

Michael E. Miele, PE

Licensed Professional Engineer

Licensed In New York, New Jersey, Connecticut & California

New York License # 079676

New Jersey License # 44042

Connecticut License # 23158

California License # 31508

September 19, 2023

Village of Upper Nyack Building Department

Office of The Building Inspector

9328 N Broadway

Upper Nyack, NY 10960

Re: Tor Newman – 207 Foss Drive, Nyack, NY 10960
Single Family Residence, Solar Panel Loading Certification
Village of Upper Nyack, County of Rockland, State of New York

Dear Building Department

I am the engineer of record for the above referenced project. I have prepared the attached plans dated July 26, 2023 that consists of the installation of (21) Q.PEAK DUO BLK ML-G10+365 solar panels at the above referenced location.

I can hereby certify that the existing roof structure combined with the additional weight of the solar panels meets the requirements of The 2020 Residential Code of New York State, Publication Date, November 2019.

The design loads were as follows,

Roof Design Load: 50psf live load

Wind Design Load: 130mph

No additional structural members were required.

The roof is currently framed with 2x6 true dimensional wood framing @ 16" O.C. w/knee wall. The roof structural members are in compliance with ASCE 7-16 for deflection and acceptable bending stress.

If you have any questions, please feel free to call me at any time. Thanks in advance.

Sincerely Yours,



Michael E. Miele, PE





50 MAIN STREET. #1000,
WHITE PLAINS, NY 10606
(914) 719-7786

NEWMAN RESIDENCE

207 FOSS DRIVE
NYACK, NY 10960
917-763-1065
S: 60.9 B: 2 L: 41

PROJECT DATA: #237347
 INVERTER: (21) ENPHASE IQ8PLUS-72-2-US
 MODULES: (21) Q.PEAK DUO BLK-G10+ 365
 RACKING: IRON RIDGE XR100
 WATTAGE: 7,665
 ROOF TYPE: COMPOSITION SHINGLES
 WIND LOAD: -25.2PSF @ 130MPH
 FASTENER: 5/16" DIA. 5" SS LAGS



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Licensed Professional Engineer
 33 QUAKER AVE. - PO Box 530
 CORNWALL, NY 12518
 TELEPHONE: (845) 629.9693
 EMAIL: MikeMielePE@gmail.com



