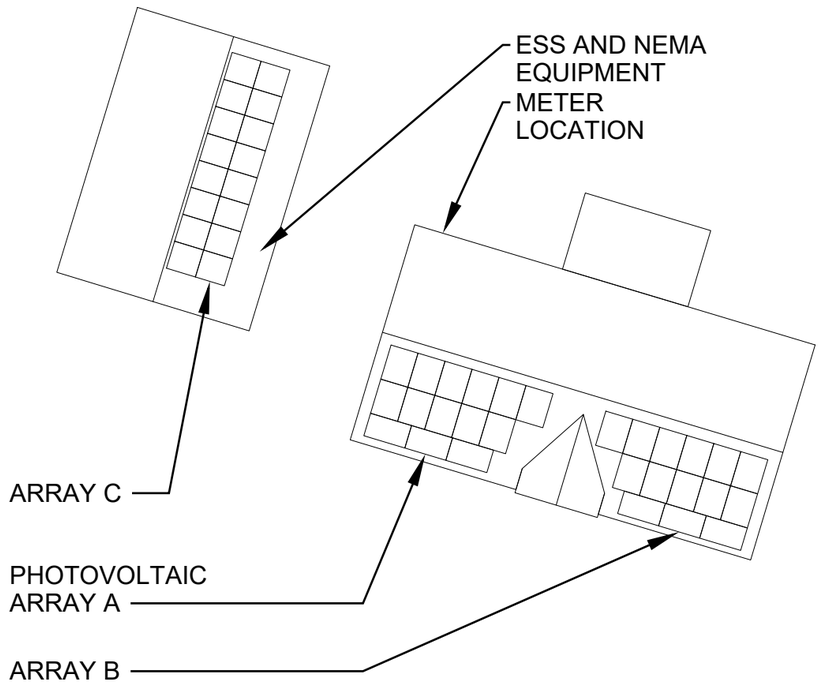
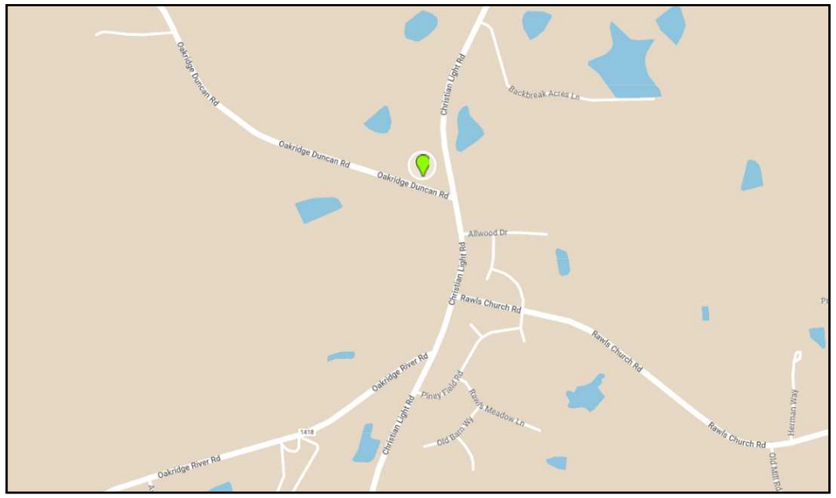
SHEET INDEX:



01 G-01 **SITE SKETCH**
SCALE: 1:240



02 G-01 **LOCATION MAP (VICINITY)**

AUTHORITIES HAVING JURISDICTION:
BUILDING: HARNETT
ZONING: HARNETT
ELECTRICAL: HARNETT
UTILITY: DEP

REFERENCE CODES:

ELECTRICAL CODE:	2017 NEC
BUILDING CODE(S):	2018 IRC WITH NORTH CAROLINA AMENDMENTS
FIRE CODE:	2018 IFC WITH NORTH CAROLINA AMENDMENTS
ENGINEERING:	ASCE 7-10

DESIGN CRITERIA:

GROUND SNOW LOAD:	15 PSF
DESIGN WIND SPEED:	115 MPH
DESIGN EXPOSURE CATEGORY:	B
DEAD LOAD:	2.87 PSF
AVERAGE HIGH TEMPERATURE:	34°C
ASHRAE LOW TEMPERATURE:	-9°C

SYSTEM ATTRIBUTES	QTY
Q Tron 430	44
TESLA POWERWALL 3	1

SYSTEM SIZE

11.500 kW-AC/ 18.920 kW-DC

NAME	EMAIL	PHONE	TITLE
ROBERT PARKER	ROBERT.PARKER@CAPEFEARSOLARSYSTEMS.COM	910-232-6288	CHIEF OPERATING OFFICER
DANIEL CAVANAGH	DANIEL.CAVANAGH@CAPEFEARSOLARSYSTEMS.COM	910-599-0428	RESIDENTIAL PROJECT MANAGER
WILLIAM PARKER	WILLIAM.PARKER@CAPEFEARSOLARSYSTEMS.COM	910-777-3749	COMMERCIAL PROJECT ASSOCIATE
MICHAEL HORAN	MICHAEL.HORAN@CAPEFEARSOLARSYSTEMS.COM	336-404-0511	PROJECT DEVELOPMENT COORDINATOR
JOHN NOVAK	JOHN.NOVAK@CAPEFEARSOLARSYSTEMS.COM	910-622-7361	SOLAR DESIGNER
DEREK MADRID	DEREK.MADRID@CAPEFEARSOLARSYSTEMS.COM	910-574-4229	SOLAR SITE SURVEYOR

STRUCTURAL REVIEW PROVIDED BY:
RONALD P. BITTLER, PE
RB ENGINEERING, INC. (C-2499)
168 QUADE DRIVE
CARY, NC 27513
919-677-9662
PROJECT #RB-249962

Ron Bittler, PE

Digitally signed by Ron Bittler, PE
DN: cn=Ron Bittler, PE, o, ou, email=rbittler@rbengineering.com, c=US
Date: 2024.09.03 15:40:21 -04'00'

CAPE FEAR SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533
GC LIC. NO. : 65677
ELEC. LIC. NO. : U-33321

18.92 kW DC PV SYSTEM
WILLIAM CROCKER
74 Oakridge Duncan Rd, Fuquay-Varina, NC 27526

COVER

NORTH CAROLINA PROFESSIONAL SEAL 025611 ENGINEER RONALD P. BITTLER

STRUCTURAL
09.03.2024

REVISION LIST

#	REV. DATE	DESC.

DATE:	**September 3, 2024**
DRAWN BY:	**JPN**

Sheet No.

