TEC SOLAR
STRUCTURAL ENGINEERING
LICENSED IN 50 STATES

Structural Letter of Approval

July 9, 2025
Beam Solar Co
1231 Shields Road Ste. 5
Kernersville, NC 27284

Glenda Bellamy Residence: 239 Falling Water Rd, Spring Lake, NC 28390

Dear Sir/ Madam,
TEC Solar, PLLC has performed a structural evaluation for the roof of the structure referenced above based on its existing and proposed load conditions. The information used to evaluate this structure was gathered from the site visit documentation provided by the client (Beam Solar Co). The design criteria that the calculations are based on are located in the attached References page. The design of the solar panel's mounting hardware is provided by others.

Design Method

This engineering analysis was performed in accordance with ASCE 7-10 and 2018 North Carolina Residential Code (NCRC) design methods. In general, this design method is a comparison of the roof loads before and after the solar panel installation.

Results

The total additional roof load of the solar panels system is 3 psf, and the typical 20 psf live load will not be present in the area of the panels, as defined per R324.4.1 in 2018 NCRC. The total combined vertical loads are reduced when considering the worst-case load combination (ASD). Regarding lateral wind loads, the solar panel structure is considered to be partially enclosed due to the low profile of the panels (3 to 6 inches) and airflow restrictions below the panels caused by the pv frame, wiring, conduit, and frame brackets. Because the system is considered to be 'partially enclosed' additional wind pressure on the structure is considered negligible. The addition of total PV system weight results in an increase of under 10% of the total roof weight, and meets the seismic requirements in Section 403.4 of 2018 NCEBC. See the attached calculations for further details.

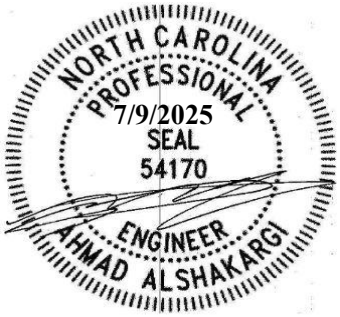
Conclusions

TEC Solar concludes that the installation of solar panels on existing roof will not affect the structure and allows it to remain unaltered under the applicable design standards. The calculations performed to support these conclusions are attached to this letter.

General Instructions

1. The contractor shall comply with all Federal, State, County, City, local and OSHA mandated regulations and requirements. The most stringent shall govern.
2. Contractor shall keep an accurate set of As-Built plans.
3. The solar panel's racking system and mounting hardware shall be mounted in accordance with the manufacturer's most current installation manual.
4. Connection: 5/16" lag screws 2.5" minimum penetration centered on truss top chord or rafter at 48" maximum spacing. Maximum overhang: 12".
5. Panel support connections shall be staggered to distribute load to adjacent trusses.
6. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
7. Structural observation or construction inspections will not be performed by TEC, Engineer-of-Record (EOR) nor their representatives.
8. TEC Solar assumes no responsibility for improper installation of the solar panels.

Best Regards,
TEC Solar, PLLC



Ahmad Alshakargi, PE
Civil (Structural) Engineer
Firm License P-3037

References

Design Parameter

Code: 2018 North Carolina Residential Code, ASCE 7-10
Risk Category: II
Ground Snow load: 10 psf
Roof Snow load: 6.9 psf
Design Wind Speed: 120 mph (3 sec gust) per ASCE 7-10
Existing roof dead load: 13.2 psf
Live Load: 20 psf (reducible where panels are located per R324.4.1 in 2018 NCRC).
Seismic Design Category: D2
Wind Exposure Category: C

Existing Roof Structure

Roof framing: 2x6 Rafters at 16” O.C.
Roof material: Composite shingles
Roof slope: 46°, 50°

Solar Panels

Weight: 3 psf

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Date: 7/9/2025
Client: Glenda Bellamy
Subject: Gravity load

Gravity load calculations

Snow load (S)	Existing	w/ solar panels	
Roof slope (°):	45	45	
Ground snow load, pg (psf):	10	10	ASCE 7-10, Section 7.2
Terrain category:	C	C	ASCE 7-10, table 7-2
Exposure of roof:	Fully exposed	Fully exposed	ASCE 7-10, table 7-2
Exposure factor, Ce:	0.9	0.9	ASCE 7-10, table 7-2
Thermal factor, Ct:	1.1	1.1	ASCE 7-10, table 7-3
Risk Category:	II	II	ASCE 7-10, table 1.5-1
Minimum roof snow load, Pm, per ASCE 7-16 Section 7.3.4: Is.Pg (where Pg is <= 20 psf), 20.Is (where Pg is > 20psf), Minimum roof snow load			
Importance Factor, Is:	1	1	ASCE 7-10, table 1.5-2
Flat roof snow load, pf (psf):	6.9	6.9	ASCE 7-10, equation 7.3-1
Minimum roof snow load, pm (psf):	20	20	ASCE 7-10, equation 7.3-4
Roof Surface type:	Other	Unobstructed slippery surface	ASCE 7-10, Section 7.4
Roof slope factor, Cs:	1	0.42	ASCE 7-10, figure 7-2b
$p_s = C_s p_f$ (7.4-1)			ASCE 7-10, equation 7.4-1 Design
Sloped roof snow load, ps [psf]:	6.9	2.9	Snow Load (S)

Roof dead load (D)					
Roof pitch/12	12.0				
Composite shingles	3	psf	1/2" Gypsum clg.	0	psf
1/2" plywood	1.5	psf	insulation	0.8	psf
Framing	3	psf	M, E & Misc	1	psf
Roof DL without PV arrays	13.2	psf			
PV Array DL	3	psf			

Roof live load (Lr)	Existing	w/ solar panels	
Roof Live Load	20	0	R324.4.1 in 2018 NCRC

ASD Load combination:

	Existing	With PV array	
D [psf]	13.2	16.2	ASCE 7-10, Section 2.4.1
D+L [psf]	13.2	16.2	ASCE 7-10, Section 2.4.1
D+[Lr or S or R] [psf]	33.2	19.1	ASCE 7-10, Section 2.4.1
D+0.75L+0.75[Lr or S or R] [psf]	28.2	18.4	ASCE 7-10, Section 2.4.1
Maximum gravity load [psf]:	33.2	19.1	
Ratio proposed load to existing load:		57.56%	

The stresses due to gravity load in the area of the solar panels is reduced, allowing the structure to remain unaltered.

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Date: 7/9/2025
Client: Glenda Bellamy
Subject: Wind load and Connection

Wind Pressure Calculations

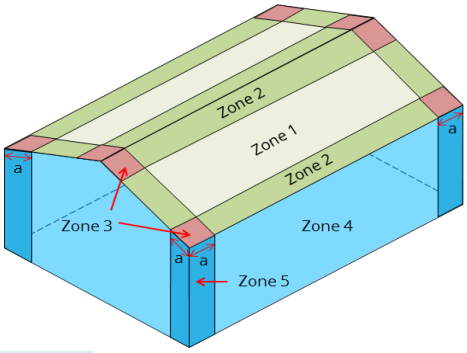
$$p = q_p((GC_p) - (GC_{pi})) \qquad (30.9\text{-}1)$$

Basic wind speed (mph)	120			
Risk category	II			
Exposure category	C			
Roof type	Gable			
Figure for GCp values	ASCE 7-10 Figure 30.3-2A-I			
	Zone 1	Zone 2	Zone 3	
GCp (neg)	-1	-1.2	-1.2	
GCp (pos)	0.9	0.9	0.9	
zg (ft)	900	(ASCE 7-10 Table 26.11-1)		
α	9.5	(ASCE 7-10 Table 26.11-1)		
Kzt	1	(ASCE 7-10 Equation 26.8-1)		(only changes if structure located on a hill or ridge)
Kh	0.94	(ASCE 7-10 Table 26.10-1)		
Kd	0.85	(ASCE 7-10 Table 26.6-1)		
Velocity Pressure,qh (psf)	29.45	(ASCE 7-10 Equation 26.10-1)		
Gcpi	0	(ASCE 7-10 Table 26.13-1)		

	Zone 1	Zone 2	Zone 3
W Pressure, (neg) [psf]	-29.45	-35.35	-35.35
W Pressure, (pos) [psf]	26.51	26.51	26.51
W Pressure, (Abs. max) [psf]	29.45	35.35	35.35

Connection Calculations (Lag bolts)

Lag screw diameter: 5/16



Capacity

Connection type:	Lag screw		
Embedment (in):	2.5		
Framing grade:	DFL#2	G:	0.5
Capacity [lbs/in]:	266	(2018 NDS table 12.2A)	
Number of screws:	1		
Total capacity [lbs]:	665.00		

Demand

Anchor spacing:		48	in
Anchor spacing in roof corners:		48	in

Zone	(0.6 W Pressure, psf), see Note 1	Max. tributary area (ft^2)	Max Uplift force (lbs)
1	17.7	11	194.4
2	21.2	11	233.3
3	21.2	11	233.3

Connection Meets Demand

Note 1: 0.6W results from dominant ASD combo [0.6D+ 0.6W] (ASCE 7-10 2.4.1).