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RENDERING
FRONT OF HOUSE

R-1



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RENDERING
OVERHEAD

R-2



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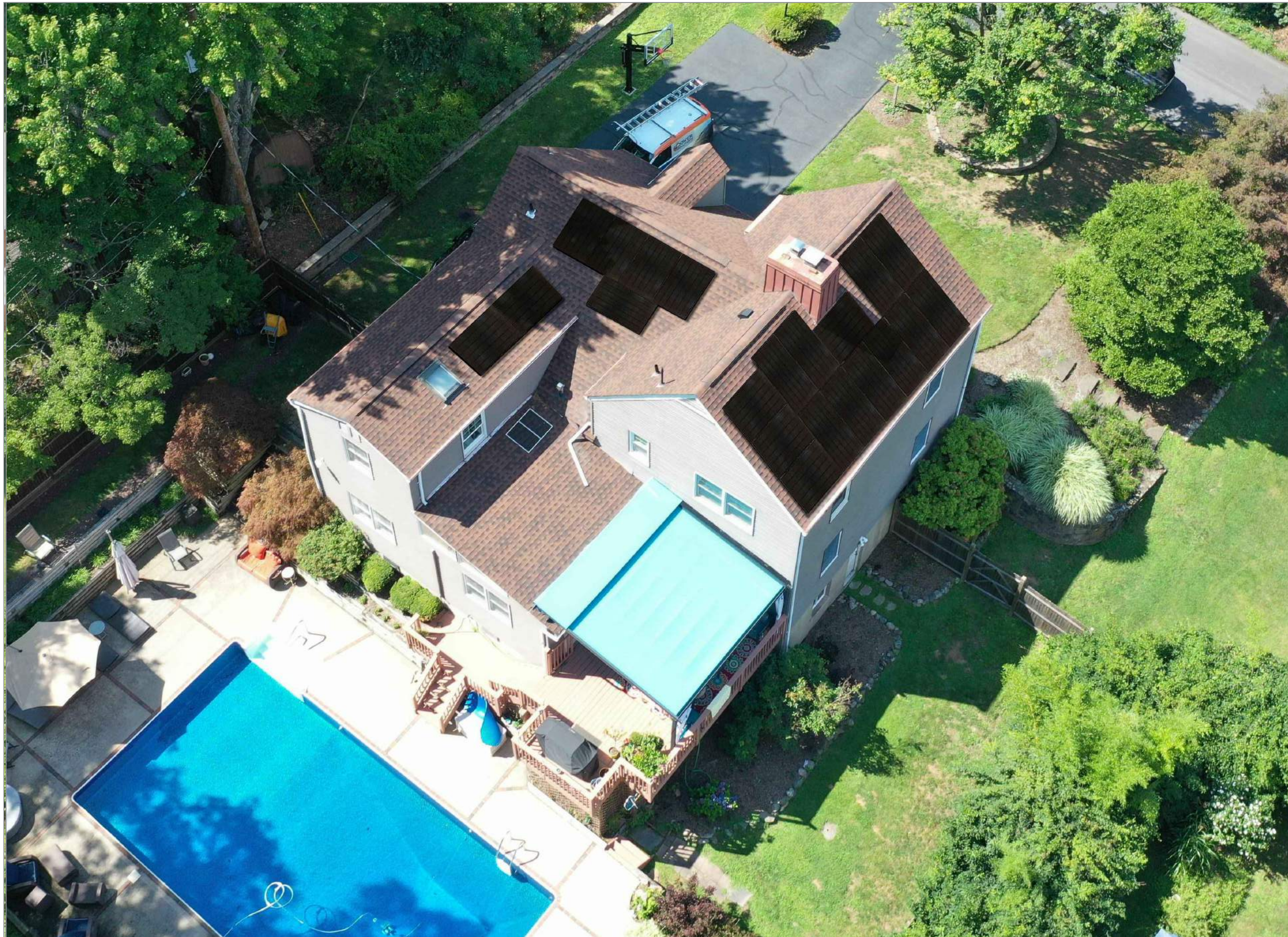
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RENDERING
FRONT BIRDS-EYE

R-3



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RENDERING
REAR BIRDS-EYE

R-4



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ELEVATION
FRONT OF HOUSE

A-1



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ELEVATION
WEST SIDE OF HOUSE

A-2





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ELEVATION
BACK OF HOUSE

A-3





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ELEVATION
EAST SIDE OF HOUSE