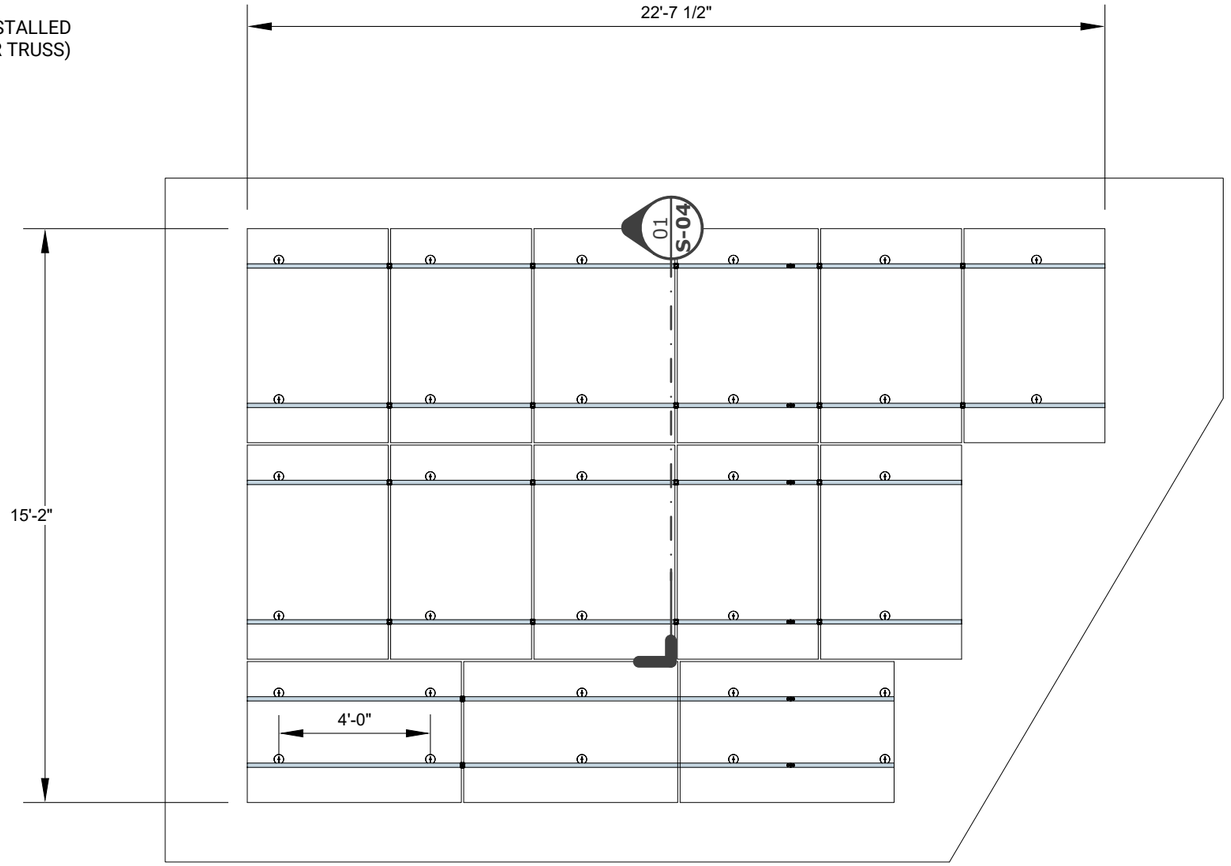
G-01

STRUCTURAL NOTES

1. ROOF MOUNT RACKING SYSTEM & PV ARRAY TO BE INSTALLED IN STRICT ACCORDANCE WITH THESE DRAWINGS & MFG'S RECOMMENDATIONS. MINOR SPACING MODIFICATIONS ARE ACCEPTABLE TO ACCOMODATE EXISTING ROOF STRUCTURE MEMBERS

2. EXISTING ROOF STRUCTURE HAS BEEN INCLUDED IN THE STRUCTURAL EVALUATION AND FOUND SUITABLE FOR THIS INSTALLATION

3. ALL ATTACHMENT BOLTS SHALL BE INSTALLED IN THE MIDDLE THIRD OF THE RAFTER (OR TRUSS) THICKNESS



01 / S-01 **PLAN - ARRAY A LAYOUT**
SCALE: 1/4" = 1'

CAPE FEAR SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533

GC LIC. NO. : 65677
ELEC. LIC. NO. : U-33321

18.92 kW DC PV SYSTEM
WILLIAM CROCKER
74 Oakridge Duncan Rd, Fuquay-Varina, NC 27526

ARRAY A LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 025611 ENGINEER RONALD P. BITTLER
09.03.2024

