RODNEY & LAURA CARPENTIER - 8.250kW DC, 6.380kW AC

SHEET CATALOG

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SCOPE OF WORK

GENERAL SYSTEM INFORMATION:
SYSTEM SIZE:
8250W DC, 6380W AC
MODULES:
(22) LG NEON LG375Q1C-V5
INVERTER:
(22)ENPHASE IQ7PLUS-72-2-US,
BRANCH DETAILS:
1X12, 1X10 ENPHASE BRANCHES

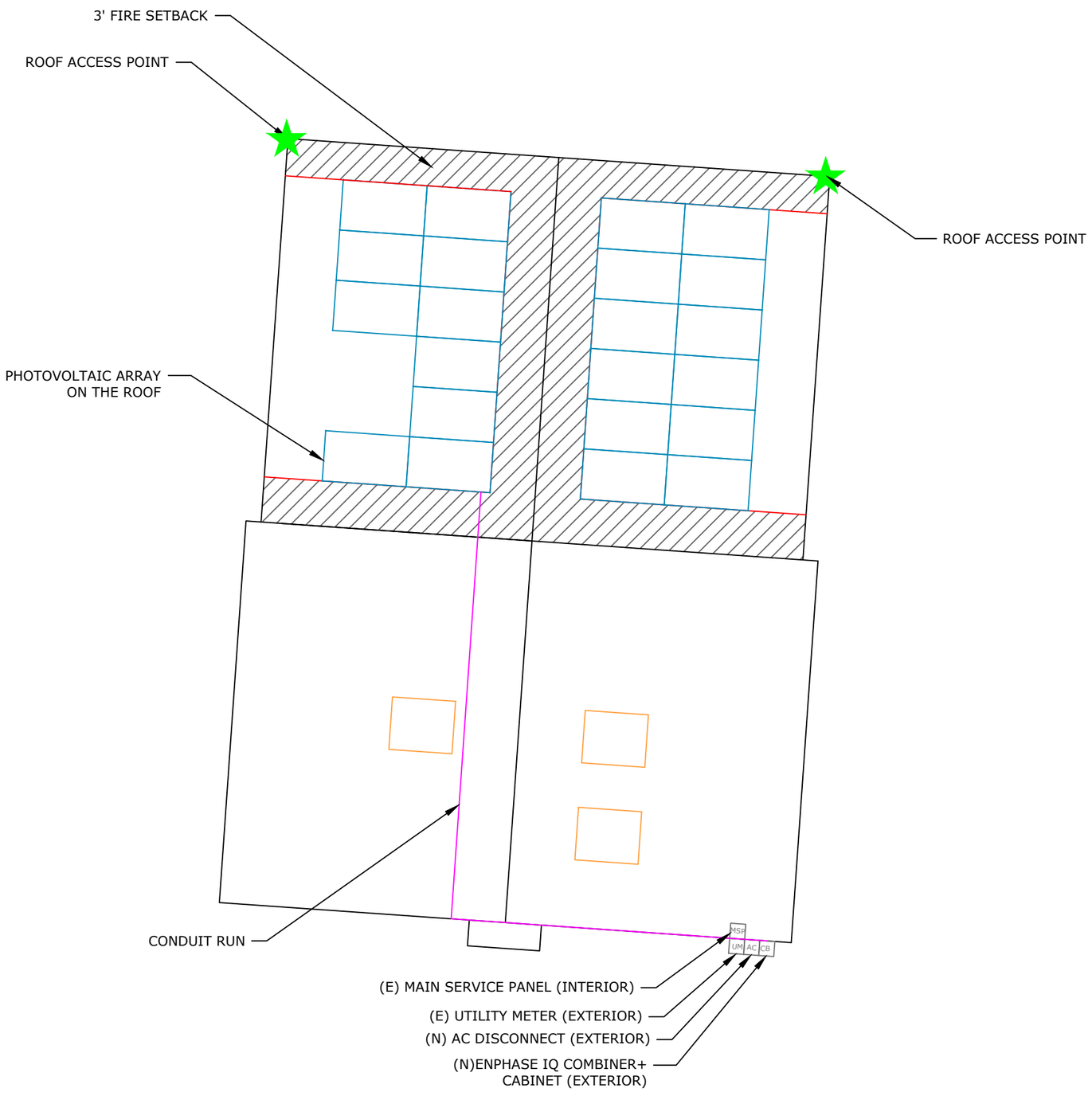
APPLICABLE CODES

- ELECTRIC CODE:NEC 2014
- FIRE CODE:IFC 2015
- BUILDING CODE: IBC 2015
- RESIDENTIAL CODE:IRC 2015

GENERAL NOTES

1.MODULES ARE LISTED UNDER UL 1703 AND CONFORM TO THE STANDARDS.
2.INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
3.DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM AND THE ACTUAL SITE CONDITION MIGHT VARY.
4.WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26.
5.ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL/ SERVICE EQUIPMENT.
6.ALL CONDUCTORS SHALL BE 600V, 75°C STANDARD COPPER UNLESS OTHERWISE NOTED.
7.WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
8.THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND/OR THE UTILITY.
9.ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS.
10.PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING