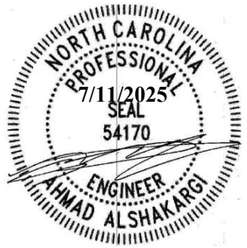
NEW PHOTOVOLTAIC ROOF MOUNTED SYSTEM

AHJ
HARNETT COUNTY

UTILITY
SOUTH RIVER ELECTRIC MEMBERSHIP CORPORATION

SCOPE OF WORK
(N) 7.380 kW DC/ **5.220** kW AC ROOF MOUNTED PV SYSTEM
(N) (18) QCELLS Q.PEAK DUO BLK ML-G10.C+ (DOM) (410W) MODULES
(N) (18) ENPHASE IQ8PLUS-72-2-US [240V] MICROINVERTER(S)

CODES AND STANDARDS
2017 NATIONAL ELECTRICAL CODE
2018 NORTH CAROLINA BUILDING CODE
2018 NORTH CAROLINA RESIDENTIAL CODE
2018 NORTH CAROLINA FIRE CODE
AS ADOPTED BY HARNETT COUNTY



TEC Solar, PLLC
8470 W Magna Main St Unit 311, Magna, UT 84044
North Carolina Firm License P-3037

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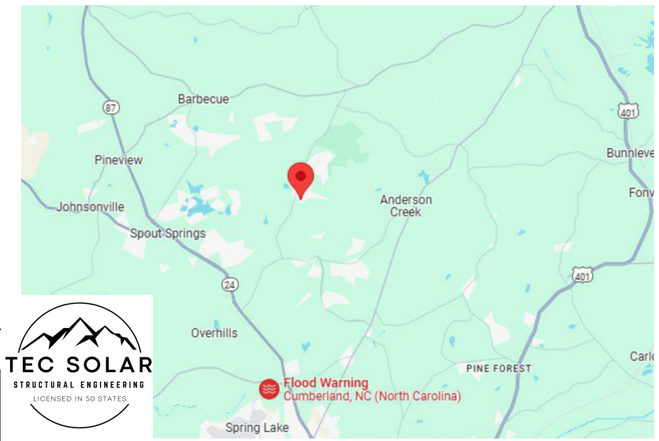
VICINITY MAP



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GENERAL NOTES

1.1.1 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE RELEVANT YEAR OF THE NATIONAL ELECTRIC CODE (NEC), ALL MANUFACTURER'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.

1.1.2 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND THE PV SYSTEM MUST BE INSPECTED PRIOR TO OPERATION

1.1.3 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 AND OTHER GOVERNING CODES

1.1.4 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

STRUCTURAL NOTES

1.2.1 ALL SOLAR PANEL COMPONENTS SHALL BE INSTALLED PER THE MANUFACTURER'S APPROVED INSTALLATION SPECIFICATIONS.

1.2.2 THE EXISTING BUILDING'S STRUCTURE SHALL BE VERIFIED AS PROPERLY CONSTRUCTED AND MAINTAINED IN GOOD CONDITION. NO ALLOWANCE HAS BEEN MADE FOR ANY EXISTING DEFICIENCY IN DESIGN, MATERIAL, CONSTRUCTION, OR LACK OF MAINTENANCE FOR THE EXISTING STRUCTURE OR PROPOSED EQUIPMENT. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS, PROPER FIT, AND CLEARANCES IN THE FIELD.

1.2.3 IF ANY CONDITION THROUGHOUT THE ASSOCIATED REPORT OR PERMIT DRAWINGS OS NOT REPRESENTED ON-SITE, CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD (EOR) OF ANY DISCREPANCIES AND RECEIVE WRITTEN APPROVAL FROM THE EOR BEFORE PROCEEDING WITH INSTALLATION.

1.2.4 MISCELLANEOUS ITEMS NOT EXPLICITLY NAMED AND SHOWN IN THESE DRAWINGS HAVE NOT BEEN DESIGNED. IT IS RECOMMENDED THAT MATERIAL OF SUITABLE SIZE & STRENGTH BE OBTAINED FROM A REPUTABLE MANUFACTURER FOR MISCELLANEOUS ITEMS.

1.2.5 CONTRACTOR SHALL BE RESPONSIBLE TO COMPLETE, SEAL, AND WATERPROOF ROOFTOP PENETRATION FOR SOLAR RACKING.

1.2.6 CONTRACTOR TO PROVIDE MINIMUM 1/4" GAP BETWEEN ALL SOLAR PANELS.

1.2.7 PROJECT WINDSPEED IS BASIC WIND SPEED PER CODE UNLESS NOTED OTHERWISE.

SHEET INDEX

LGCY POWER

LEGACY INSTALLATION SERVICES, LLC

3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-353-4899

QUALIFIER #: U.13732
ELECTRICAL LIC#: U.34989

NEW PHOTOVOLTAIC ROOF MOUNTED SYSTEM

GLENDA BELLAMY
239 FALLING WATER RD,
SPRING LAKE, NC 28390
7.380 kW DC/ **5.220** kW AC ROOF MOUNTED PV SYSTEM

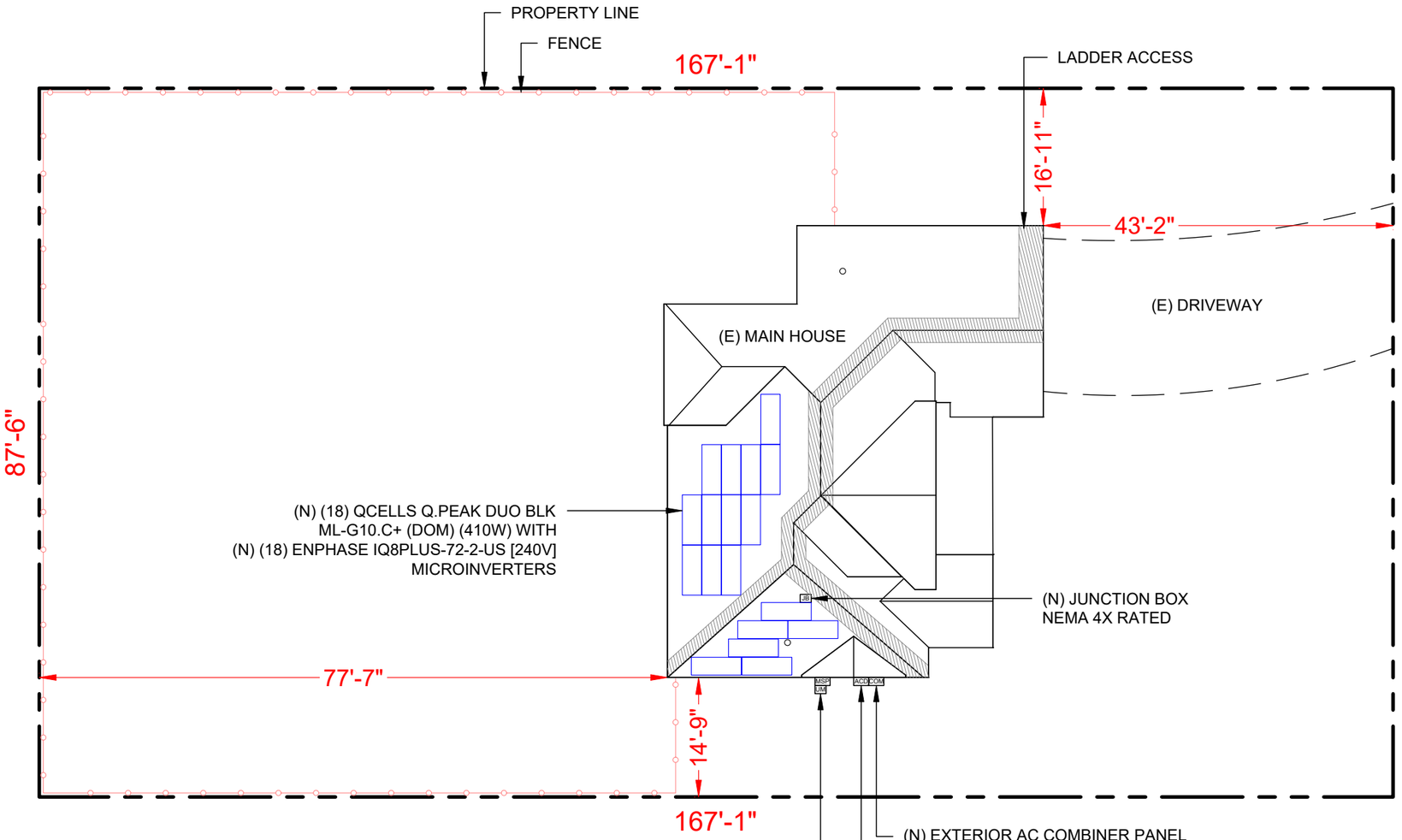
PROJECT ID	N/A
DATE	11 July 2025
CREATED BY	RG
SIGNATURE	

COVER SHEET

PV-1

(N) 7.380 kW DC / **5.220** kW AC ROOF MOUNTED PV SYSTEM
(N) (18) QCELLS Q.PEAK DUO BLK ML-G10.C+ (DOM) (410W) MODULES
(N) (18) ENPHASE IQ8PLUS-72-2-US [240V] MICROINVERTER(S)
TOTAL ROOF AREA: **3157.97** SQ FT.
TOTAL ARRAY AREA: **380.44** SQ FT.
TOTAL COVERAGE % : **12.05** %

VISIBLE, LOCKABLE, LABELED DISCONNECT WITHIN 10' OF SOUTH RIVER ELECTRIC MEMBERSHIP CORPORATION UTILITY METER #14458101



LEGEND

- FIRE PATHWAYS (36" / 18")
- FENCE
- PROPERTY LINE
- JB — JUNCTION BOX
- VENT, ATTIC FAN (ROOF OBSTRUCTIONS)

N

SCALE: 1/16" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 54170 ENGINEER AHMAD ALSHAKARGI 7/11/2025

TEC Solar, PLLC
8470 W Magna Main St Unit 311, Magna, UT 84044
North Carolina Firm License P-3037