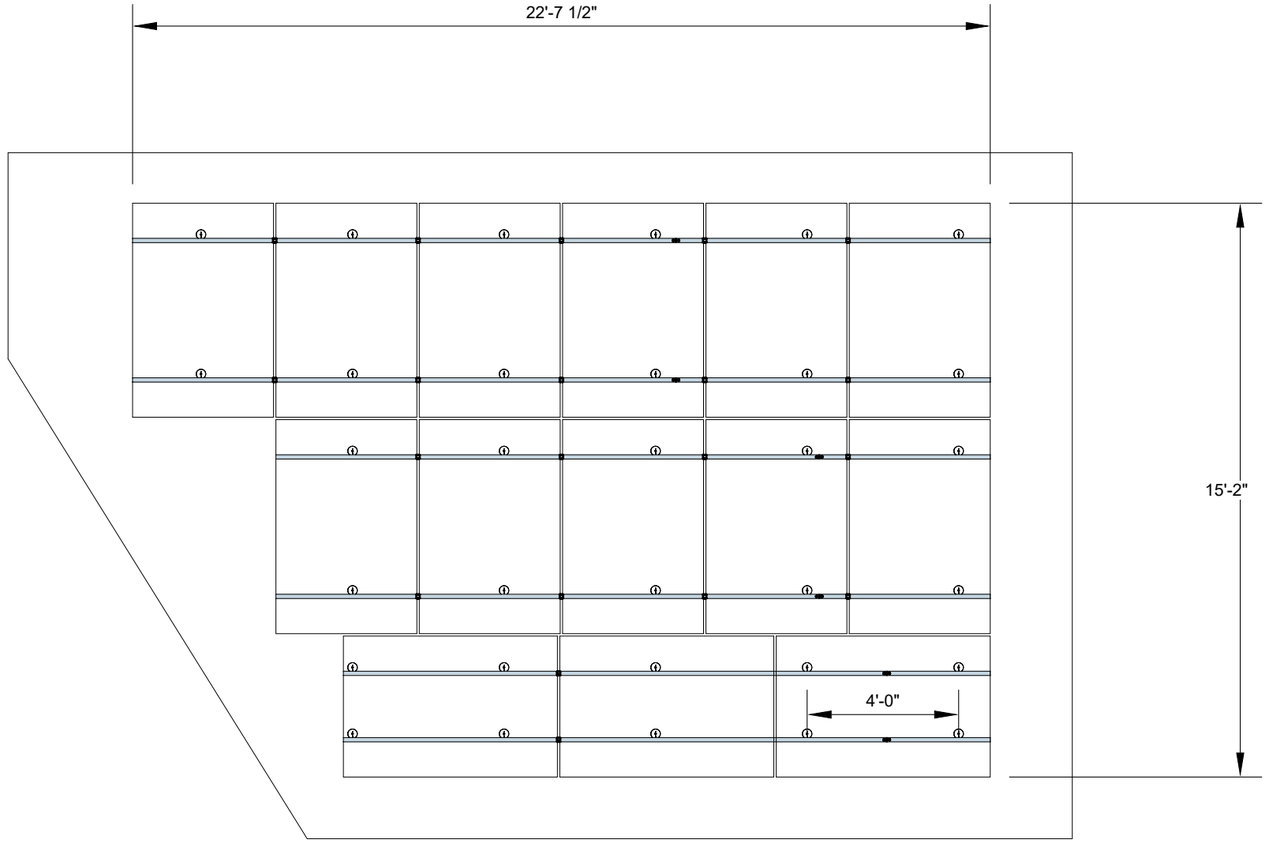
REVISION LIST

#	REV. DATE	DESC.

DATE:	**September 3, 2024**
DRAWN BY:	**JPN**

Sheet No.

S-01



01
S-02

PLAN - ARRAY B LAYOUT
SCALE: 1/4" = 1'

CAPE FEAR SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533

GC LIC. NO. : 65677
ELEC. LIC. NO. : U-33321

18.92 kW DC PV SYSTEM
WILLIAM CROCKER
74 Oakridge Duncan Rd,
Fuquay-Varina, NC 27526

ARRAY B LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 025611 ENGINEER RONALD P. BITTLER