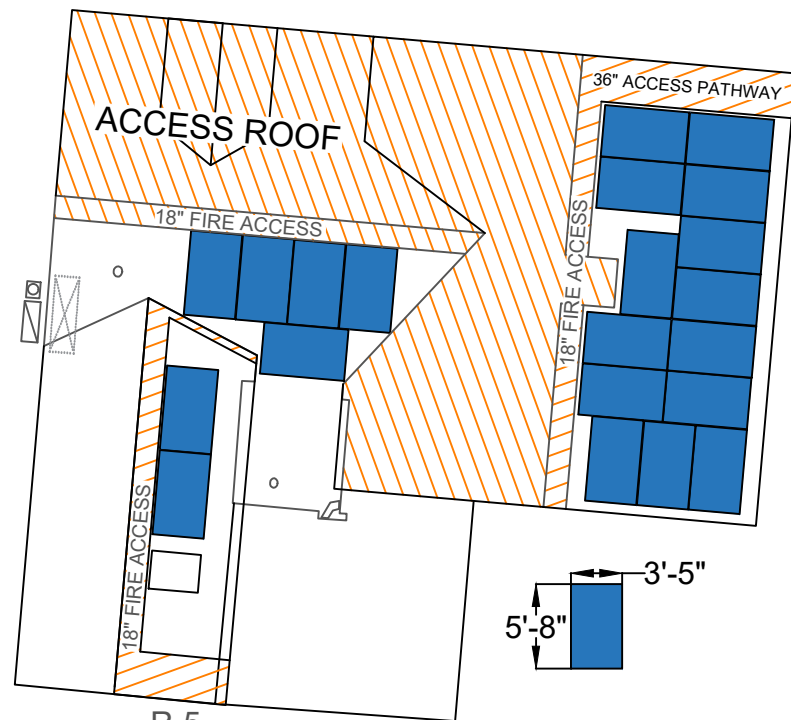
A-4





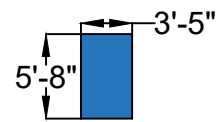
FRONT OF HOUSE

R-3
MODULES (5)
PITCH: 40°
AZIMUTH: 185°

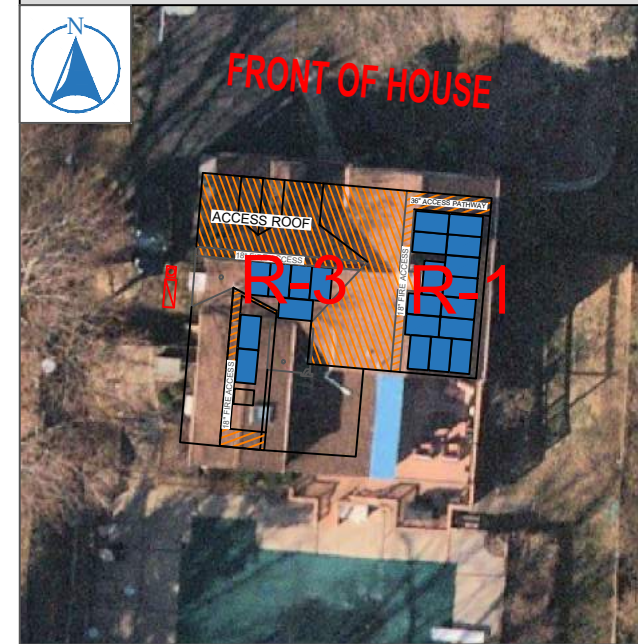


R-1
MODULES (14)
PITCH: 40°
AZIMUTH: 95°

R-5
MODULES (2)
PITCH: 20°
AZIMUTH: 93°



AERIAL



SHEET INDEX

- S-1 SITE PLAN
- S-2 DETAILS
- E-1 ELECTRICAL PLAN
- L-1 MOUNTING PLAN

GENERAL NOTES

- ENPHASE MICRO INVERTER LOCATED ON ROOF BEHIND EACH MODULE.
- FIRST RESPONDER ACCESS MAINTAINED AND FROM ADJACENT ROOF.
- WIRE RUN FROM ARRAY TO CONNECTION IS 40 FEET.
- COGEN DISCONNECT IS LOCATED ADJACENT TO UTILITY METER.
- LAYOUT SUBJECT TO CHANGE BASED ON SITE CONDITIONS AT DATE OF INSTALL

