	DRAWN BY	BVP	
	REVIEWED BY	-	
	Signature with Seal		
1			
for use as the load-break			
s B,			
forms with NEC-2014 and wn of PV Systems, for AC stions.			
ENPHASE.			
	RESOURCE		
	SHEET NUMBER		
	R-002		
	1		

Data Sheet Enphase Networking

Enphase IQ Combiner 3 (X-IQ-AM1-240-3)

The Enphase IQ Combiner 3™ with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring

Simple

- Reduced size from previous combiner
- Centered mounting brackets support single stud mounting
- · Supports back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC
- plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type
- 3R enclosure
- Five-year warranty
- UL listed



Enphase IQ Combiner 3

MODEL NUMBER IQ Combiner 3 X-IQ-AM1-240-3 IQ Combiner 3 with Enphase IQ Envoy* printed circuit board for integr production metering (ANSI C12.20 +/- 0.5%) and optional* consumpti-ACCESSORIES and REPLACEMENT PARTS (not included, order separately) Enphase Mobile Connect[®] CELLMODEM-03 (4G / 12-year data plan) Plug and play industrial grade cellular modem with data plan for syste microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and CELLMODEM-01 (3G / 5-year data plan) microinverters. (Available in the US, Canada, Mexico, Puerto Rico, CELLMODEM-01 (4G based LTE-M / 5-year data plan) where there is adequate cellular service in the installation area.) Consumption Monitoring* CT CT-200-SPLIT Split core current transformers enable whole home consumption met **Circuit Breakers** Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR BRK-10A-2-240 Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 BRK-15A-2-240 BRK-20A-2P-240 Circuit breaker, 2 pole, 20A, Eaton BR220 EPLC-01 Power line carrier (communication bridge pair), quantity 2. XA-PLUG-120-3 Accessory receptacle for Power Line Carrier in IQ Combiner 3 (require XA-ENV-PCBA-3 Replacement IQ Envoy printed circuit board (PCB) for Combiner 3 ELECTRICAL SPECIFICATIONS Rating Continuous duty System voltage 120/240 VAC, 60 Hz 125 A Eaton BR series busbar rating Max. continuous current rating (output to grid) 65 A Max. fuse/circuit rating (output) 90 A Branch circuits (solar and/or storage) Up to four 2-pole Eaton BR series Distributed Generation (DG) breake Max. continuous current rating (input from PV) 64 A Max. total branch circuit breaker rating (input) 80A of distributed generation / 90A with IQ Envoy breaker included Production Metering CT 200 A solid core pre-installed and wired to IQ Envoy MECHANICAL DATA Dimensions (WxHxD) 49.5 x 37.5 x 16.8 cm (19.5" x 14.75" x 6.63"). Height is 21.06" (53.5 cm 7.5 kg (16.5 lbs) Weight -40° C to +46° C (-40° to 115° F) Ambient temperature range Natural convection, plus heat shield Cooling Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction Enclosure environmental rating + 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors Wire sizes 60 A breaker branch input: 4 to 1/0 AWG copper conductors Main lug combined output: 10 to 2/0 AWG copper conductors · Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing. To 2000 meters (6,560 feet) Altitude INTERNET CONNECTION OPTIONS 802.11b/g/n Integrated Wi-Fi Ethernet Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included) Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) or CELLMOD (not included) Cellular COMPLIANCE Compliance, Combiner UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production Compliance, IQ Envoy UL 60601-1/CANCSA 22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit enphase.com

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	CONTRACTOR		
	SUI	NPR	
	22171 MCH RD MANDEVILLE, LA 70471 PHONE: 9152011490		
ated revenue grade PV on monitoring (+/- 2.5%).	SYSTEM SIZE:		
rms up to 60	DC SIZE: 12.410 KW DC-(STC)		
I the US Virgin Islands,	AC SIZ	ZE: 9.860 KW AC	
ering (+/- 2.5%).	CUSTOMER NAME & ADDRESS		
260 circuit breakers.	DON JAMES		
ed for EPLC-01)	134 SOUTHERN PL,LILLINGTON, NC 27546,USA		
		REVISIONS	
	REV	DESCRIPTION	
s only (not included)			
	DRAWN DATE	7/14/2021	
	DRAWN BY	BVP	
with mounting brackets).	REVIEWED BY	ature with Seal	
ENPHASE.			
	RESOURCE DOCUMENT		
	SHEET NUMBER		
	R-003		