09.03.2024

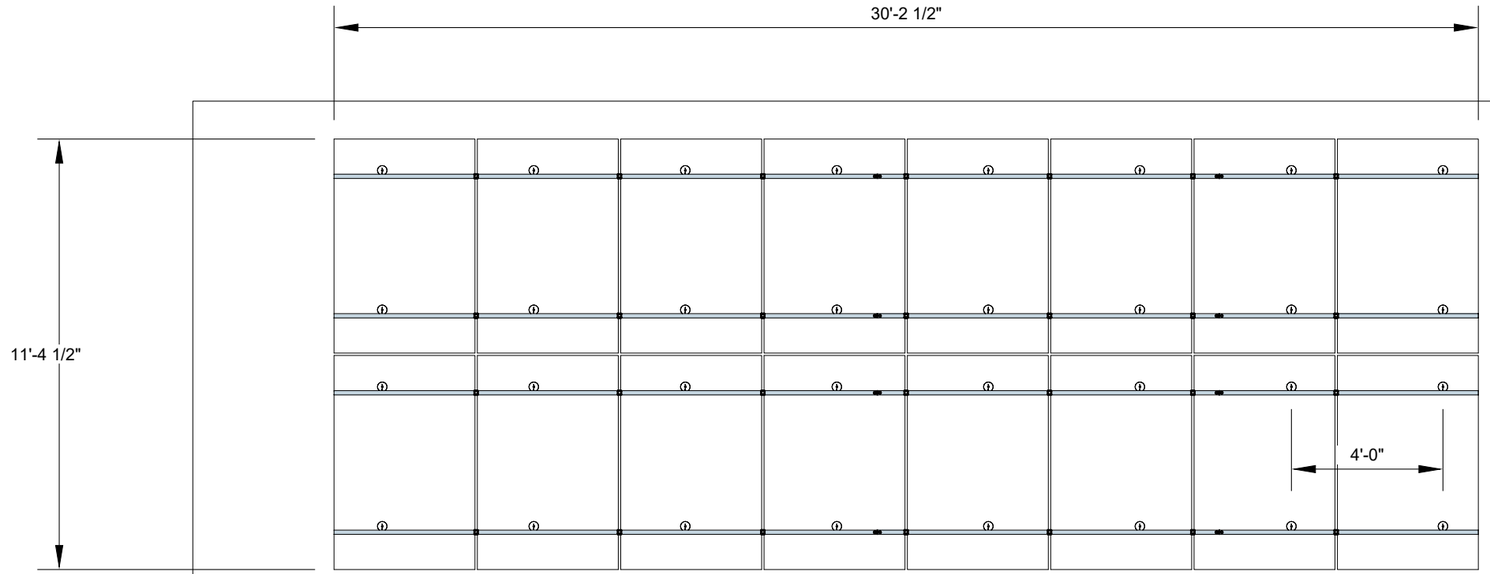
REVISION LIST ⚠

#	REV. DATE	DESC.

DATE:	**September 3, 2024**
DRAWN BY:	**JPN**

Sheet No.

S-02



01
S-03

PLAN - ARRAY C LAYOUT
SCALE: 1/4" = 1'

CAPE FEAR SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533

GC LIC. NO. : 65677
ELEC. LIC. NO. : U-33321

18.92 kW DC PV SYSTEM
WILLIAM CROCKER
74 Oakridge Duncan Rd,
Fuquay-Varina, NC 27526

ARRAY C LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 025611 ENGINEER RONALD P. BITTLER