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PLOT PLAN

PV-2

(N) 7.380 kW DC / **5.220** kW AC ROOF MOUNTED PV SYSTEM
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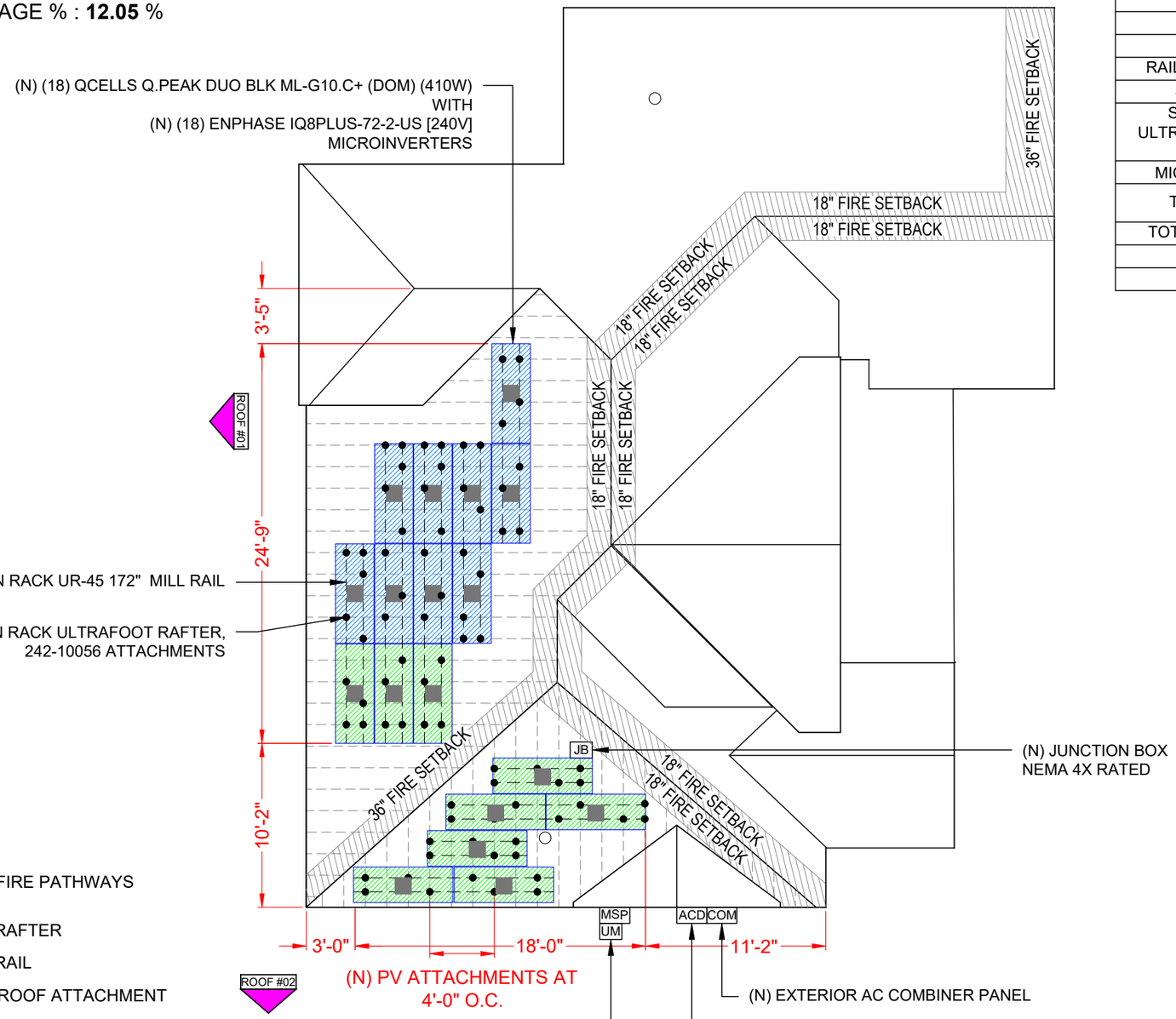

LEGEND

- FIRE PATHWAYS (36" / 18")
- RAFTER
- RAIL
- ROOF ATTACHMENT
- JB — JUNCTION BOX
- VENT, ATTIC FAN (ROOF OBSTRUCTIONS)

N

SCALE: 1/8"=1'-0"

DEAD LOAD CALCULATIONS

BOM	QUANTITY	LBS/UNIT	TOTAL WEIGHT (LBS)
MODULES	**18**	48.5	873.0
MID-CLAMP	18	0.150	2.7
END-CLAMP	36	0.020	0.7
RAIL LENGTH (172")	16	5.55	88.8
SPLICE BAR	4	0.52	2.1
SNAP N RACK ULTRAFOOT RAFTER, 242-10056	79	1.5	118.5
MICROINVERTER	**18**	2.38	42.8
TOTAL WEIGHT OF THE SYSTEM (LBS)			1128.6
TOTAL ARRAY AREA ON THE ROOF (SQ.FT.)			380.44
WEIGHT PER SQ.FT. (LBS)			2.97
WEIGHT PER PENETRATION (LBS)			14.29

FALLING WATER RD

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NORTH CAROLINA PROFESSIONAL 7/11/2025 SEAL 54170 ENGINEER AHMAD ALSHAKARGI

TEC Solar, PLLC
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CIRCUIT(S)

- CIRCUIT #1 - 09 MODULES
- CIRCUIT #2 - 09 MODULES

ROOF SECTIONS

ROOF #01
MODULE - 12
SLOPE - 46°
AZIMUTH - 271°
MATERIAL - COMP. SHINGLE
RAFTER SIZE & SPACING - 2"X6" @ 16" O.C.

ROOF #02
MODULE - 06
SLOPE - 50°
AZIMUTH - 181°
MATERIAL - COMP. SHINGLE
RAFTER SIZE & SPACING - 2"X6" @ 16" O.C.

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7.380 kW DC/ **5.220** kW AC ROOF MOUNTED PV SYSTEM

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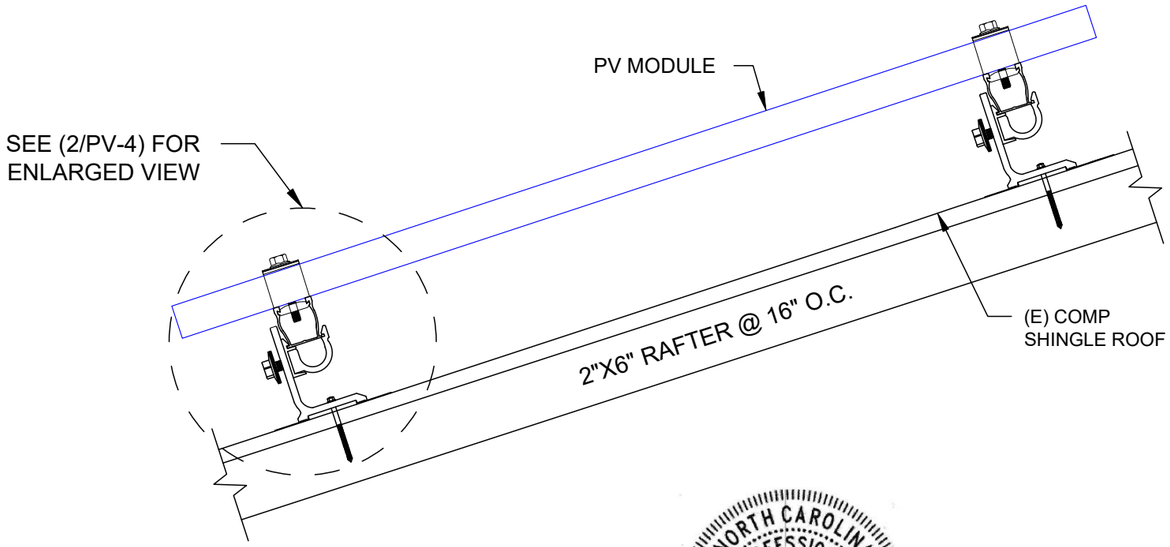
SITE PLAN

PV-3

GENERAL STRUCTURAL NOTES:

1. THE SOLAR PANELS ARE TO BE MOUNTED TO THE ROOF FRAMING USING THE USING SNAP N RACK UR-45 172" MILL SYSTEM WITH SNAP N RACK ULTRAFOOT RAFTER, 242-10056 ATTACHMENTS.
2. THE MOUNTING FEET ARE TO BE SPACED AS SHOWN IN THE DETAILS, AND MUST BE STAGGERED TO ADJACENT FRAMING MEMBERS TO SPREAD OUT THE ADDITIONAL LOAD.
3. THE PROPOSED PV SYSTEM ADDS 2.97 PSF TO THE ROOF FRAMING SYSTEM.
4. ROOF LIVE LOAD = 20 PSF TYPICAL, 0 PSF UNDER NEW PV SYSTEM.
5. GROUND SNOW LOAD = 10 PSF
6. WIND SPEED = 118 MPH
7. EXPOSURE CATEGORY = C
8. RISK CATEGORY = II
9. MAX OVER HANG RAIL =1'-6"