SITE PLAN LAYOUT



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

VICINITY MAP

Tri-State Solar Services
COMPLETE SOLAR ROOFING SERVICES

LICENSE NUMBER& CLASS:HOME IMPROVEMENT/ H-12588

CUSTOMER INFORMATION

NAME: RODNEY & LAURA CARPENTIER

ADDRESS:508 W POND RD, NYACK, NY 10960

41.110690, -73.926112
APN : 392-00-160-922

AHJ:NY - VILLAGE OF UPPER NYACK

UTILITY:O&R

PRN NUMBER: TSS-008477

ILLUMINE i
Because quality matters

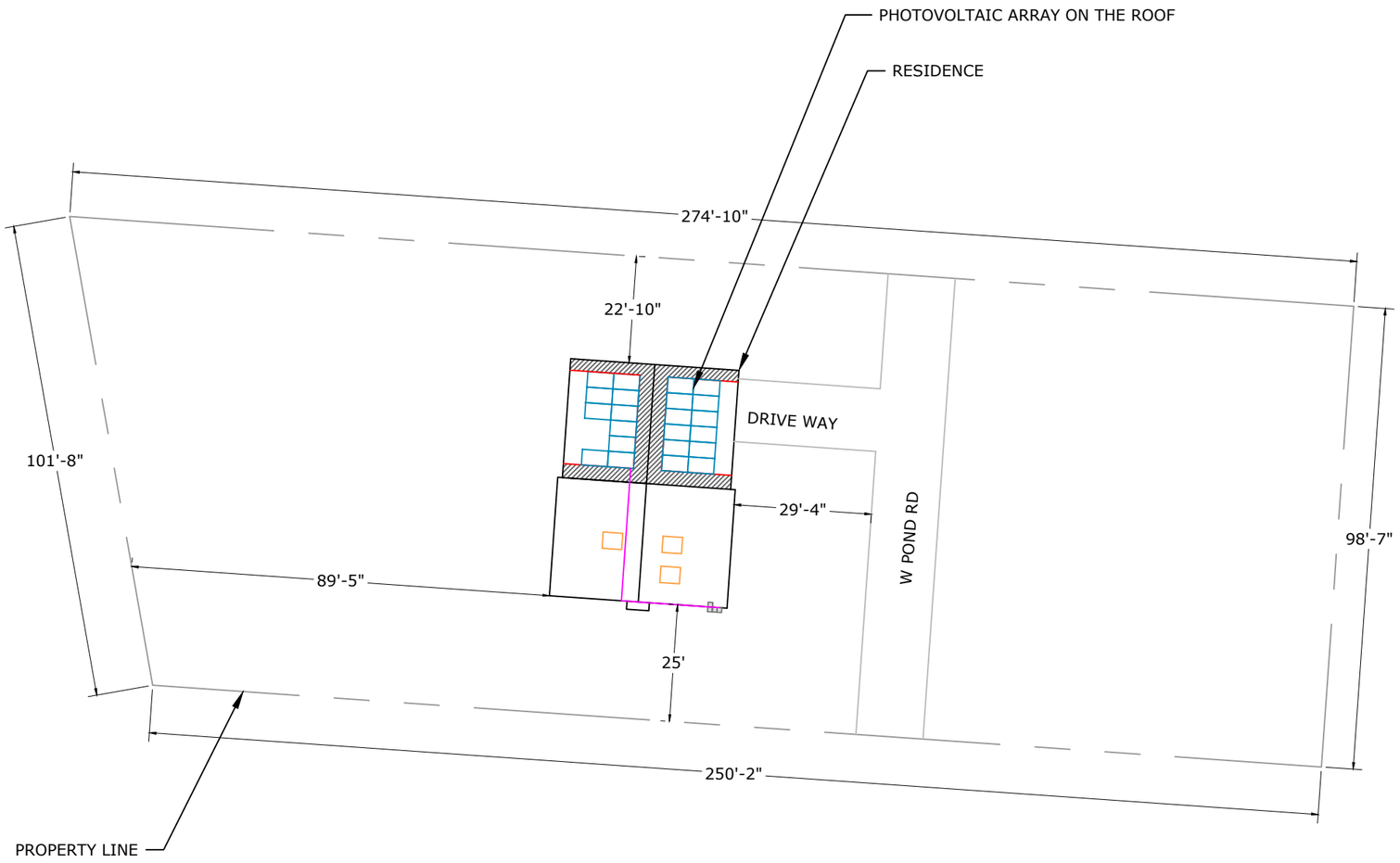
COVER PAGE 1

DESIGNER/CHECKED BY:
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	T-1

RODNEY & LAURA CARPENTIER - 8.250kW DC, 6.380kW AC

SITE PLAN LAYOUT



SCALE:1"=30'-0"

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COVER PAGE 2

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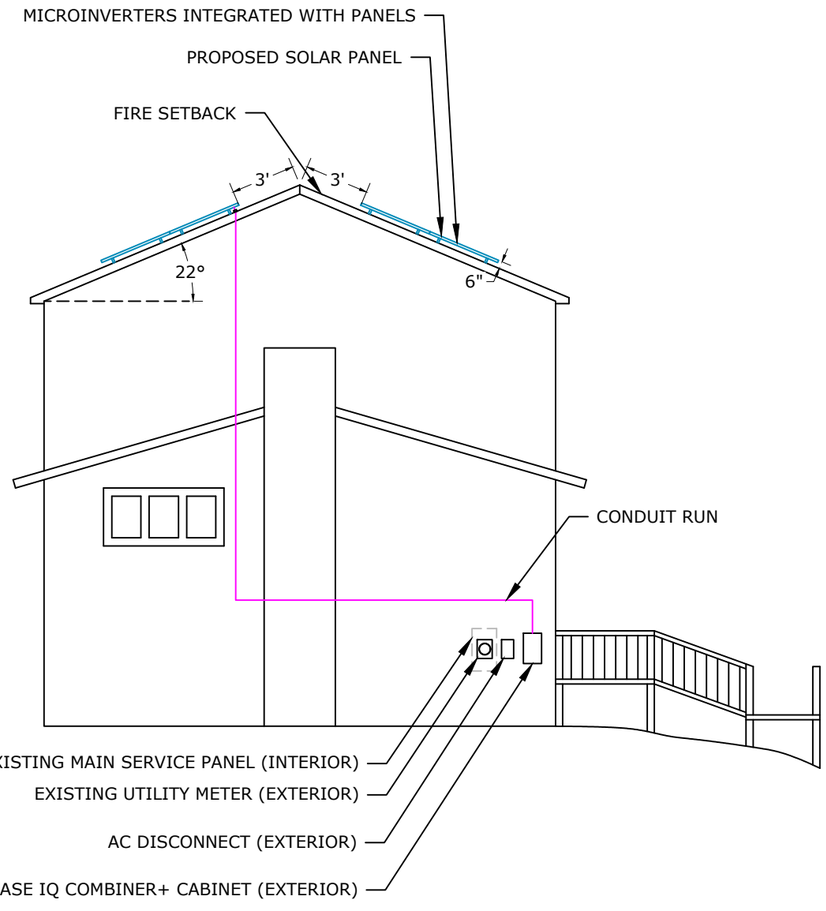
DATE:3/9/21	T-2