LEGEND

- MAIN SERVICE PANEL (INTERIOR)
- COGEN DISCONNECT
- UTILITY METER



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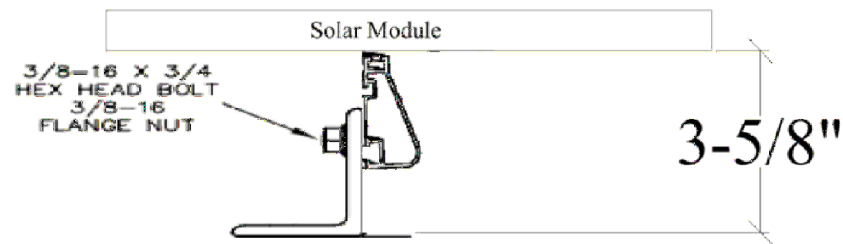
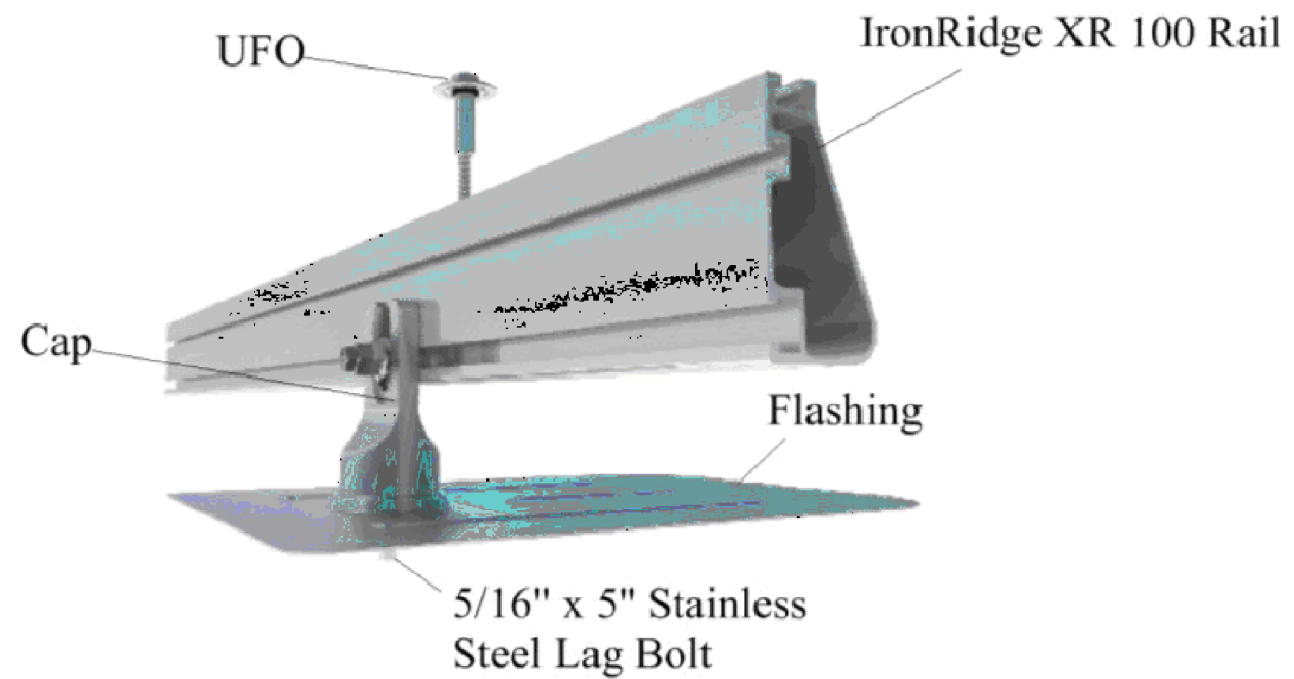
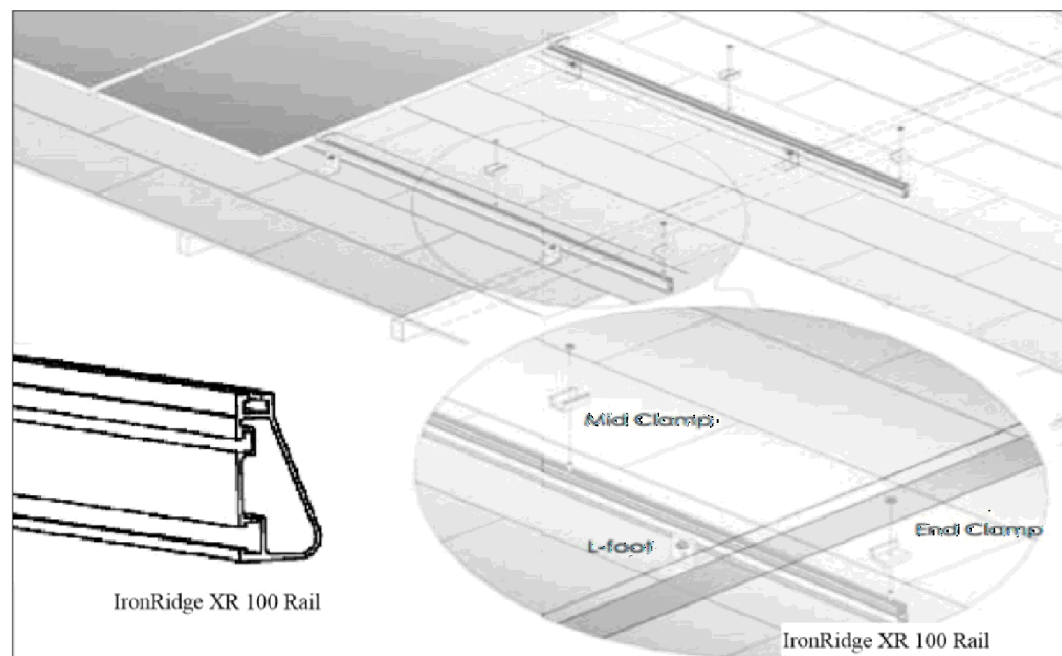
SITE PLAN
NOT TO SCALE

S-1

REPRESENTS ALL FIRE CLEARANCE INCLUDING ALTERNATIVE METHODS

FIRST RESPONDER ACCESS
MINIMUM OF 36" UNOBSTRUCTED AS PER
THE 2020 RESIDENTIAL CODE OF NYS

2020 RESIDENTIAL CODE OF NEW YORK STATE, 2020 ENERGY CONSERVATION CODE OF NEW YORK STATE,
VILLAGE OF UPPER NYACK CODE, 2017 NATIONAL ELECTRIC CODE. ASCE7-16.