1 PV-4 ATTACHMENT DETAIL (SIDE VIEW)

SCALE: NTS

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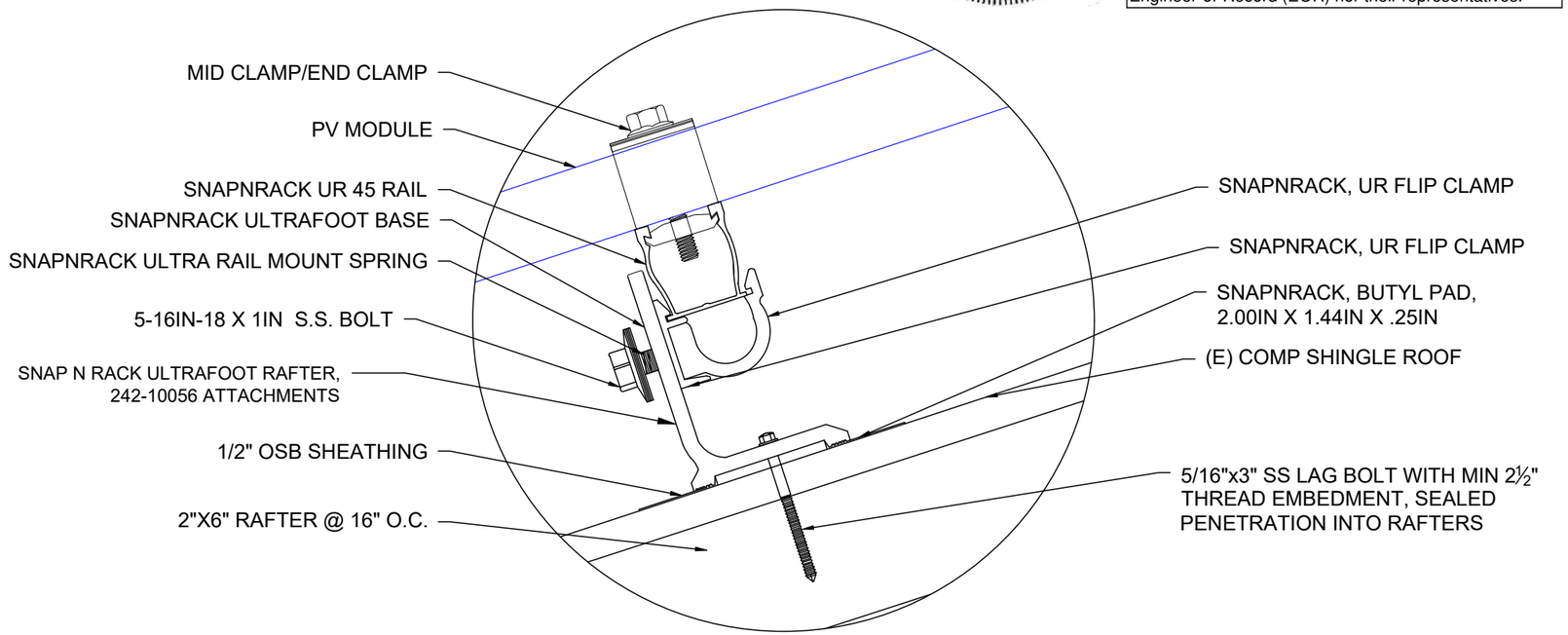

2 PV-4 ATTACHMENT DETAIL ENLARGED VIEW

SCALE: NTS

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STRUCTURAL

PV-4

CONDUCTOR SCHEDULE

TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(2) 12 AWG Q-CABLE	NONE	(1) 6 AWG BARE COPPER, EGC
2	3/4" EMT	(4) 10 AWG THWN-2, (Cu)	NONE	(1) 10 AWG THWN-2, EGC
3	3/4" EMT	(2) 10 AWG THWN-2, (Cu)	(1) 10 AWG THWN-2, (Cu)	(1) 10 AWG THWN-2, EGC

NORTH CAROLINA PROFESSIONAL SEAL 54170 ENGINEER AHMAD ALSHAKARGI 7/11/2025

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Installer must coordinate metering with electric utility and all electrical installation requirements with local AHJ. Mounting hardware is provided by manufacturer and is not in scope of this review.

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PHOTOVOLTAIC SYSTEM	
DC SYSTEM SIZE (WATTS)	7380W
AC SYSTEM SIZE (WATTS)	5220W
TOTAL NUMBER OF MODULES	18
NOMINAL AC VOLTAGE	240V

(N) MODULE: (18) QCELLS Q.PEAK DUO BLK ML-G10.C+ (DOM) (410W)
(N) INVERTER: (18) ENPHASE IQ8PLUS-72-2-US [240V]

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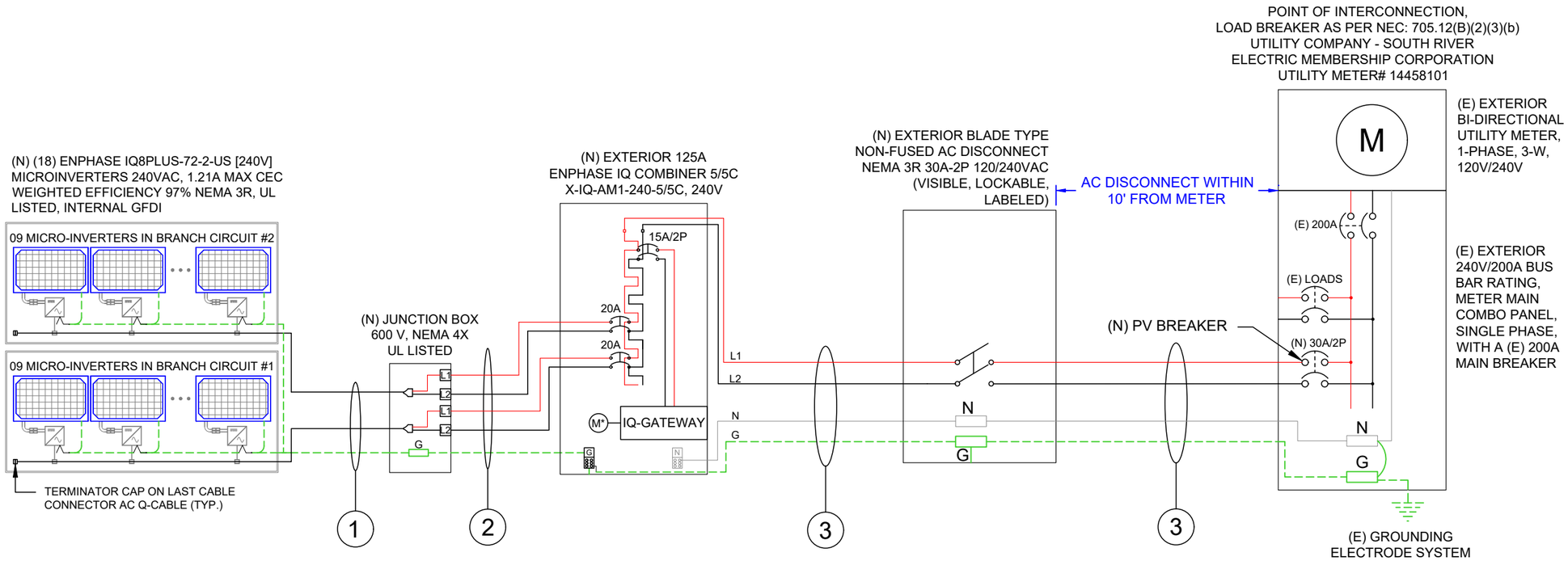

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THREE LINE DIAGRAM

PV-5

INVERTER SPECIFICATIONS	
MANUFACTURER	ENPHASE IQ8PLUS-72-2-US [240V]
MAX. DC VOLT RATING	60 VOLTS
MAX. POWER AT 40 C	290 WATTS
NOMINAL AC VOLTAGE	240 VOLTS
MAX. AC CURRENT	1.21 AMPS
MAX. OCPD RATING	20 AMPS
MAX. PANELS/CIRCUIT	13
SHORT CIRCUIT CURRENT	25 AMPS

PV MODULE RATING @ STC	
MANUFACTURER	QCELLS Q.PEAK DUO BLK ML-G10.C+ (DOM) (410W)
MAX. POWER-POINT CURRENT (IMP)	10.89 AMPS
MAX. POWER-POINT VOLTAGE (VMP)	37.64 VOLTS
OPEN-CIRCUIT VOLTAGE (VOC)	45.37 VOLTS
SHORT-CIRCUIT CURRENT (ISC)	11.20 AMPS
NOM. MAX. POWER AT STC (PMAX)	410 WATT
MAX. SYSTEM VOLTAGE	1000V
VOC TEMPERATURE COEFFICIENT	-0.27 %/K

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TEC SOLAR
STRUCTURAL ENGINEERING
LICENSED IN 50 STATES

120% RULE
(BUS BAR RATING X 120%) - MAIN BREAKER RATING = MAX. PV OCPD
(200A x 120%) - 200A = 40A

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-10°C
AMBIENT TEMP (HIGH TEMP 2%)	36°C
CONDUIT HEIGHT	7/8"
ROOF TOP TEMP	58°C
CONDUCTOR TEMPERATURE RATE	75°C

ELECTRICAL WIRE CALCULATION

WIRE TAG #	WIRE QTY	WIRE GAUGE:	TEMP RATING:	WIRE AMP		TEMP DE-RATE:		CONDUIT FILL:		WIRE AMP:	INVERTER QTY:		NOC:		NEC:		STRING AMPS
1	2	#12	75°	25A	x	0.88	x	N/A	=	22.00A	09	x	1.21A	x	1.25	=	13.61A
2	4	#10	75°	35A	x	0.88	x	0.80	=	24.64A	09	x	1.21A	x	1.25	=	13.61A
3	3	#10	75°	35A	x	0.88	x	1.00	=	30.80A	18	x	1.21A	x	1.25	=	27.23A

LGCY POWER

LEGACY INSTALLATION SERVICES, LLC
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-353-4899