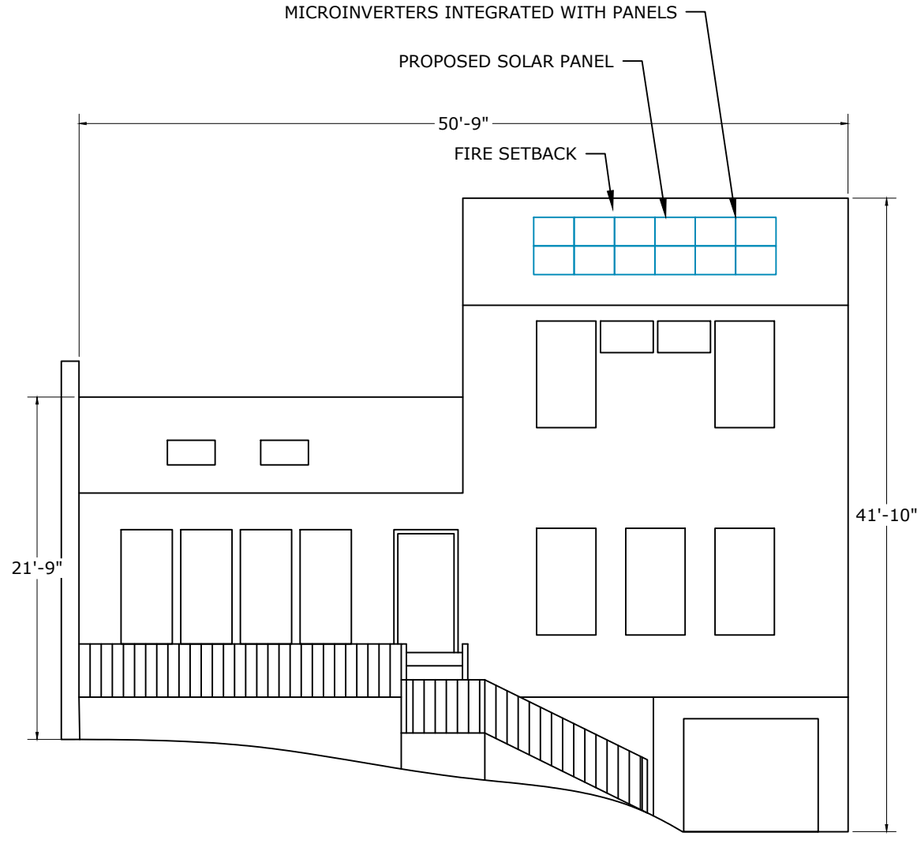
RODNEY & LAURA CARPENTIER - 8.250kW DC, 6.380kW AC

ELEVATION VIEW

LEFT SIDE OF THE HOUSE:



FRONT OF THE HOUSE:



SCALE:1"=10'-0"

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ELEVATION VIEW

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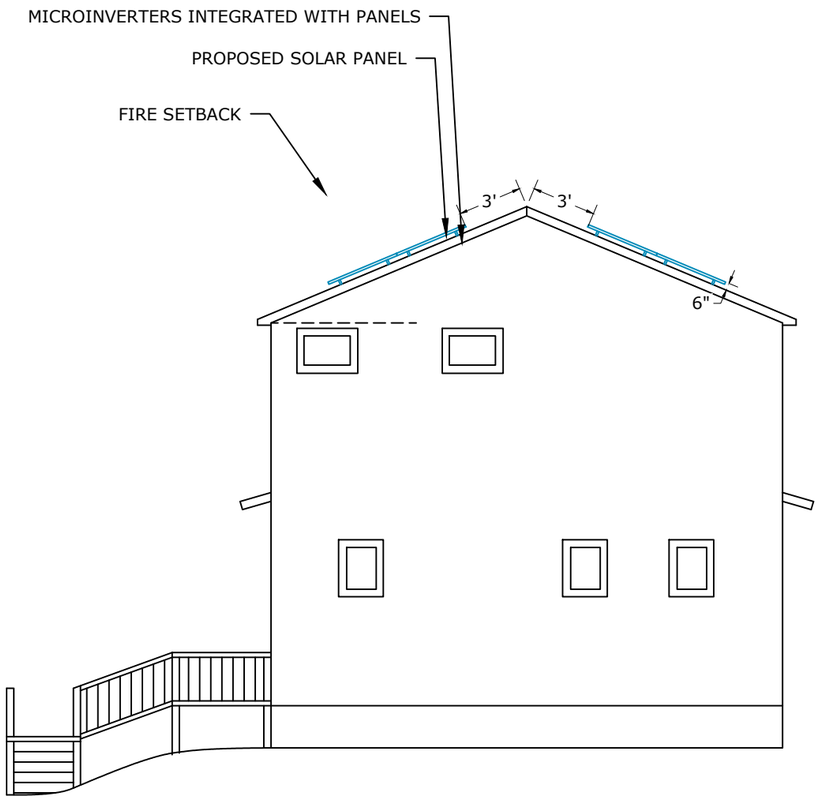
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	T-3

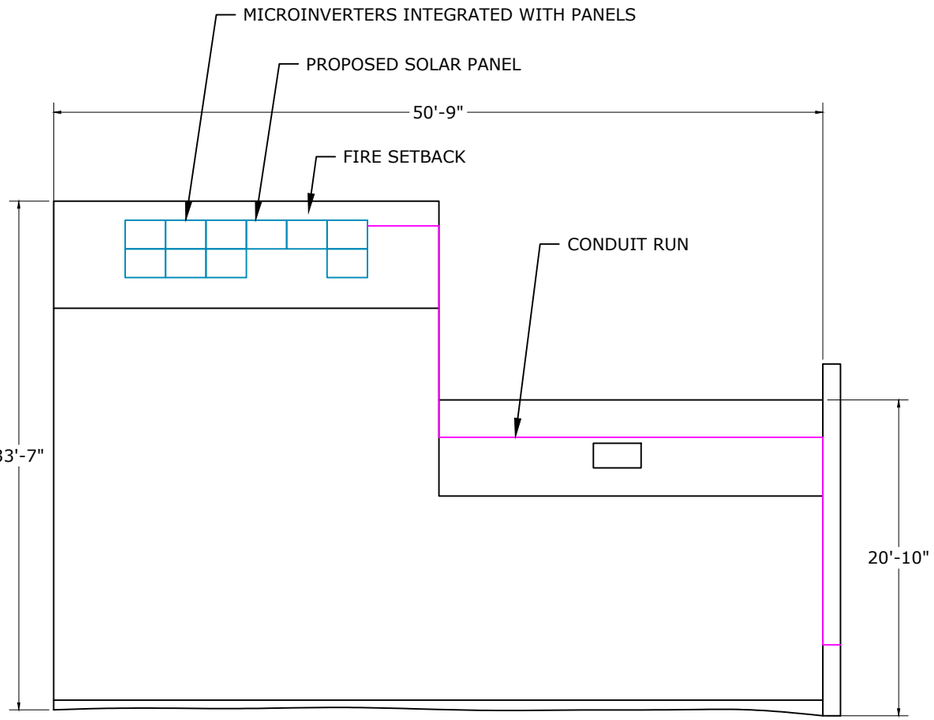
RODNEY & LAURA CARPENTIER - 8.250kW DC, 6.380kW AC