GENERAL NOTES:

- L FEET ARE SECURED TO ROOF RAFTERS @ 80" O.C.
- USING 5/16" x 5" STAINLESS STEEL LAG BOLTS.
- SUBJECT ROOF HAS ONE LAYER.
- ALL PENETRATIONS ARE SEALED AND FLASHED.

ROOF	PITCH	RIDGE	RAFTERS	LENGTH	OVERHANG	NOTES
R1	40°	2"x8"	2"x6"@16"O.C.	14'-3"	9"	
R3	40°	2"x8"	2"x6"@16"O.C.	10'-10"	11"	KNEEWALL
R5	20°	2"x8"	2"x6"@16"O.C.	7'-6"	15"	



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DESIGNED AS PER ASCE 7-10
 MODULES MOUNTED FLUSH TO ROOF
 NO HIGHER THAN 6" ABOVE ROOF SURFACE

2020 RESIDENTIAL CODE OF NEW YORK STATE, 2020 ENERGY CONSERVATION CODE OF NEW YORK STATE,
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DETAILS

S-2

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PHOTOVOLTAICS:
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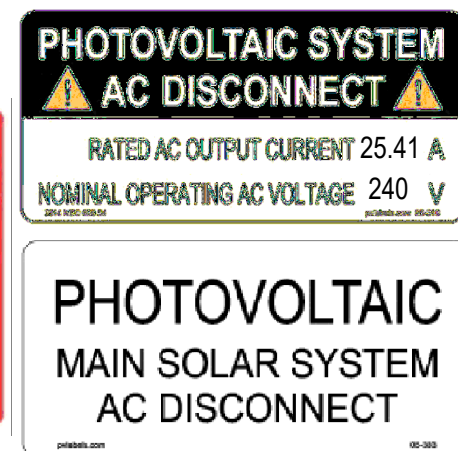
INVERTERS:
(21) ENPHASE IQ8PLUS-72-2-US

CIRCUITS:
(1) CIRCUIT OF (11) MODULES
(1) CIRCUIT OF (10) MODULES

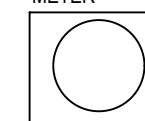
NEMA 3R
JUNCTION BOX

BLACK - L1
RED - L2
GREEN - GROUND

ENGAGE CABLE



METER



ACCT. #: 04250-55018
METER #: 701021880

LINE SIDE TAP

ATS

MAIN SERVICE
200A

AC DISTRIBUTION PANEL
OR SUB PANEL

60A FUSED SERVICE
RATED DISCONNECT

40A FUSE

125A LOAD CENTER

(1) - 20A BREAKER
PER CIRCUIT

DISCONNECT

ENVOY

#8 AWG THWN
(1) LINE 1
(1) LINE 2
(1) NEUTRAL
(1) EGC
IN 1" PVC CONDUIT

#6 AWG THWN
(1) LINE 1
(1) LINE 2
(1) NEUTRAL
(1) EGC
IN 1" PVC CONDUIT

#12 AWG THWN FOR HOME RUNS UNDER 100'
#10 AWG THWN FOR HOME RUNS OVER 100'
(1) LINE 1
(1) LINE 2
(1) GROUND
PER CIRCUIT
IN 1" OR 1 1/4" PVC CONDUIT