09.03.2024

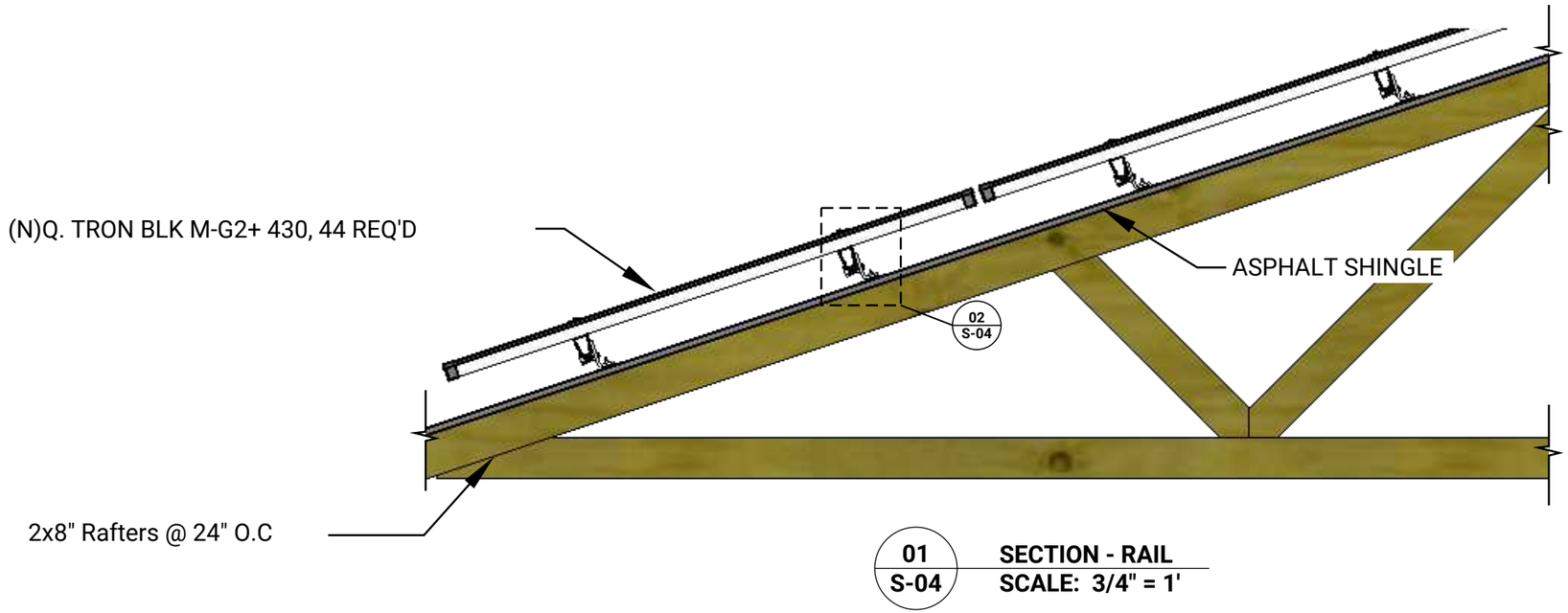
REVISION LIST

#	REV. DATE	DESC.

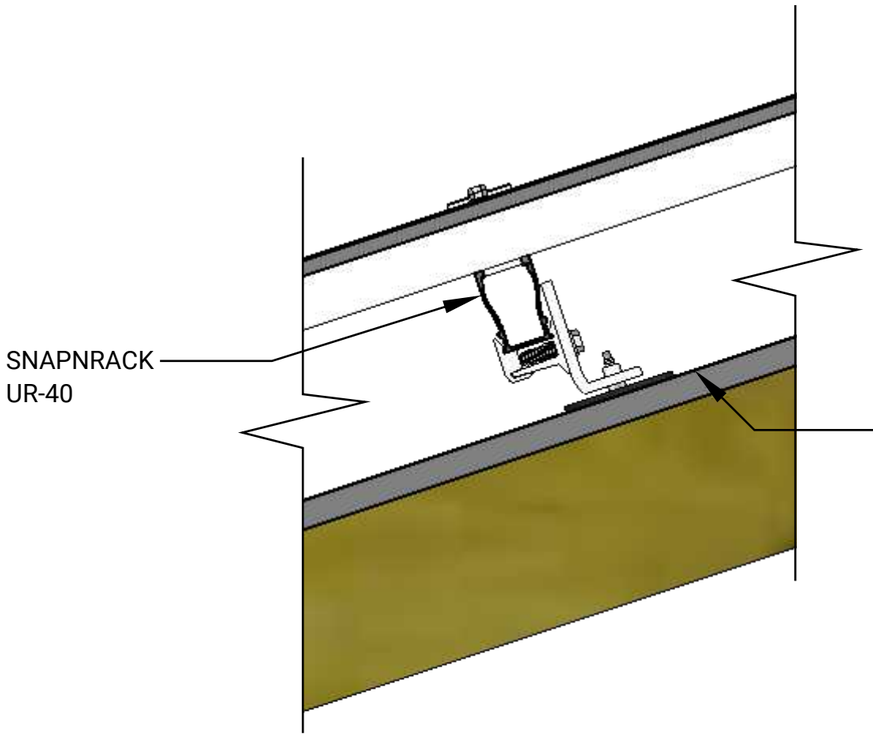
DATE:	**September 3, 2024**
DRAWN BY:	**JPN**

Sheet No.

S-03



01 / S-04 **SECTION - RAIL**
SCALE: 3/4" = 1'



02 / S-04 **DETAIL - SPEEDSEAL**
SCALE: 3" = 1'

CAPE FEAR SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533
GC LIC. NO. : 65677
ELEC. LIC. NO. : U-33321

18.92 kW DC PV SYSTEM
WILLIAM CROCKER
74 Oakridge Duncan Rd, Fuquay-Varina, NC 27526

ASSEMBLY DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 025611 ENGINEER RONALD P. BITTLER
09.03.2024

REVISION LIST

#	REV. DATE	DESC.

DATE:	**September 3, 2024**
DRAWN BY:	**JPN**

Sheet No.

S-04

Q.TRON BLK M-G2+ SERIES

410-430Wp | 108 Cells
22.4% Maximum Module Efficiency

PRELIMINARY

MODEL Q.TRON BLK M-G2+

High performance Qcells N-type solar cells
Q.ANTUM NEO Technology with optimized module layout boosts module efficiency up to 22.4%.

A reliable investment
Inclusive 25-year product warranty and 25-year linear performance warranty[1].

Enduring high performance
Long-term yield security with Anti LeTID Technology, Anti PID Technology[2], Hot-Spot Protect.

Extreme weather rating
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (3600 Pa).

Innovative all-weather technology
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

The most thorough testing programme in the industry
Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

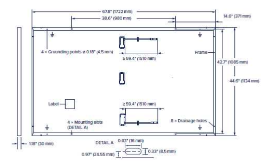
[1] See data sheet on rear for further information.
[2] APT test conditions according to IEC/TS 62804-1:2015, method A (−1500 V, 96 h)

The ideal solution for:
Rooftop arrays on residential buildings

Q.TRON BLK M-G2+ SERIES

Mechanical Specification

Format	67.8 in × 44.6 in × 1.18 in (including frame) (1722 mm × 1134 mm × 30 mm)
Weight	47.2 lbs (21.4 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 18 monocrystalline Q.ANTUM NEO 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), Protection class IP67, with bypass diodes
Cable	$4\,mm^2$ Solar cable; (+) ≥59.4 in (1510 mm), (−) ≥59.4 in (1510 mm)
Connector	Stäubli MC4; IP68

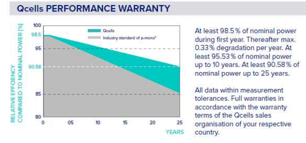


Electrical Characteristics

POWER CLASS			410	415	420	425	430
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)							
Power at MPP[1]	P_{MPP}	[W]	410	415	420	425	430
Short Circuit Current[1]	I_{SC}	[A]	13.39	13.42	13.46	13.49	13.53
Open Circuit Voltage[1]	V_{OC}	[V]	38.58	38.61	38.64	38.67	38.70
Current at MPP	I_{MPP}	[A]	12.68	12.75	12.82	12.88	12.95
Voltage at MPP	V_{MPP}	[V]	32.32	32.55	32.77	32.98	33.20
Efficiency[1]	η	[%]	≥21.4	≥21.6	≥21.9	≥22.2	≥22.4
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Power at MPP	P_{MPP}	[W]	310.0	313.8	317.6	321.4	325.2
Short Circuit Current	I_{SC}	[A]	10.79	10.82	10.84	10.87	10.90
Open Circuit Voltage	V_{OC}	[V]	36.61	36.63	36.66	36.69	36.71
Current at MPP	I_{MPP}	[A]	9.97	10.03	10.09	10.15	10.21
Voltage at MPP	V_{MPP}	[V]	31.09	31.29	31.48	31.66	31.85

[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

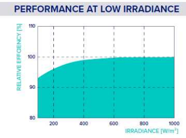


At least 98.5% of nominal power during first year. Thereafter max. 0.33% degradation per year. At least 95.53% of nominal power up to 10 years. At least 90.58% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation 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]	−0.24
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.30	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	C / TYPE 2
Max. Design Load, Push/Pull[3]	[lbs/ft²]	75 (3600 Pa)/50 (2400 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)/75 (3600 Pa)		

[3] See Installation Manual

Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland;
IEC 61215:2016;
IEC 61730:2016.
This data sheet complies with DIN EN 50380.