QUALIFIER #: U.13732
ELECTRICAL LIC#: U.34989

NEW PHOTOVOLTAIC ROOF MOUNTED SYSTEM

GLENDA BELLAMY
239 FALLING WATER RD,
SPRING LAKE, NC 28390
7.380 kW DC/ **5.220** kW AC ROOF MOUNTED PV SYSTEM

PROJECT ID	N/A
DATE	11 July 2025
CREATED BY	RG
SIGNATURE	

WIRE CALCULATION

PV-5.1

GENERAL NOTES

SITE NOTES

2.1.1 A LADDER WILL BE IN PLACE FOR INSPECTION IN ACCORDANCE WITH OSHA REGULATIONS.
2.1.2 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
2.1.3 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
2.1.4 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED IN ACCORDANCE WITH SECTION NEC 110.26.
2.1.5 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

EQUIPMENT LOCATIONS

2.2.1 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS IN ACCORDANCE WITH NEC 110.26.
2.2.2 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLE 310.15 (B)(2)(a) AND 310.15 (B)(3)(a).
2.2.3 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES IN ACCORDANCE WITH NEC 690.34.
2.2.4 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.
2.2.5 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL IN ACCORDANCE WITH NEC APPLICABLE CODES.
2.2.6 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

STRUCTURAL NOTES

2.3.1 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED IN ACCORDANCE WITH THE CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, IN ACCORDANCE WITH RAIL MANUFACTURER'S INSTALLATION PRACTICES.
2.3.2 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
2.3.3 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
2.3.4 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER OR PROFESSIONAL ENGINEERING GUIDANCE.
2.3.5 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

WIRING & CONDUIT NOTES

2.4.1 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
2.4.2 CONDUCTORS SIZED IN ACCORDANCE WITH THE NEC
2.4.3 AC CONDUCTORS TO BE COLORED OR MARKED PER NEC
2.4.4 LISTED OR LABELED EQUIPMENT SHALL BE INSTALLED AND USED IN ACCORDANCE WITH ANY INSTRUCTIONS INCLUDED IN THE LISTING OR LABELING PER NEC

GROUNDING NOTES

2.5.1 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
2.5.2 PV EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH NEC 690.43 AND NEC TABLE 250.122.
2.5.3 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORDANCE WITH NEC 250.134 AND 250.136(A).
2.5.4 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH NEC 690.45 AND INVERTER MANUFACTURER'S INSTALLATION PRACTICES
2.5.5 EACH MODULE WILL BE GROUNDED AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. 2.5.6 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
2.5.7 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER PER NEC 250.119
2.5.8 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED IN ACCORDANCE WITH NEC 250, NEC 690.47 AND THE AHJ.
2.5.9 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

DISCONNECTION AND OVERCURRENT PROTECTION NOTES

2.6.1 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (ALWAYS BE CONNECTED TO THE UPPER TERMINALS).
2.6.2 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
2.6.3 PV SYSTEM CIRCUITS INSTALLED ON OR IN HABITABLE BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12
2.6.4 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.
2.6.5 INVERTER ON-GRID BRANCHES SHALL BE CONNECTED TO A SINGLE BREAKER OR GROUPED FUSE DISCONNECT(S) IN ACCORDANCE WITH NEC 110.3(B).
2.6.6 IF REQUIRED BY THE AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION IN ACCORDANCE WITH NEC 690.11 AND UL1699B.

INTERCONNECTION NOTES

2.7.1 LOAD SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH NEC 705.12(B)
2.7.2 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120 PERCENT OF BUSBAR RATING PER NEC 705.12(B)(2)(3)(b)
2.7.3 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 IN ACCORDANCE WITH NEC 705.12(B)(2)(3)(b)
2.7.4 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT PROTECTION DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE MAIN OVERCURRENT PROTECTION DEVICE MAY BE EXCLUDED IN ACCORDANCE WITH NEC 705.12(B)(2)(3)(c).
2.7.5 FEEDER TAP INTERCONNECTION (LOAD SIDE) IN ACCORDANCE WITH NEC 705.12(B)
2.7.6 SUPPLY SIDE TAP INTERCONNECTION IN ACCORDANCE WITH TO NEC 705.12(A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42.
2.7.7 BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING PER NEC 705.12(B)

NORTH CAROLINA PROFESSIONAL 7/11/2025 SEAL 54170 ENGINEER AHMAD ALSHAKARGI

TEC SOLAR STRUCTURAL ENGINEERING LICENSED IN 50 STATES

TEC Solar, PLLC
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CREATED BY	RG
SIGNATURE	

NOTES

PV-6

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

PER CODE(S): NEC 2017: 690.13(B)

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

LABEL LOCATION:
INVERTER(S), AC DISCONNECT(S), AC COMBINER PANEL (IF APPLICABLE).
PER CODE(S): NEC 2017: 690.17(4)

WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

POINT OF INTERCONNECTION
NEC 705.12(D)(3) & NEC 690.64

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

LABEL LOCATION:
UTILITY SERVICE ENTRANCE/METER, INVERTER/DC DISCONNECT IF REQUIRED BY LOCAL AHJ, OR OTHER LOCATIONS AS REQUIRED BY LOCAL AHJ.
PER CODE(S): NEC 2017: ARTICLE 690.56(C)

PV ARRAY

J/B

WARNING: PHOTOVOLTAIC POWER SOURCE

(PER CODE: NEC 690.31(G)(3)(4) & NEC 690.13(G)(4))

M

A C

COMBINER BOX

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

PER CODE(S): NEC 2017: 705.12(B)(2)(3)(b):

EMERGENCY DISCONNECT
SERVICE DISCONNECT

LABEL LOCATION: MAIN SERVICE DISCONNECT, NEC 2017, 690.13(B)

PHOTOVOLTAIC AC DISCONNECT

(PER CODE: NEC 690.14 (C) (1))

SOLAR PHOTOVOLTAIC SYSTEMS

(PER CODE: NEC 690)

PHOTOVOLTAIC SYSTEM AC DISCONNECT
RATED AC OPERATING CURRENT 21.78 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.54)

WARNING
THIS EQUIPMENT IS FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR

PER NEC 705.12(B)(2)(3)(c)

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

SOLAR ELECTRIC PV PANELS

AT INVERTER [IFC 605.11.3.1(1) & 690.56(C)(1)(a)]
PER CODE: NEC 2017

SOLAR PHOTOVOLTAIC SYSTEMS

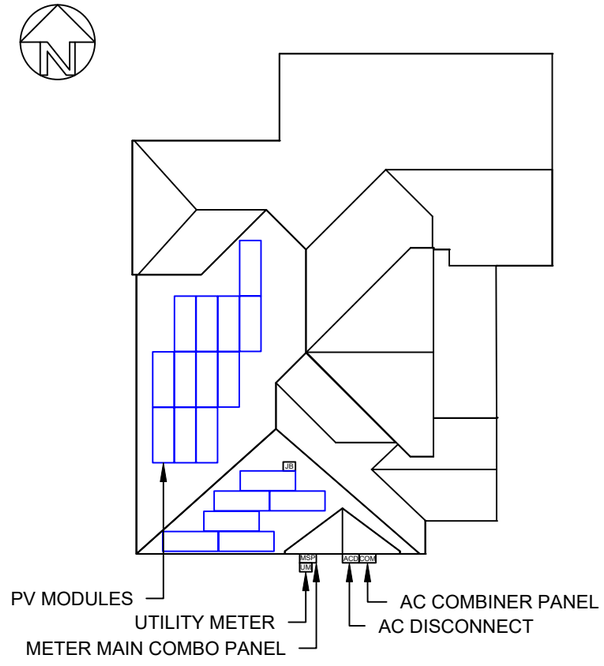
(PER CODE: NEC 690)

SOLAR PHOTOVOLTAIC SYSTEMS

(PER CODE: NEC 690)

CAUTION:
MULTIPLE SOURCES OF POWER

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECT(S) LOCATED AS SHOWN.
DANGEROUS VOLTAGE MAY BE PRESENT AT ALL TIMES



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LABELS

PV-7

LGCY POWER

FIELD DESIGN REQUEST FORM

JOB INFORMATION

JOB NAME: | DATE:

ADDRESS:

CHANGE REQUEST

WHO AUTHORIZED THE CHANGE:

DESCRIBE THE NEEDED CHANGE & WHY:

NEW DESIGN LAYOUT

DRAW THE MOUNTING PLANE SHOWING THE NEW MODULE LAYOUT:

INSTALLER NAME(PRINT):

I UNDERSTAND AND AGREE TO THE CHANGES MADE ABOVE:

CUSTOMER NAME | CUSTOMER SIGNATURE | DATE

LGCY POWER

JOB HAZARD ANALYSIS

CUSTOMER NAME/JOB ID:_____ **CUSTOMER ADDRESS**

_____**INSTALL DATE** ____-___-____ **Time**___:___**am/pm**

HAZARD CATEGORY	HAZARD TYPE	HAZARD CONTROL MEASURES
LADDER SAFETY	• LOCATION • CONDITION • WORKING CLEARANCE	
FALL PROTECTION	• WORKING 6' OR HIGHER	
ELECTRICAL SAFETY	• ARCH FLASH • ELECTRIC SHOCK/ELECTROCUTION	
WEATHER CONDITIONS	• HEAT/COLD TEMP • RAINY/ICY/WINDY	
PUBLIC SAFETY	• WORK/OBJECTS OVERHEAD • SLIPS/TRIPS/FALLS • ACCESS TO LIVE ELECTRICAL	

NEAREST EMERGENCY FACILITY	
CONTACT IMMEDIATLY IN EMERGENCY (911 AND/OR)	