AC COMBINER:
1-PHASE, MAIN LUG LOAD CENTER, 125A

NOTE:
ALL WIRING TO MEET THE 2017 NEC AND 2020 ENERGY CODE
60A FUSED SERVICE RATED DISCONNECT

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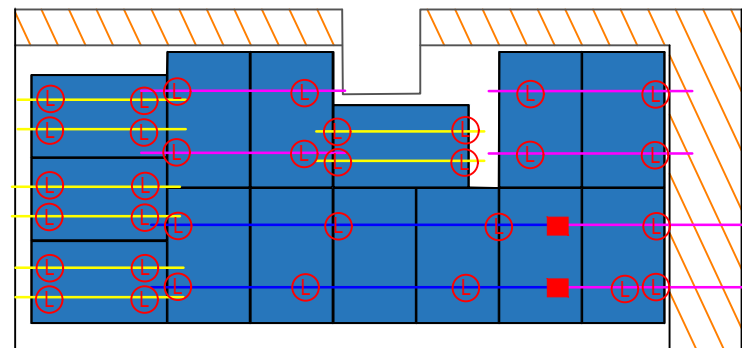
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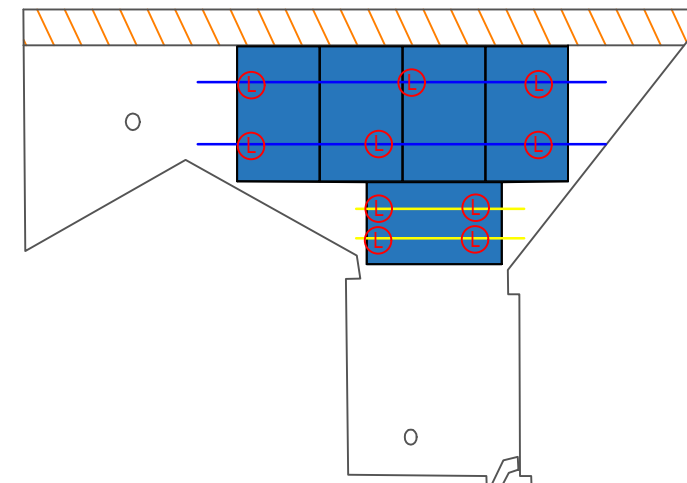
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MOUNTING PLAN

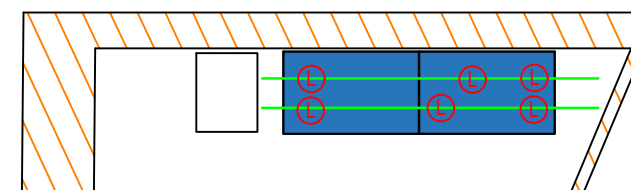
L-1



R-1
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PITCH: 40°
AZIMUTH: 95°



R-3
MODULES (5)
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AZIMUTH: 185°



R-5
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AZIMUTH: 93°



- SPLICE BAR 2
- ⊙ PENETRATIONS 49
- UFO 49
- 40MM SLEEVE 27
- END CAPS 27
- CONSUMPTION
- CRITTER GUARD 180'

powered by

Q.ANTUM DUO Z

Q.PEAK DUO BLK-G10+ 350-370

ENDURING HIGH
PERFORMANCE



Quality
Controlled PV
www.tuv.com
ID 1111232615



BREAKING THE 21% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.



THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY

Q CELLS 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.



INNOVATIVE ALL-WEATHER TECHNOLOGY

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



ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology¹, Hot-Spot Protect and Traceable Quality Tra.Q™.



EXTREME WEATHER RATING

High-tech aluminium alloy frame, certified for high snow (8100Pa) and wind loads (4000Pa).



A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty².



6 BUSBAR
CELL TECHNOLOGY

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

THE IDEAL SOLUTION FOR:



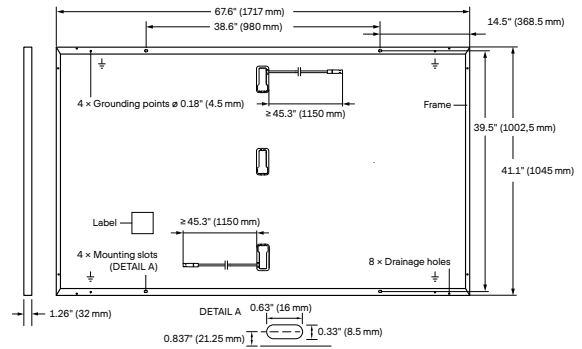
Rooftop arrays on
residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATIONS

Format	67.6 in × 41.1 in × 1.26 in (including frame) (1717 mm × 1045 mm × 32 mm)
Weight	43.8 lbs (19.9 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 × 20 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 × 1.26-2.36 × 0.59-0.71 in (53-101 × 32-60 × 15-18 mm), Protection class IP67, with bypass diodes
Cable	4 mm ² Solar cable; (+) ≥ 45.3 in (1150 mm), (+) ≥ 45.3 in (1150 mm)
Connector	Stäubli MC4; IP68