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. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hqc-inquiry@qcells.com | WEB www.qcells.com

Specifications subject to technical changes © Qcells Q.TRON_BLK_M-G2+_series_410-430_2022-09_Rev01_NA

Powerwall 3 Technical Specifications

System Technical Specifications

Model Number	1707000-xx-y
Nominal Grid Voltage (Input & Output)	120/240 VAC
Grid Type	Split phase
Frequency	60 Hz
Overcurrent Protection Device	Configurable up to 60 A
Solar to Battery to Grid Round Trip Efficiency	89% [1,2]
Solar to Grid Efficiency	97% [3]
Supported Islanding Devices	Backup Gateway 2, Backup Switch
Connectivity	Wi-Fi (2.4 and 5 GHz), Dual-port switched Ethernet, Cellular (LTE/4G [4])
Hardware Interface	Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters
AC Metering	Revenue Grade (+/- 0.5%)
Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters
Customer Interface	Tesla Mobile App
Warranty	10 years

Solar Technical Specifications

Maximum Solar STC Input	20 kW
Withstand Voltage	600 V DC
PV DC Input Voltage Range	60 — 550 V DC
PV DC MPPT Voltage Range	150 — 480 V DC
MPPTs	6
Maximum Current per MPPT (I_{mp})	13 A [5]
Maximum Short Circuit Current per MPPT (I_{sc})	15 A [5]

Battery Technical Specifications

Nominal Battery Energy	13.5 kWh AC [2]
Maximum Continuous Discharge Power	11.5 kW AC
Maximum Continuous Charge Power	5 kW AC
Output Power Factor Rating	0 - 1 (Grid Code configurable)
Maximum Continuous Current	48 A
Maximum Output Fault Current	10 kA
Load Start Capability (1 s)	150 A LRA
Power Scalability	Up to 4 Powerwall 3 units supported

[1] Typical solar shifting use case.
[2] Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.
[3] Tested using CEC weighted efficiency methodology.
[4] Cellular connectivity subject to network service coverage and signal strength.
[5] Where the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to 26 A I_{MP} / 30 A I_{SC}.

Powerwall 3 Technical Specifications

Environmental Specifications

Operating Temperature	-20°C to 50°C (-4°F to 122°F) [6]
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	-20°C to 30°C (-4°F to 86°F), up to 95% RH, non-condensing, State of Energy (SOE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Rating	NEMA 3R
Ingress Rating	IPX7 (Battery & Power Electronics) IPX5 (Wiring Compartment)
Pollution Rating	PD3
Operating Noise @ 1 m	<50 db(A) typical <62 db(A) maximum

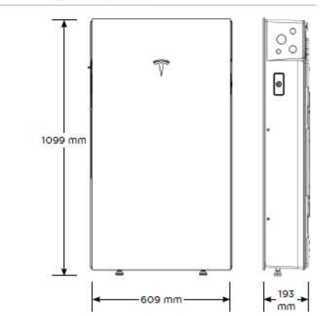
[6] Performance may be de-rated at operating temperatures above 40°C (104°F).

Compliance Information

Certifications	UL 1642, UL 1699B, UL 1741, UL 1741 SA, UL 1741 SB, UL 3741, UL 1973, UL 1998, UL 9540, IEEE 1547-2018, IEEE 1547.1, UN 38.3
Grid Connection	United States
Emissions	FCC Part 15 Class B
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)
Fire Testing	Meets the unit level performance criteria of UL 9540A

Mechanical Specifications

Dimensions	1099 x 609 x 193 mm (43.25 x 24 x 7.6 in)
Weight	130 kg (287 lb)
Mounting Options	Floor or wall mount



Solar Shutdown Device Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with Powerwall 3, solar array shutdown is initiated by any loss of AC power.

Electrical Specifications

Model	MCI-1	MCI-2
Nominal Input DC Current Rating (I_{MP})	12 A	13 A
Maximum Input Short Circuit Current (I_{SC})	19 A	17 A
Maximum System Voltage (PVHCS)	600 V DC	1000 V DC [7]

[7] Maximum System Voltage is limited by Powerwall to 600 V DC.

RSD Module Performance

Maximum Number of Devices per String	5	5
Control	Power Line Excitation	Power Line Excitation
Passive State	Normally Open	Normally Open
Maximum Power Consumption	7 W	7 W
Warranty	25 years	25 years

Environmental Specifications

Operating Temperature	-40°C to 50°C (-40°F to 122°F)	-45°C to 70°C (-49°F to 158°F)
Storage Temperature	-30°C to 70°C (-22°F to 158°F)	-30°C to 70°C (-22°F to 158°F)
Enclosure Rating	NEMA 4X / IP65	NEMA 4X / IP65

Mechanical Specifications

Electrical Connections	MC4 Connector	MC4 Connector
Housing	Plastic	Plastic
Dimensions	125 x 150 x 22 mm (5 x 6 x 1 in)	173 x 45 x 22 mm (6.8 x 1.8 x 1 in)
Weight	350 g (0.77 lb)	120 g (0.26 lb)
Mounting Options	ZEP Home Run Clip, M4 Screw (#10), M8 Bolt (5/16"), Nail / Wood screw	Wire Clip

Compliance Information

Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)
RSD Initiation Method	External System Shutdown Switch or Powerwall 3 Enable Switch

UL 3741 PV Hazard Control (and PVRSA) Compatibility

The following categories of solar module meet the UL 3741 PVHCS listing when installed with Powerwall 3 and Solar Shutdown Devices.

Tesla Solar Roof	PV Hazard Control System: BIPV compliance document
Tesla or Hanwha (Q.Peak Duo BLK or BLK-G6+) Modules certified for use with ZEP racking	PV Hazard Control System: ZS PVHCS compliance document
Other module and racking combinations	PV Hazard Control System: Generic PV Array compliance document

Backup Gateway 2

Backup Gateway 2 controls connection to the grid when paired with Powerwall 3, automatically detecting outages and providing seamless transition to backup power. Backup Gateway 2 also provides energy metering for solar self-consumption, time-based control, and backup operation.

In this system configuration, Powerwall 3 acts as the Site Controller, with the Backup Gateway 2 Site Controller disabled.