ELEVATION VIEW

RIGHT SIDE OF THE HOUSE:



BACK OF THE HOUSE:



SCALE:1"=10'-0"

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ELEVATION VIEW

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INSTALLATION NOTES

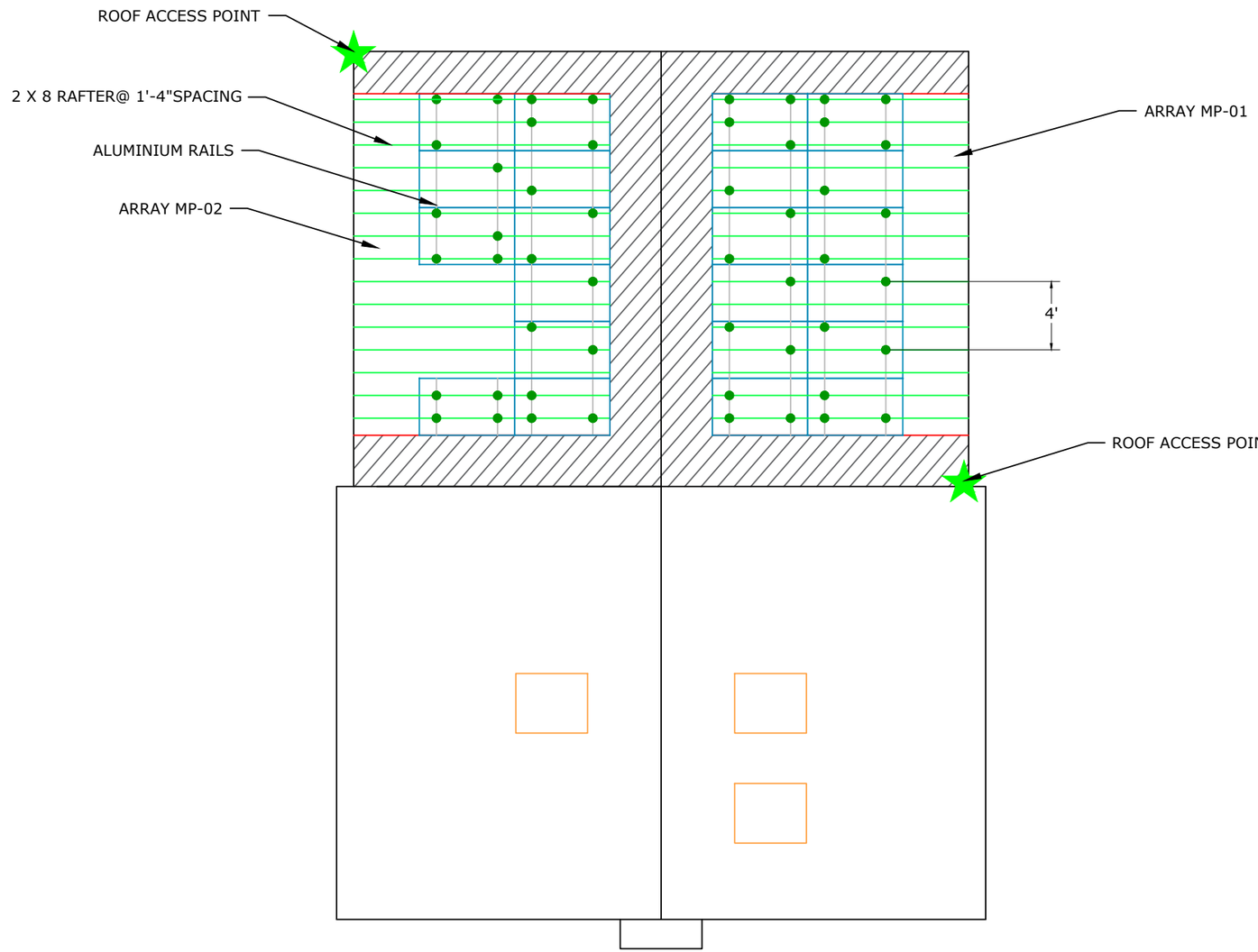
1.STRUCTURAL ROOF MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED BY THE CONTRACTOR WHEN LAG BOLT PENETRATION OR MECHANICAL ATTACHMENT TO THE STRUCTURE IS REQUIRED.
2.ROOFTOP PENETRATIONS FOR SOLAR RACKING WILL BE COMPLETED AND SEALED WITH APPROVED SEALANT PER CODE BY A LICENSED CONTRACTOR.
3.LAGS MUST HAVE A MINIMUM 2.5" THREAD EMBEDMENT INTO THE STRUCTURAL MEMBER.
4.ALL PV RACKING ATTACHMENTS SHALL BE STAGGERED BY ROW BETWEEN THE ROOF FRAMING MEMBERS AS NECESSARY.
5.ROOF MOUNTED STANDARD RAIL REQUIRES ONE THERMAL EXPANSION GAP FOR EVERY RUN OF RAIL GREATER THAN 40'.
6.ALL CONDUCTORS AND CONDUITS ON THE ROOF SHALL BE MINIMUM 1-1/2" ABOVE THE ROOF SURFACE (INCLUDING CABLES UNDERNEATH MODULES AND RACKING).
7.THE PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL OR BUILDING ROOF VENTS.