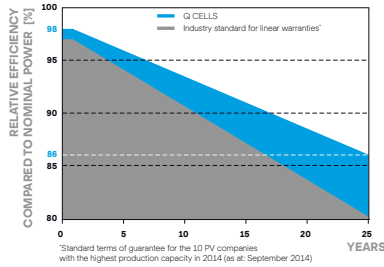
ELECTRICAL CHARACTERISTICS

POWER CLASS			350	355	360	365	370
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5 W / -0 W)							
Minimum	Power at MPP ¹	P _{MPP} [W]	350	355	360	365	370
	Short Circuit Current ¹	I _{SC} [A]	10.97	11.00	11.04	11.07	11.10
	Open Circuit Voltage ¹	V _{OC} [V]	41.11	41.14	41.18	41.21	41.24
	Current at MPP	I _{MPP} [A]	10.37	10.43	10.49	10.56	10.62
	Voltage at MPP	V _{MPP} [V]	33.76	34.03	34.31	34.58	34.84
	Efficiency ¹	η [%]	≥ 19.5	≥ 19.8	≥ 20.1	≥ 20.3	≥ 20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ²							
Minimum	Power at MPP	P _{MPP} [W]	262.6	266.3	270.1	273.8	277.6
	Short Circuit Current	I _{SC} [A]	8.84	8.87	8.89	8.92	8.95
	Open Circuit Voltage	V _{OC} [V]	38.77	38.80	38.83	38.86	38.90
	Current at MPP	I _{MPP} [A]	8.14	8.20	8.26	8.31	8.37
	Voltage at MPP	V _{MPP} [V]	32.24	32.48	32.71	32.94	33.17

¹Measurement 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 • *800 W/m², NMOT, spectrum AM 1.5

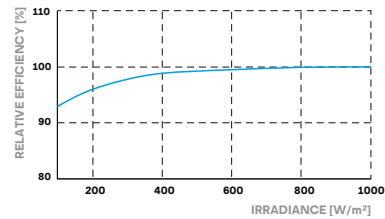
Q CELLS PERFORMANCE WARRANTY

PERFORMANCE AT LOW IRRADIANCE



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 Q CELLS sales organisation of your respective country.



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]	-0.35	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 / ft ²]	113 (5400 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 / ft ²]	169 (8100 Pa) / 84 (4000 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.





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.



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.



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.



Built for solar's toughest roofs.

IronRidge builds the strongest roof mounting system in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.



Strength Tested

All components evaluated for superior structural performance.



PE Certified

Pre-stamped engineering letters available in most states.



Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.



Design Software

Online tool generates a complete bill of materials in minutes.



Integrated Grounding

UL 2703 system eliminates separate module grounding components.



20 Year Warranty

Twice the protection offered by competitors.

XR Rails

XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear & black anod. finish

XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear & black anod. finish

XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Internal Splices

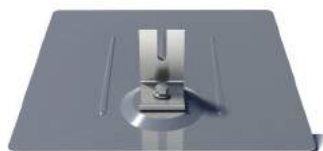


All rails use internal splices for seamless connections.

- Self-tapping screws
- Varying versions for rails
- Grounding Straps offered

Attachments

FlashFoot



Anchor, flash, and mount with all-in-one attachments.

- Ships with all hardware
- IBC & IRC compliant
- Certified with XR Rails

Slotted L-Feet



Drop-in design for rapid rail attachment.

- High-friction serrated face
- Heavy-duty profile shape
- Clear & black anod. finish

Standoffs



Raise flush or tilted systems to various heights.

- Works with vent flashing
- Ships pre-assembled
- 4" and 7" Lengths

Tilt Legs



Tilt assembly to desired angle, up to 45 degrees.

- Attaches directly to rail
- Ships with all hardware
- Fixed and adjustable

Clamps & Grounding

End Clamps



Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.22" to 2.3"
- Optional Under Clamps

Grounding Mid Clamps



Attach and ground modules in the middle of the rail.

- Parallel bonding T-bolt
- Reusable up to 10 times
- Mill & black stainless

T-Bolt Grounding Lugs



Ground system using the rail's top slot.

- Easy top-slot mounting
- Eliminates pre-drilling
- Swivels in any direction

Accessories



Provide a finished and organized look for rails.

- Snap-in Wire Clips
- Perfected End Caps
- UV-protected polymer

Free Resources



Design Assistant

Go from rough layout to fully engineered system. For free.

[Go to IronRidge.com/rm](http://IronRidge.com/rm)



NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

[Go to IronRidge.com/training](http://IronRidge.com/training)