Performance Specifications

Model Number	1232100-xx-y
AC Voltage (Nominal)	120/240 V
Feed-in Type	Split phase
Grid Frequency	60 Hz
Current Rating	200 A
Maximum Supply Short Circuit Current	10 kA [8]
Overcurrent Protection Device	100 - 200 A, Service entrance rated [8]
Overvoltage Category	Category IV
Internal Primary AC Meter	Revenue accurate (+/- 0.2%)
Internal Auxiliary AC Meter	Revenue accurate (+/- 2%)
Primary Connectivity	Ethernet, Wi-Fi
Secondary Connectivity	Cellular (3G, LTE/4G) [9]
User Interface	Tesla App
Operating Modes	Support for solar self-consumption, time-based control, and backup
Backup Transition	Automatic disconnect for seamless backup
Modularity	Supports up to 10 AC-coupled Powerwalls
Optional Internal Panelboard	200 A 6-space / 12 circuit breakers Siemens QP or Square D HOM breakers rated 10 - 80A or Eaton BR breakers rated 10 - 125A
Warranty	10 years

[8] When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.
[9] The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

Environmental Specifications

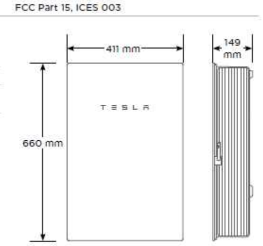
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Compliance Information

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 0.19, CSA 22.2 205
Emmissions	FCC Part 15, ICES 003

Mechanical Specifications

Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)
Weight	20.4 kg (45 lb)
Mounting options	Wall mount, Semi-flush mount



pe.eaton.com

Eaton general duty cartridge fuse safety switch

DG222NRB

UPC:782113144221

Dimensions:
- **Height:** 14.37 IN
- **Length:** 7.35 IN
- **Width:** 8.4 IN

Weight:10 LB

Notes: Maximum hp ratings apply only when dual element fuses are used. 3-Phase hp rating shown is a grounded B phase rating, UL listed.

Warranties:
- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

Specifications:
- **Type:** General duty, cartridge fused
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Painted galvanized steel
- **Fuse Class Provision:** Class H fuses
- **Fuse Configuration:** Fusible with neutral
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Three-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

Supporting documents:
- Eatons Volume 2-Commercial Distribution
- Eaton Specification Sheet - DG222NRB

Certifications:
- UL Listed

Product compliance: No Data

CAPE FEAR SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533

GC LIC. NO. : 65677
ELEC. LIC. NO. : U-33321

18.92 kW DC PV SYSTEM
WILLIAM CROCKER
74 Oakridge Duncan Rd, Fuquay-Varina, NC 27526

RESOURCES

REVISION LIST

#	REV. DATE	DESC.

DATE:	September 3, 2024
DRAWN BY:	JPN

Sheet No.

R-01

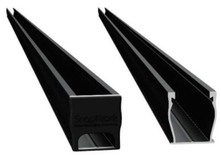
SnapNrack
Solar Mounting Solutions

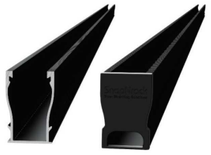
Ultra Rail

UR-40
UR-60

SnapNrack Ultra Rail System

A sleek, straightforward rail solution for mounting solar modules on all roof types. Ultra Rail features two rail profiles; UR-40 is a lightweight rail profile that is suitable for most geographic regions and maintains all the great features of SnapNrack rail, while UR-60 is a heavier duty rail profile that provides a larger rail channel and increased span capabilities. Both are compatible with all existing mounts, module clamps, and accessories for ease of install.





The Entire System is a Snap to Install

- New Ultra Rail Mounts include snap-in brackets for attaching rail
- Compatible with all the SnapNrack Mid Clamps and End Clamps customers love
- Universal End Clamps and snap-in End Caps provide a clean look to the array edge

Unparalleled Wire Management

- Open rail channel provides room for running wires resulting in a long-lasting quality install
- Industry best wire management offering includes Junction Boxes, Universal Wire Clamps, MLPE Attachment Kits, and Conduit Clamps
- System is fully bonded and listed to UL 2703 Standard

Heavy Duty UR-60 Rail

- UR-60 rail profile provides increased span capabilities for high wind speeds and snow loads
- Taller, stronger rail profile includes profile-specific rail splice and end cap
- All existing mounts, module clamps, and accessories are retained for the same great install experience

The Ultimate Value in Rooftop Solar

- Industry leading Wire Management Solutions
- Mounts available for all roof types
- Single Tool Installation
- All SnapNrack Module Clamps & Accessories are compatible with both rail profiles

Start Installing Ultra Rail Today

RESOURCES snapnrack.com/resources
DESIGN snapnrack.com/configurator
WHERE TO BUY snapnrack.com/where-to-buy

Quality. Innovative. Superior.

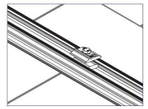
SnapNrack Solar Mounting Solutions are engineered to optimize material use and labor resources and improve overall installation quality and safety.

877-732-2860 www.snapnrack.com contact@snapnrack.com

Grounding Specifications

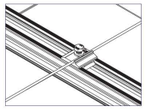
snapnrack.com

INSTALLATION INSTRUCTIONS - SNAPNRACK GROUND LUG



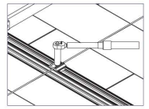
1) Snap the SnapNrack Ground Lug into the rail channel on **one rail per module row.**

Install Note:
SnapNrack Ground Lug may be used in side or top channel, and may be rotated 90 degrees relative to slot to facilitate running copper across top of rails.



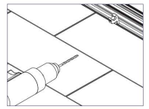
2) Place grounding conductor into slot underneath split ring washer.

Install Note:
SnapNrack Ground Lug only Listed for use with 6-12 AWG solid copper conductor.