ROOF ACCESS PATHWAYS AND SETBACKS: IFC 605.11.1.2.1 SIZE OF SOLAR PHOTOVOLTAIC ARRAY.
EACH PHOTOVOLTAIC ARRAY SHALL BE LIMITED TO 150 FEET (45 720 MM) BY 150 FEET (45 720 MM). MULTIPLE ARRAYS SHALL BE SEPARATED BY A 3-FOOT-WIDE (914 MM) CLEAR ACCESS PATHWAY.
IFC 605.11.1.2.2 HIP ROOF LAYOUTS.
PANELS AND MODULES INSTALLED ON GROUP R-3 BUILDINGS WITH HIP ROOF LAYOUTS SHALL BE LOCATED IN A MANNER THAT PROVIDES A 3-FOOT-WIDE (914 MM) CLEAR ACCESS PATHWAY FROM THE EAVE TO THE RIDGE ON EACH ROOF SLOPE WHERE PANELS AND MODULES ARE LOCATED. THE ACCESS PATHWAY SHALL BE AT A LOCATION ON THE BUILDING CAPABLE OF SUPPORTING THE FIRE FIGHTERS ACCESSING THE ROOF.
IFC 605.11.1.2.3 SINGLE-RIDGE ROOFS.
PANELS AND MODULES INSTALLED ON GROUP R-3 BUILDINGS WITH A SINGLE RIDGE SHALL BE LOCATED IN A MANNER THAT PROVIDES TWO, 3-FOOT-WIDE (914 MM) ACCESS PATHWAYS FROM THE EAVE TO THE RIDGE ON EACH ROOF SLOPE WHERE PANELS AND MODULES ARE LOCATED.
IFC 605.11.1.2.4 ROOFS WITH HIPS AND VALLEYS. PANELS AND MODULES INSTALLED ON GROUP R-3 BUILDINGS WITH ROOF HIPS AND VALLEYS SHALL NOT BE LOCATED CLOSER THAN 18 INCHES (457 MM) TO A HIP OR A VALLEY WHERE PANELS/MODULES ARE TO BE PLACED ON BOTH SIDES OF A HIP OR VALLEY. WHERE PANELS ARE TO BE LOCATED ON ONLY ONE SIDE OF A HIP OR VALLEY THAT IS OF EQUAL LENGTH, THE PANELS SHALL BE PERMITTED TO BE PLACED DIRECTLY ADJACENT TO THE HIP OR VALLEY.
IFC 605.11.1.2.5 ALLOWANCE FOR SMOKE VENTILATION OPERATIONS.
PANELS AND MODULES INSTALLED ON GROUP R-3 BUILDINGS SHALL BE LOCATED NOT LESS THAN 3 FEET (914 MM) FROM THE RIDGE IN ORDER TO ALLOW FOR FIRE DEPARTMENT SMOKE VENTILATION OPERATIONS.

SITE INFORMATION - WIND SPEED: 115 MPH AND SNOW LOAD: 20 PSF

SR. NO	AZIMUTH	PITCH	NO. OF MODULES	ARRAY AREA (SQ. FT.)	ROOF TYPE	ATTACHMENT	ROOF EXPOSURE	FRAME TYPE	FRAME SIZE	FRAME SPACING	MAX RAIL SPAN	OVER HANG
MP-01	94°	22°	12	223.1	COMPOSITION SHINGLE	FLASH FOOT	ATTIC	RAFTER	2 X 8	1'-4"	4'-0"	2'-0"
MP-02	274°	22°	10	185.9	COMPOSITION SHINGLE	FLASH FOOT	ATTIC	RAFTER	2 X 8	1'-4"	4'-0"	2'-0"

NOTE:PENETRATIONS ARE STAGGERED



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

N

AERIAL VIEW

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AHJ:NY - VILLAGE OF UPPER NYACK

UTILITY:O&R

PRN NUMBER: TSS-008477

ILLUMINE i
Because quality matters

MOUNTING DETAIL

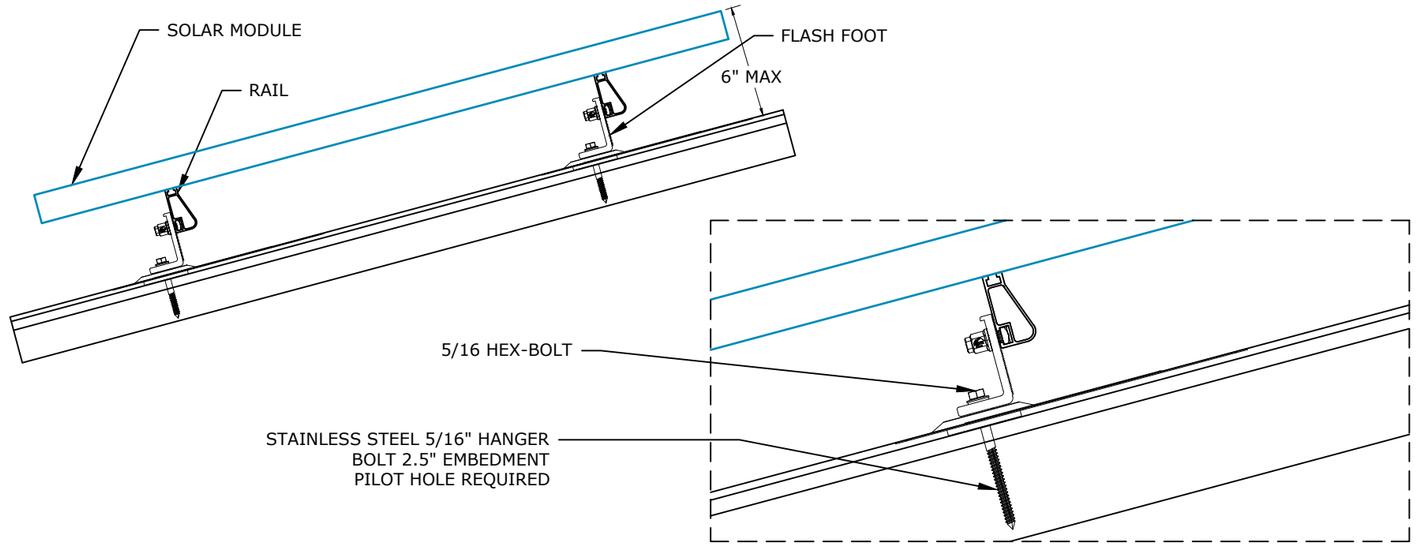
DESIGNER/CHECKED BY:
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	M-1