GENERAL SITE DISCRIPTION/NOTES

CREW MEMBERS ON SITE FOR INSTALL

NAME	SIGNATURE
FMU/LMD-	

ELECTRICAL COMPLETION PHOTOS QR CODE

ROOFTOP INSTALLATION PHOTOS QR CODE

MPU COMPLETION PHOTOS QR CODE

LGCY POWER

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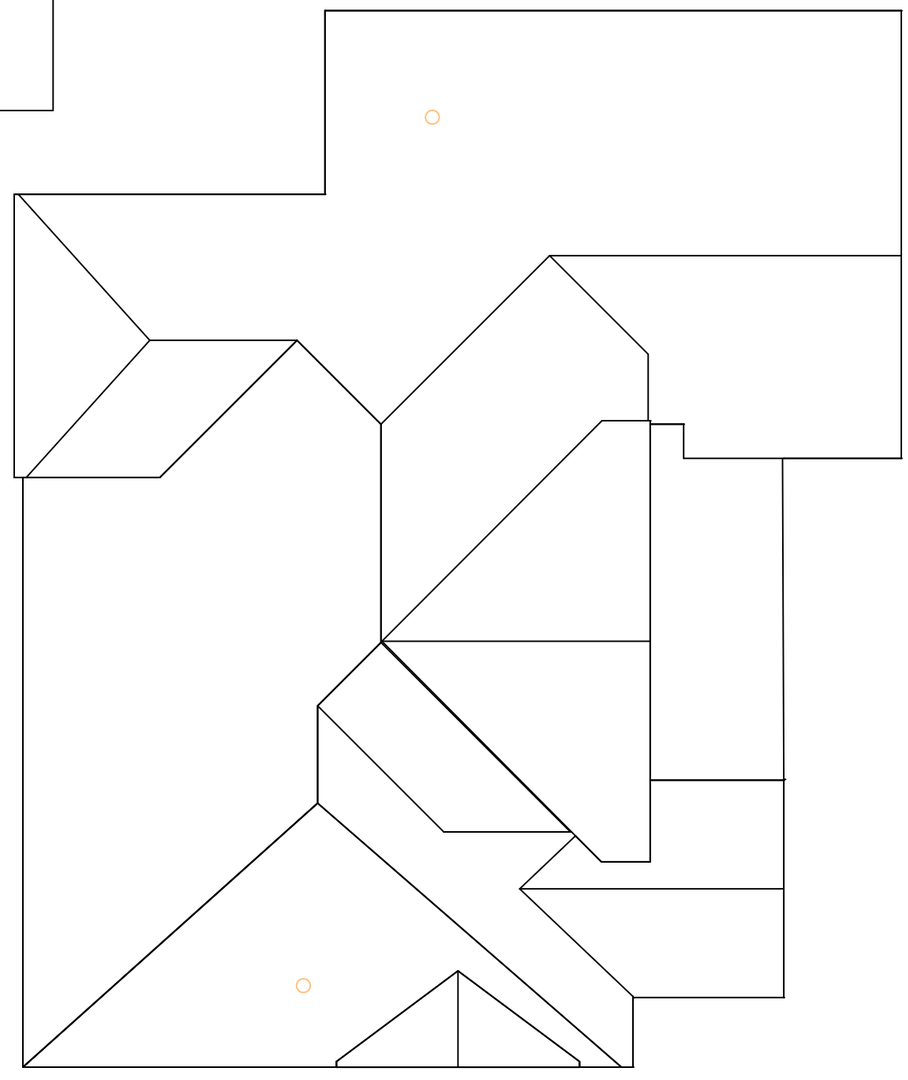
FIELD CHANGE SHEET

PV-8

FIELD DESIGN CHANGE REQUEST FORM

WHO AUTHORIZED THE CHANGE:
DESCRIBE THE NEEDED CHANGE & WHY:

NEW DESIGN LAYOUT:



I UNDERSTAND AND AGREE TO THE CHANGES MADE ABOVE:

CUSTOMER NAME

CUSTOMER SIGNATURE

DATE

LGCY POWER

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FIELD CHANGE SHEET

PV-8.1

Q.PEAK DUO BLK ML-G10+ SERIES

395 - 415 Wp | 132 Cells
21.1 % Maximum Module Efficiency
Domestic Content Option Available

MODEL Q.PEAK DUO BLK ML-G10.a+
*Q.PEAK DUO BLK ML-G10.C+

Includes Domestic Content

This product contains U.S. manufactured components which can contribute to qualifying for the 10% domestic content bonus to applicable tax credits under the Inflation Reduction Act of 2022.[1]

Breaking the 21% efficiency barrier

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.1%.

A reliable investment

Inclusive 25-year product warranty and 25-year linear performance warranty.[2]

Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[3] and Hot-Spot Protect.

Extreme weather rating

High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

Far beyond the standard

Qcells' comprehensive quality program ensures high long-term yields and the reliability of your solar system.

[1] This statement should not be relied on as tax advice and is subject to change based on changes made to the Inflation Reduction Act and its implementing rules and regulations. Please consult a qualified tax professional for specific guidance.
[2] See data sheet on rear for further information.
[3] APT test conditions according to IEC/TS 62804-1:2015, method A (−1500 V, 96 h)

The ideal solution for:

Rooftop arrays on residential buildings

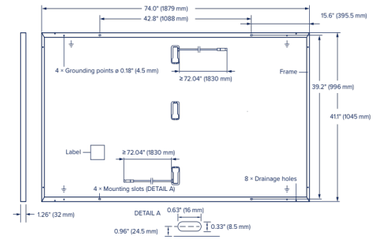
***DCA Module Option:**

DCA 17 module has material code 'MD06G100A-017' printed on the module power label.

Q.PEAK DUO BLK ML-G10+ SERIES

Mechanical Specification

Format	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥72.04 in (1830 mm), (−) ≥72.04 in (1830 mm)
Connector	Stäubli MC4; IP68

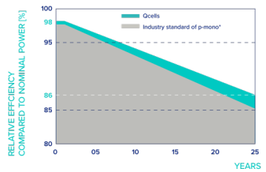


Electrical Characteristics

POWER CLASS			395	400	405	410	415
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)							
Minimum	Power at MPP[1]	P_{MPP} [W]	395	400	405	410	415
Minimum	Short Circuit Current[1]	I_{SC} [A]	11.10	11.14	11.17	11.20	11.23
Minimum	Open Circuit Voltage[1]	V_{OC} [V]	45.27	45.30	45.34	45.37	45.41
Minimum	Current at MPP	I_{MPP} [A]	10.71	10.77	10.83	10.89	10.95
Minimum	Voltage at MPP	V_{MPP} [V]	36.88	37.13	37.39	37.64	37.89
Minimum	Efficiency[1]	η [%]	≥20.1	≥20.4	≥20.6	≥20.9	≥21.1
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP} [W]	296.3	300.1	303.8	307.6	311.3
Minimum	Short Circuit Current	I_{SC} [A]	8.95	8.97	9.00	9.03	9.05
Minimum	Open Circuit Voltage	V_{OC} [V]	42.69	42.72	42.76	42.79	42.83
Minimum	Current at MPP	I_{MPP} [A]	8.46	8.51	8.57	8.62	8.68
Minimum	Voltage at MPP	V_{MPP} [V]	35.03	35.25	35.46	35.68	35.89

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY

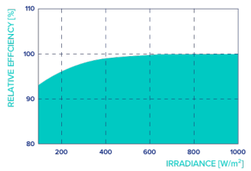


At least 98 % of nominal power during first year. Thereafter max. 0.5 % degradation per year. At least 93.5 % of nominal power up to 10 years. At least 86 % of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organization of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°F]	109±5.4 (43±3 °C)

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1000 (IEC)/1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating		[A DC]	20	Fire Rating based on ANSI/UL 61730	TYPE 2
Max. Design Load, Push/Pull[3]		[lbs/ft²]	75 (3600 Pa)/55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	−40 °F up to +185 °F (−40 °C up to +85 °C)
Max. Test Load, Push/Pull[3]		[lbs/ft²]	113 (5400 Pa)/84 (4000 Pa)		

[3] See Installation Manual

Qualifications and Certificates

UL61730-1 & UL61730-2, CE-compliant, Quality Controlled PV - TÜV Rheinland, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells),

*Contact your Qcells Sales Representative for details regarding the module's eligibility to be Buy American Act (BAA) compliant.

Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.
Hanwha Q CELLS America Inc. 300 Spectrum Center Drive, Suite 500, Irvine, CA 92618, USA | TEL +1 (949) 748 5996 | EMAIL na.support@qcells.com | WEB www.qcells.com

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MODULE DATA SHEET

DS-1

ENPHASE

DATA SHEET

IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.

Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.

Enphase 25 year limited warranty

IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.

Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.

UL CERTIFIED SAFETY

IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.

Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) requirements

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	W	235 – 350	235 – 440
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell and 72-cell/144 half-cell
MPPT voltage range	V	27 – 37	29 – 45
Operating range	V	25 – 48	25 – 58
Min/max start voltage	V	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current[2] [module Isc]	A	15	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)		**IQ8-60-2-US**	**IQ8PLUS-72-2-US**
Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage/range[3]	V	240 / 211 – 264	
Max continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
Max units per 20 A (L-L) branch circuit[4]		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.5	97.6
CEC weighted efficiency	%	97	97
Night-time power consumption	mW	60	
MECHANICAL DATA			
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)	
Relative humidity range		4% to 100% (condensing)	
DC Connector type		MC4	
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection – no fans	
Approved for wet locations		Yes	
Acoustic noise at 1 m		<60 dBA	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure	
Environ. category / UV exposure rating		NEMA Type 6 / outdoor	
COMPLIANCE			
Certifications		CA Rule 21 (UL 1741-SA), UL 62109-1, 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 conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.	