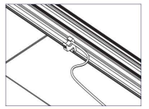
3) Tighten hardware to 16 ft-lbs.

INSTALLATION INSTRUCTIONS - ILSCO LAY-IN LUG

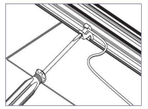


1) Drill and deburr a 1/4" hole in the back side of the rail for the Ilsco lug to attach to, place the bolt through the hole, and attach the lug assembly on **one rail per module row.**

Install Note:
Torque rail connection to 35 in-lbs.



2) Place grounding conductor into slot.



3) Tighten set screw per Ilsco's recommendation (see below).

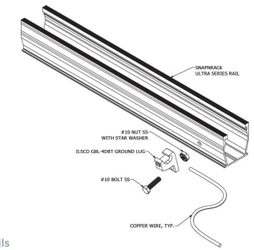
Install Note:
Torque set screw to 20 in-lbs for #10-#14 solid and stranded copper, 25 in-lbs for #8 stranded copper, and 35 in-lbs for #4-#6 stranded copper.

Note:
- System has been evaluated to a maximum overcurrent device (OCD) protection level of 20 Amps.
- Universal End Clamp (UEC) does not bond module to rail. Be sure to separately ground any modules that are only secured by UECs, especially during servicing.
- SnapNrack recommends that bare copper never come into contact with aluminum.
- SnapNrack Ground Lug: torque bolt to 16 ft-lbs. The Ground Lug may be used in side or top channel. It may be rotated 90 degrees relative to slot to facilitate running copper across top of rails.
- Grounding with a standard Ilsco GBL-4DBT Lug is a listed alternate and requires drilling of a hole in the rail.
- Ilsco hardware connection to rail: 5 ft-lbs. Torque for lug set screw: #10-#14 solid and stranded copper- 20 in-lbs, #8 stranded copper- 25 in-lbs, #4-#6 stranded copper- 35 in-lbs.

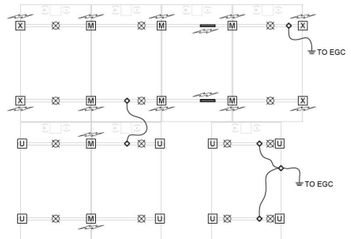
Grounding Specifications

snapnrack.com

Ilsco Lay-in Lug Assembly



Ground Path Details



RAIL | RAIL SPLICE | MOUNT | GROUND LUG | M = MIDCLAMP | X = X-END CLAMP | U = UNIVERSAL END CLAMP
GROUND PATH | EQUIPMENT GROUNDING CONDUCTOR

SnapNrack
Solar Mounting Solutions

snapnrack.com

SnapNrack SpeedSeal™ Foot

Patent Pending Lag Driven Sealant Solution for Ultra Rail

A New Generation of Roof Attachments

- Innovative design incorporates flashing reliability into a single roof attachment
- 100% waterproof solution
- Sealing cavity with compressible barrier secures sealant in place & fills voids

Maintain the Integrity of the Roof by Eliminating Disruption

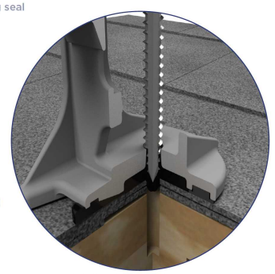
- Zero prying of shingles
- Zero removal of nails leaving holes in the roof
- Roof remains installed the way manufacturer meant it to be

Lag Driven Sealant Waterproofing

- Time Tested Roof Sealant provides lasting seal
- Sealant is compressed into cavity and lag hole as attachment is secured to rafter
- Active sealant solidifies bond if ever touched by liquid
- Technology passes UL 2582 Wind Driven Rain Test and ASTM E2140 Water Column Testing standards. Patent Pending.

Single Tool Installation

- SnapNrack was the first in the industry to develop a complete system that only requires a single tool. That tradition is continued as a ½" socket is still the only tool necessary to secure the mount as well as all other parts of the system.



Note: Sealant shown in white for illustration purposes only.

snapnrack.com

SnapNrack SpeedSeal™ Foot

Fastest Roof Attachment in Solar

- Lag straight to a structural member, no in-between components such as flashings or bases.
- Simply locate rafter, fill sealant cavity & secure to roof. *It's that simple!*

Integrated Flashings. No Questions.

- Sealant fills around lag screw keeping roof and structure sealed and intact
- No added holes from ripping up nails, staples and screws holding shingles on roof

Less Time. Less Parts. Less Tools.

- No more need for a pry bar to rip up shingles
- No more proprietary lag screws
- Single Tool installation with ½" socket

Total System Solution
One Tool. One Warranty.

- SnapNrack Ultra Rail is a straightforward intuitive install experience on the roof without compromising quality, aesthetics & safety, all supported by a 25 year warranty.
- Built-in Wire Management & Aesthetically pleasing features designed for Ultra Rail result in a long-lasting quality install that installers and homeowners love.

Certifications

SnapNrack Ultra Rail System has been evaluated by Underwriters Laboratories (UL) and Listed to UL/ANSI Standard 2703 for Mechanical Loading and Fire. Additionally it is listed to UL 2582 for wind-driven rain and ASTM 2140.

SnapNrack
Solar Mounting Solutions

877-732-2860 www.snapnrack.com contact@snapnrack.com

CAPE FEAR SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533

GC LIC. NO. : 65677
ELEC. LIC. NO. : U-33321

18.92 kW DC PV SYSTEM
WILLIAM CROCKER
74 Oakridge Duncan Rd,
Fuquay-Varina, NC 27526

RESOURCES

REVISION LIST

#	REV. DATE	DESC.

DATE:	**September 3, 2024**
DRAWN BY:	**JPN**

Sheet No.

R-02