DEAD LOAD CALCULATIONS

BOM	QUANTITY	LBS/UNIT	TOTAL WEIGHT (LBS)
MODULES	22	38.58	848.76
MID-CLAMP	34	0.050	1.70
END-CLAMP	20	0.050	1.00
RAIL LENGTH	147	0.680	99.96
SPLICE BAR	6	0.360	2.16
FLASH FOOT	51	1.35	68.85
MICRO-INVERTER	22	2.38	52.36
TOTAL WEIGHT OF THE SYSTEM (LBS)			1074.79
TOTAL ARRAY AREA ON THE ROOF (SQ. FT.)			408.96
WEIGHT PER SQ. FT.(LBS)			2.63
WEIGHT PER PENETRATION (LBS)			21.07

ATTACHMENT DETAIL-FLASH FOOT



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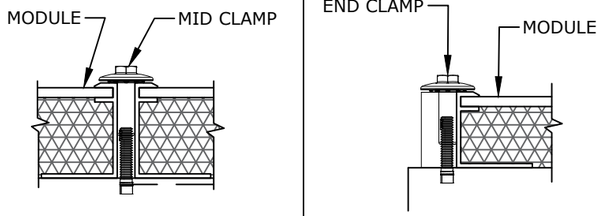
MODULES DATA

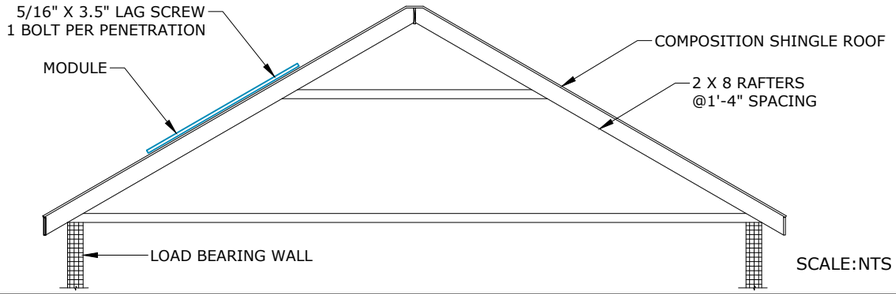
LG NEON LG375Q1C-V5

MODULE DIMS	66.92"x 40"x1.57"
LAG SCREWS	5/16"x3.5":2.5"MIN EMBEDMENT

MID-CLAMP AND END-CLAMP ANATOMY



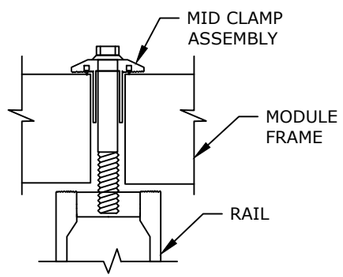
ROOF FRAMING DETAILS



SCALE:NTS

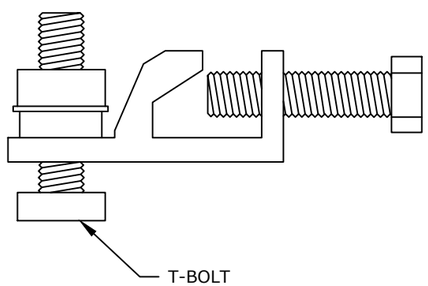
GROUNDING DETAILS

MODULE TO MODULE & MODULE TO RAIL

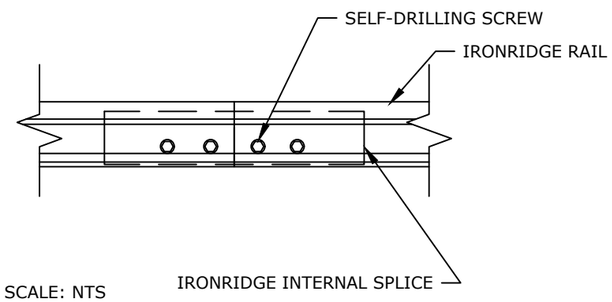


GROUNDING MID-CLAMP
SCALE: NTS

GROUNDING LUG



RAIL TO RAIL



SCALE: NTS

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STRUCTURAL DETAIL

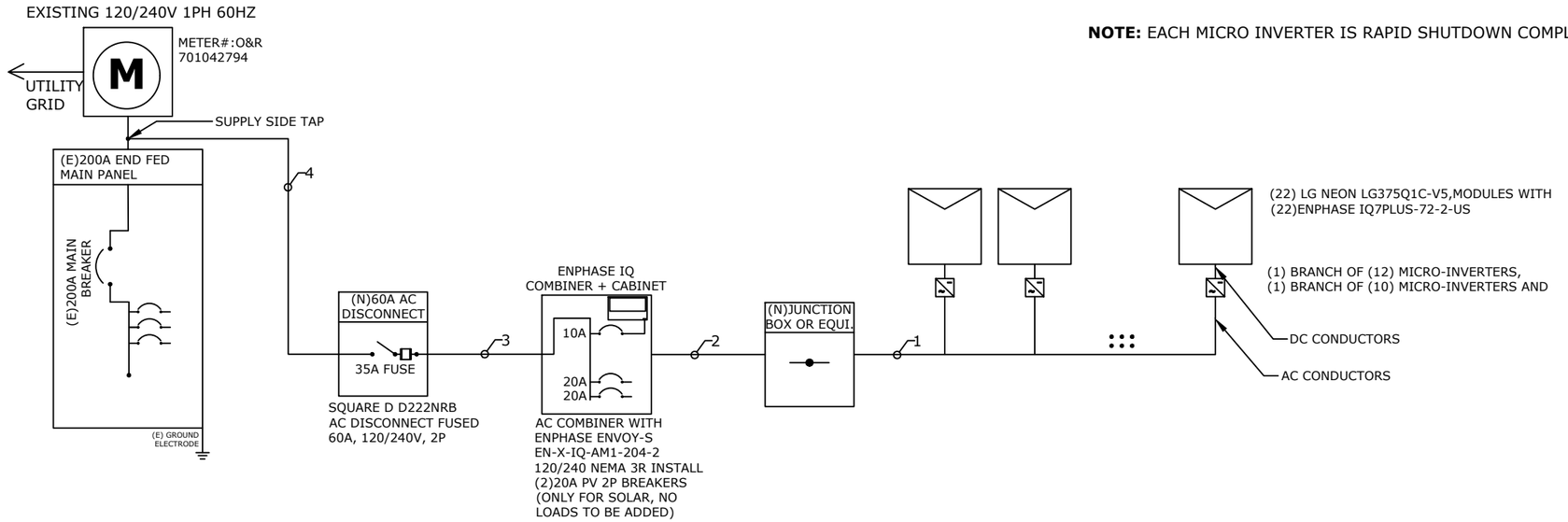
DESIGNER/CHECKED BY:
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	M-2