(1) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility (2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-DS-0002-01-EN-US-2021-10-19

LGCY POWER

LEGACY INSTALLATION SERVICES, LLC

3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-353-4899

QUALIFIER #: U.13732
ELECTRICAL LIC#: U.34989

NEW PHOTOVOLTAIC ROOF MOUNTED SYSTEM

GLENDA BELLAMY
239 FALLING WATER RD,
SPRING LAKE, NC 28390
7.380 kW DC/ **5.220** kW AC ROOF MOUNTED PV SYSTEM

PROJECT ID	N/A
DATE	11 July 2025
CREATED BY	RG
SIGNATURE	

INVERTER DATA SHEET

DS-2

ENPHASE.

DATASHEET

X-IQ-AM1-240-5
X-IQ-AM1-240-5C

IQ Combiner 5/5C

The IQ Combiner 5/5C consolidates interconnection equipment into a single enclosure and streamlines IQ Series Microinverters and IQ Gateway installation by providing a consistent, pre-wired solution for residential applications. IQ Combiner 5/5C uses wired control communication and is compatible with IQ System Controller 3/3G and IQ Battery 5P.

The IQ Combiner 5/5C, along with IQ Series Microinverters, IQ System Controller 3/3G, and IQ Battery 5P provides you with a complete grid-agnostic Enphase Energy System.

IQ Series Microinverters
The high-powered smart grid-ready IQ Series Microinverters (IQ6, IQ7, and IQ8 Series) dramatically simplify the installation process

IQ System Controller 3/3G
Provides microgrid interconnection device (MID) functionality by automatically detecting grid failures and seamlessly transitioning the home energy system from grid power to backup power

IQ Battery 5P
Fully integrated AC battery system. Includes six field-replaceable IQ8D-BAT Microinverters

IQ Load Controller
Helps prioritize essential appliances during a grid outage to optimize energy consumption and prolong battery life

Smart
- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect (CELLMODEM-M1-06-SP-05), only with IQ Combiner 5C
- Supports flexible networking: Wi-Fi, Ethernet, or cellular
- Provides production metering (revenue grade) and consumption monitoring

Easy to install
- Mounts to one stud with centered brackets
- Supports bottom, back, and side conduit entry
- Supports up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV branch circuits

Reliable
- Durable NRTL-certified NEMA type 3R enclosure
- 5-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKUs
- UL1741 listed

Enphase 5 year limited warranty
5-year limited warranty

UL LISTED

IQ Combiner 5/5C

MODEL NUMBER	
IQ Combiner 5 (X-IQ-AM1-240-5)	IQ Combiner 5 with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSIC12.20 ±0.5%), consumption monitoring (± 2.5%) and IQ Battery monitoring (±2.5%). Includes a silver solar shield to deflect heat
IQ Combiner 5C (X-IQ-AM1-240-5C)	IQ Combiner 5C with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%) and IQ Battery monitoring (±2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05)[1]. Includes a silver solar shield to deflect heat
WHAT'S IN THE BOX	
IQ Gateway printed circuit board	IQ Gateway is the platform for total energy management for comprehensive, remote maintenance and management of the Enphase IQ System
Busbar	125A busbar with support for 1 x IQ Gateway breaker and 4 x 20A breaker for installing IQ Series Microinverters and IQ Battery 5P
IQ Gateway breaker	Circuit breaker, 2-pole, 10 A/15 A
Production CT	Prewired revenue-grade solid core CT, accurate up to 0.5%
Consumption CT	Two consumption metering clamp CTs, shipped with the box, accurate up to 2.5%
IQ Battery CT	One battery metering clamp CT, shipped with the box, accurate up to 2.5%
CTRL board	Control board for wired communication with IQ System Controller 3/3G and the IQ Battery 5P
Enphase Mobile Connect (only with IQ Combiner 5C)	4G-based LTE-M1 cellular modem (CELLMODEM-M1-06-SP-05) with a 5-year T-Mobile data plan
Accessories kit	Spare control headers for CTRL board
ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)	
CELLMODEM-M1-06-SP-05	4G-based LTE-M1 cellular modem with a 5-year T-Mobile data plan
CELLMODEM-M1-06-AT-05	4G-based LTE-M1 cellular modem with a 5-year AT&T data plan
Circuit breakers (off-the-shelf)	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers Supports Eaton BR220B, BR230B, and BR240B circuit breakers compatible with hold-down kit
Circuit breakers (provided by Enphase)	BRK-10A-2-240V, BRK-15A-2-240V, BRK-20A-2P-240V, BRK-15A-2P-240V-B, and BRK-20A-2P-240V-B (More details in "Accessories" section)
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 5/5C
XA-ENV2-PCBA-5	IQ Gateway replacement printed circuit board (PCB) for Combiner 5/5C
X-IQ-NA-HD-125A	Hold-down kit compatible with Eaton BR-B series circuit breakers (with screws)
ELECTRICAL SPECIFICATIONS	
Rating	80 A
System voltage	120/240 VAC, 60 Hz
Busbar rating	125 A
Fault curent rating	10 kAIC
Maximum continuous current rating (input from PV/storage)	64 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series distributed generation (DG) breakers only (not included)
Maximum total branch circuit breaker rating (input)	80 A of distributed generation/95 A with IQ Gateway breaker included
IQ Gateway breaker	10 A or 15 A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-CLAMP)	A pair of 200 A clamp-style current transformers is included with the box
IQ Battery metering CT	200 A clamp-style current transformer for IQ Battery metering, included with the box

[1] A plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.)

IQC-5-5C-DSH-00007-1.0-EN-US-2023-07-12

LGCY POWER

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GLENDA BELLAMY
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7.380 kW DC/ **5.220** kW AC ROOF MOUNTED PV SYSTEM

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SIGNATURE	

COMBINER DATA SHEET

DS-3

MECHANICAL DATA	
Dimensions (WxHxD)	37.5 cm x 49.5 cm x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40°C to 46°C (-40°F to 115°F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 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
Communication (In-premise connectivity)	Built-in CTRL board for wired communication with IQ Battery 5P and IQ System Controller 3/3G. Integrated Power Line Communication for IQ Series Microinverters
Altitude	Up to 2,600 meters (8,530 feet)
COMMUNICATION INTERFACES	
Integrated Wi-Fi	802.11b/g/n (dual band 2.4 GHz/5 GHz), for connecting the Enphase cloud via the internet
Wi-Fi range (recommended)	10 m
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included), for connecting to the Enphase Cloud via the internet
Mobile Connect	CELLMODEM-M1-06-SP-05 or CELLMODEM-M1-06-AT-05 (included with IQ Combiner 5C)
Digital I/O	Digital input/output for grid operator control
USB 2.0	For Mobile Connect
Access point (AP) mode	For connection between the IQ Gateway and a mobile device running the Enphase Installer App
Metering ports	Up to two Consumption CTs, one IQ Battery CT, and one Production CT
Power line communication	90–110 kHz
Web API	Refer to https://developer-v4.enphase.com
Local API	Refer to guide for local API
COMPLIANCE	
IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, Title 47 CFR, Part 15, Class B, ICES 003
IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1, IEEE 1547: 2018 (UL 1741-SB, 3rd Ed.) IEEE 2030.5/CSIP Compliant Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
COMPATIBILITY	
IQ System Controller 3/3G	SC200D111C240US01, SC200G111C240US01
IQ Battery 5P	IQBATTERY-5P-1P-NA
Microinverter	IQ6, IQ7, and IQ8 Series Microinverters

Accessories

Enphase Mobile Connect

4G-based LTE-M1 cellular modem with a 5-year data plan
(CELLMODEM-M1-06-SP-05 for Sprint and CELLMODEM-M1-06-AT-05 for AT&T)

Circuit breakers

BRK-10A-2-240V Circuit breaker, 2-pole, 10 A, Eaton BR210
BRK-15A-2-240V Circuit breaker, 2-pole, 15 A, Eaton BR215
BRK-20A-2P-240V Circuit breaker, 2-pole, 20 A, Eaton BR220
BRK-15A-2P-240V-B Circuit breaker, 2-pole, 15 A, Eaton BR215B with hold-down kit support
BRK-20A-2P-240V-B Circuit breaker, 2-pole, 20 A, Eaton BR220B with hold-down kit support