SINGLE LINE DIAGRAM: DC SYSTEM SIZE - 8250W, AC SYSTEM SIZE - 6380W

MICRO INVERTER SPECIFICATIONS	
MODEL	ENPHASE IQ7PLUS-72-2-US
POWER RATING	290W
MAX OUTPUT CURRENT	1.21A
CEC WEIGHTED EFFICIENCY	97%
MAX NO OF MICRO INVERTERS/BRANCH	13
MAX DC VOLTAGE	60V

MODULE SPECIFICATION	
MODEL	LG NEON LG375Q1C-V5
MODULE POWER @ STC	375W
OPEN CIRCUIT VOLTAGE:**Voc**	42.8V
MAX POWER VOLTAGE:**Vmp**	37.2V
SHORT CIRCUIT VOLTAGE:**Isc**	10.83A
MAX POWER CURRENT:**Imp**	10.09A



NOTE: EACH MICRO INVERTER IS RAPID SHUTDOWN COMPLIANT

CONDUIT SCHEDULE				
TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(2) 12AWG ENGAGE CABLE PER BRANCH CIRCUIT	NONE	(1) 12AWG ENGAGE CABLE
2	3/4"EMT OR EQUIV	(4) 10AWG THHN/THWN-2	NONE	(1) 10AWG THHN/THWN-2
3	3/4"EMT OR EQUIV	(2) 8 AWG THHN/THWN-2	(1)8 AWG THHN/THWN-2	(1) 10AWG THHN/THWN-2
4	3/4"EMT OR EQUIV	(2) 6 AWG THHN/THWN-2	(1)6 AWG THHN/THWN-2	(1) 10AWG THHN/THWN-2

NOTE:
MAIN PANEL RATING:200A, MAIN BREAKER RATING:200A
LINE SIDE TAP: 100% ALLOWABLE BACKFEED IS =200A

OCPD CALCULATIONS:
INVERTER OVERCURRENT PROTECTION= INVERTER O/P I X CONTINUOUS LOAD(1.25)
=1.21 x1.25x22=33.28A=>PV BREAKER = 35A
TOTAL REQUIRED PV BREAKER SIZE / FUSE SIZE=>35A PV BREAKER

ELECTRICAL CALCULATIONS

AC WIRE SIZING CALCULATIONS BASED OF FOLLOWING EQUATIONS >>

- REQUIRED CONDUCTOR AMPACITY: INVERTER OUTPUT CURRENT X #OF INVERTERSXMAX CURRENT PER 690.8(A)(3)X125% PER 690.8(B)(2)(A)
- CORRECTED AMPACITY CALCULATIONS:AMPACITY X TEMPERATURE DERATE FACTOR X CONDUIT FILL DERATE = DERATED CONDUCTOR AMPACITY
- DERATED CONDUCTOR AMPACITY CHECK: MAX CURRENT PER 690.8(B)(2)(2) < DERATED CONDUCTOR AMPACITY

AC WIRE CALCULATIONS:- MATERIAL:COPPER & TEMPERATURE RATING:90°C

TAG ID	REQUIRED CONDUCTOR AMPACITY									CORRECTED AMPACITY CALCULATION							DERATED CONDUCTOR AMPACITY CHECK			
1	1.21	X	12	=	14.52	X	1.25	=	18.15A	30	X	0.87	X	1	=	26.10A	18.15A	<	26.10A
2	1.21	X	12	=	14.52	X	1.25	=	18.15A	40	X	0.87	X	1	=	34.80A	18.15A	<	34.80A
3	1.21	X	22	=	26.62	X	1.25	=	33.28A	55	X	0.87	X	1	=	47.85A	33.28A	<	47.85A
4	1.21	X	22	=	26.62	X	1.25	=	33.28A	75	X	0.87	X	1	=	65.25A	33.28A	<	65.25A

ELECTRICAL NOTES

1.CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.0(D).
2.CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.8(C).
3.MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
4.ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
5.BREAKER/FUSE SIZES CONFORMS TO NEC 240.6 CODE SECTION.
6.AC GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC 250.66.
7.AMBIENT TEMPERATURE CORRECTION FACTOR IS BASED ON NEC 690.31(C).
8.AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON NEC 310.15(B)(2)(C).
9.MAX. SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7.
10.CONDUCTORS ARE SIZED PER WIRE AMPACITY TABLE NEC 310.16.

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SINGLE LINE DIAGRAM

DESIGNER/CHECKED BY:
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SCALE:AS NOTED	REV:A
DATE:3/9/21	E-1

WARNING PLACARD

⚠ WARNING

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

LABEL LOCATION
DC DISCONNECT,INVERTER
[PER CODE: NEC 690.35(F)]
[To be used when inverter is ungrounded]

⚠ WARNING

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

DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

LABEL LOCATION
AC DISCONNECT,POINT OF INTERCONNECTION
[PER CODE: NEC 690.17(E)]

⚠ WARNING

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

LABEL LOCATION
AC DISCONNECT,POINT OF INTERCONNECTION
[PER CODE: NEC 690.17(E)]

WARNING-Electric Shock Hazard
No User Serviceable Parts inside
Contact authorized service provide for assistance

LABEL LOCATION
INVERTER, JUNCTION BOXES(ROOF),
AC DISCONNECT
[PER CODE: NEC 690.13.G.3 & NEC 690.13.G.4]

WARNING:PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION
CONDUIT, COMBINER BOX
[PER CODE: NEC690.31(G)(3)(4) & NEC 690.13(G)(4)]

PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH
RATED AC OPERATING CURRENT **26.62** AMPS AC
AC NOMINAL OPERATING VOLTAGE 240 VAC

LABEL LOCATION
AC DISCONNECT , POINT OF INTERCONNECTION
[PER CODE: NEC 690.54]

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVER-CURRENT DEVICE

LABEL LOCATION
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(D)(7)
[Not Required if Panel board is rated not less than sum of ampere ratings of all overcurrent devices supplying it]