CT-200-SOLID

200 A revenue grade solid core Production CT with <0.5% error rate (replacement SKU)

CT-200-CLAMP

200 A clamp-style consumption and battery metering CT with <2.5% error rate (replacement SKU)

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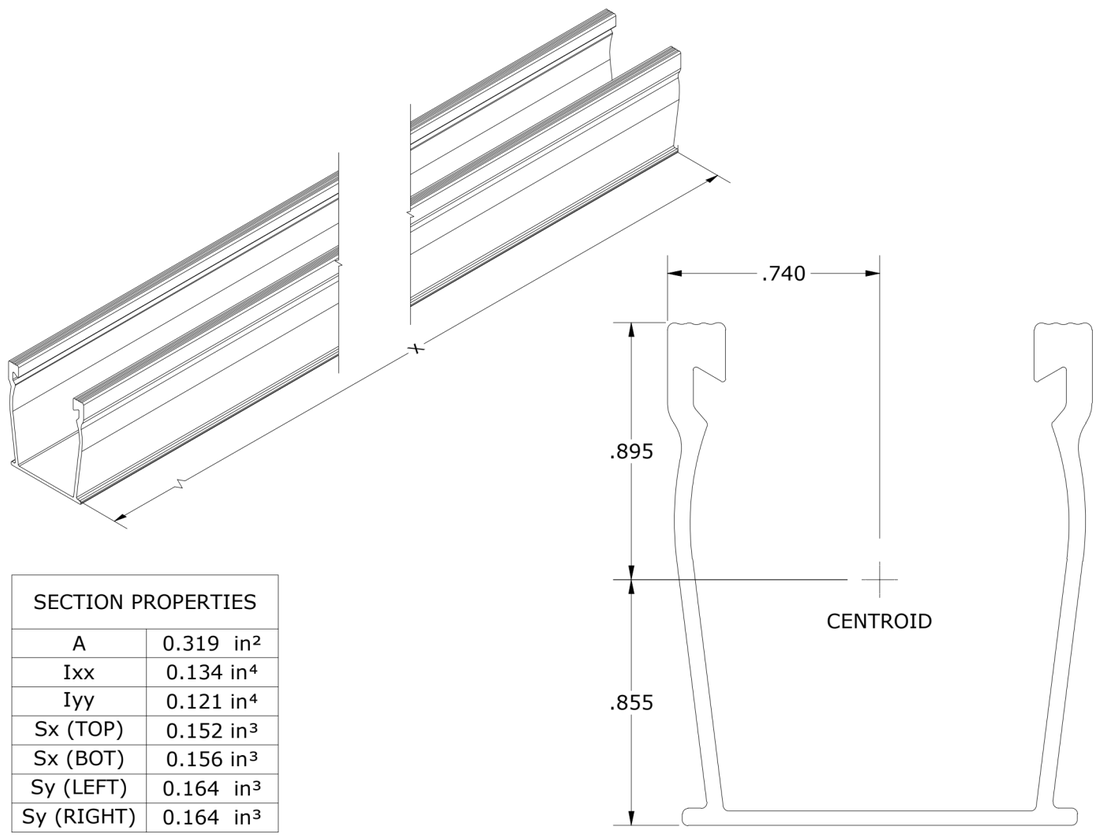
COMBINER DATA SHEET

DS-4

DESCRIPTION: SNAPNRACK, TDS, UR-45 RAIL (USA)	DOC NUMBER: SNR-DC-01451	SnapNrack®
PART NUMBER(S): 232-10095-USA, 232-10096-USA, 232-10097-USA, 232-10130-USA	DRAWN BY: H.WULFEKOETTER	SNR SOLAR LLC 775 FIERO LANE, SUITE 200 SAN LUIS OBISPO, CA 93401 USA EMAIL: CONTACT@SNAPNRACK.COM
UNITS: IN, LB, DEG [MM, KG, DEG] / SHEET: 1:1	REV: C / DATE: 4/1/2025	

UR-45 RAIL PROPERTIES			
SKU	FINISH	RAIL LENGTH (X)	WEIGHT (lb)
232-10095-USA	MILL	172 in	5.55
232-10096-USA	BLACK	172 in	5.55
232-10097-USA	MILL	94 in	3.03
232-10130-USA	MILL	186 in	6.00



SECTION PROPERTIES	
A	0.319 in²
Ixx	0.134 in⁴
Iyy	0.121 in⁴
Sx (TOP)	0.152 in³
Sx (BOT)	0.156 in³
Sy (LEFT)	0.164 in³
Sy (RIGHT)	0.164 in³

MATERIALS:	6005-T5 ALUMINUM
DESIGN LOAD (LBS):	N/A
ULTIMATE LOAD (LBS):	N/A
TORQUE SPECIFICATION:	N/A FT-LBS
CERTIFICATION:	UL 2703, FILE E359313
WEIGHT (LBS):	VARIES, SEE PROPERTIES TABLE

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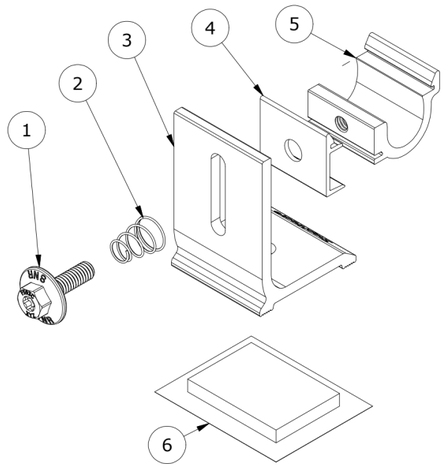
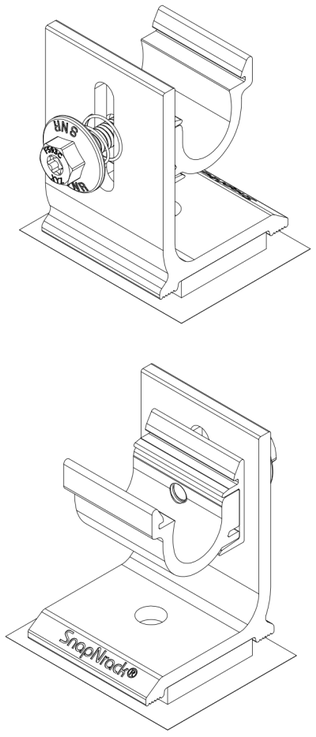
RACKING SPEC SHEET

DS-5

DESCRIPTION:	DOC NUMBER:	SnapNrack®
SNAPNRACK, TDS, ULTRAFOOT RAFTER	SNR-DC-01436	
PART NUMBER(S):	DRAWN BY:	SNR SOLAR LLC
242-10056	M.AFFENTRANGER	775 FIERO LANE, SUITE 200 SAN LUIS OBISPO, CA 93401 USA EMAIL: CONTACT@SNAPNRACK.COM
UNITS: IN, LB, DEG [MM, KG, DEG] / SHEET: 1:2	REV: B / DATE: 2/6/2025	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SNR SOLAR LLC.

DESIGN REACTIONS, ALLOWABLE						
FASTENER	SUBSTRATE	EMBEDMENT	UPLIFT (LB)	DOWNFORCE (LB)	SIDE (LB)	LATERAL (LB)
(1) 5/16" LAG SCREW	WOOD FRAMING	2-1/2"	1325	2500	444	735

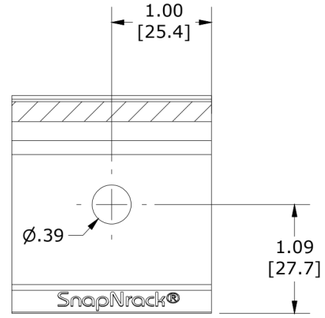




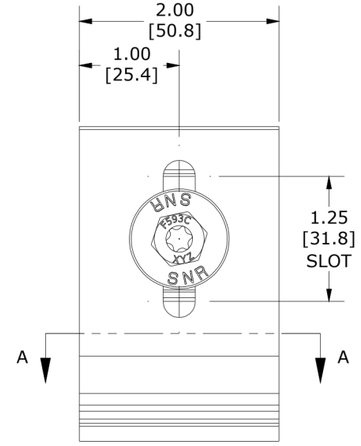
PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	BOLT, WIDE FLANGE, RECESSED, 5-16IN-18 X 1IN, SS
2	1	SNAPNRACK, ULTRA RAIL MOUNT SPRING, SS
3	1	SNAPNRACK, ULTRAFOOT BASE, RAFTER, BLACK
4	1	SNAPNRACK, UR FLIP CLAMP, THRU, SILVER
5	1	SNAPNRACK, UR FLIP CLAMP, TAP, BLACK
6	1	SNAPNRACK, BUTYL PAD, 2.00IN X 1.44IN X .25IN

MATERIALS:	6000 SERIES ALUMINUM & 300 SERIES STAINLESS STEEL
TORQUE SPECIFICATION:	16 FT-LBS FT-LBS
CERTIFICATION:	UL 2703, FILE E359313
WEIGHT (LBS):	.365

DESCRIPTION:	DOC NUMBER:	SnapNrack®
SNAPNRACK, TDS, ULTRAFOOT RAFTER	SNR-DC-01436	
PART NUMBER(S):	DRAWN BY:	SNR SOLAR LLC
242-10056	M.AFFENTRANGER	775 FIERO LANE, SUITE 200 SAN LUIS OBISPO, CA 93401 USA EMAIL: CONTACT@SNAPNRACK.COM
UNITS: IN, LB, DEG [MM, KG, DEG] / SHEET: 2:2	REV: B / DATE: 2/6/2025	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SNR SOLAR LLC.



SECTION A-A



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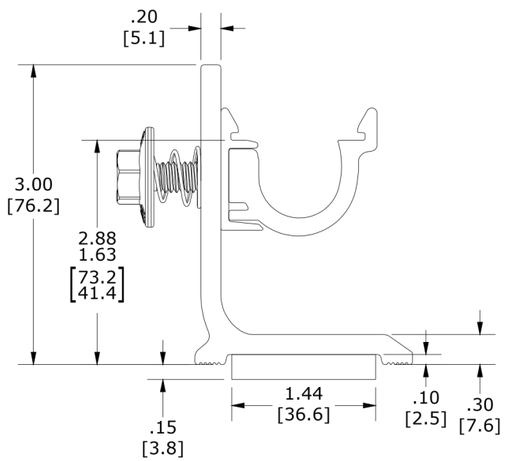

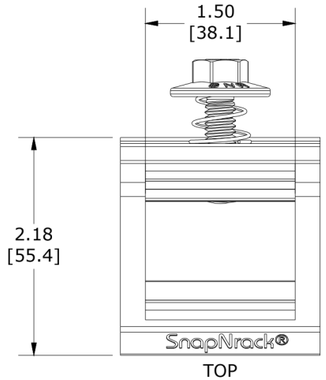

TOP

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ATTACHMENT SPEC SHEET

DS-6