CAUTION: SOLAR CIRCUIT

LABEL LOCATION
MARKINGS PLACED ON ALL INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLES AT LEAST EVERY 10 FT, AT TURNS AND ABOVE/BELOW PENETRATIONS AND ALL COMBINER/JUNCTION BOXES.
(PER CODE: IFC605.11.1.4)

SOLAR DISCONNECT

LABEL LOCATION
DISCONNECT, POINT OF INTERCONNECTION
[PER CODE: NEC690.13(B)]

⚠ WARNING
DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION
POINT OF INTERCONNECTION
[PER CODE: NEC705.12(D)(4)]

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

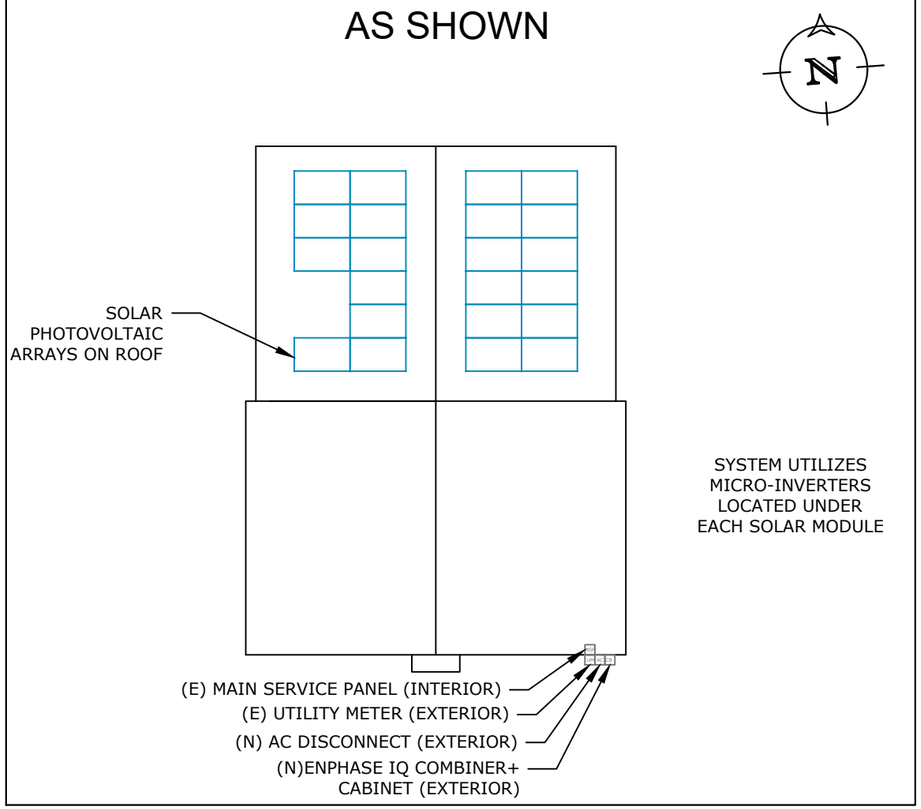
LABEL LOCATION
WEATHER RESISTANT MATERIAL, DURABLE ADHESDIVE, UL969 AS STANDARD TO WEATHER RATING (UL LISTING OF MARKINGS NOT REQUIRED), MIN ⅜" LETTER HEIGHT ARIAL OR SIMILAR FONT NON-BOLD,PLACED WITHIN THE MAIN SERVICE DISCONNECT,PLACED ON THE OUTSIDE OF THE COVER WHEN DISCONNECT IS OPERATED WITH THE SERVICE PANEL CLOSED.
(PWER CODE: NEC690.15 ,690.13(B))

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

LABEL LOCATION
AC DISCONNECT , DC DISCONNECT,POINT OF INTERCONNECTION
(PER CODE: NEC690.56(C))

WARNING: ⚠

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN



ALL PLACARDS SHALL BE OF WEATHER PROOF CONSTRUCTION, BACKGROUND ON ALL PLACARDS SHALL BE RED WITH WHITE LETTERING U.O.N.
PLACARD SHALL BE MOUNTED DIRECTLY ON THE EXISTING UTILITY ELECTRICAL SERVICE.
FASTENERS APPROVED BY THE LOCAL JURISDICTION

Tri-State Solar Services
COMPLETE SOLAR ROOFING SERVICES

LICENSE NUMBER& CLASS:HOME IMPROVEMENT/ H-12588

CUSTOMER INFORMATION

NAME: RODNEY & LAURA CARPENTIER

ADDRESS:508 W POND RD, NYACK, NY 10960

41.110690, -73.926112
APN : 392-00-160-922

AHJ:NY - VILLAGE OF UPPER NYACK

UTILITY:O&R

PRN NUMBER: TSS-008477

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Because quality matters

WARNING PLACARDS

DESIGNER/CHECKED BY:
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	PL-1

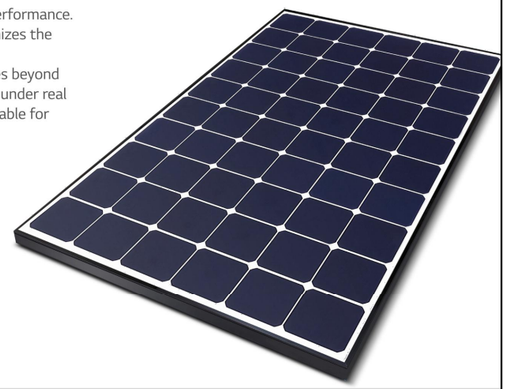
SPEC SHEET

LG NeON®R

60

380W I 375W I 370W I 365W

LG NeON® R is powerful solar module that provides world-class performance. A new cell structure that eliminates electrodes on the front maximizes the utilization of light and enhances reliability.
LG NeON® R is a result of LG's efforts to increase customer's values beyond efficiency. LG NeON® R features enhanced durability, performance under real -world conditions, an enhanced warranty and aesthetic design suitable for roofs.



Feature

Aesthetic Roof

LG NeON® R has been designed with aesthetics in mind: the lack of any electrodes on the front creates an improved, modern aesthetic.

Extended Product Warranty

LG has extended the product warranty of the LG NeON® R to 25 years which is top level of the industry.

Enhanced Performance Warranty

LG NeON® R has an enhanced performance warranty. After 25 years, LG NeON® R is guaranteed to perform at minimum 90.8% of initial performance.

More generation per square meter

The LG NeON® R has been designed to significantly enhance its output, making it efficient even in limited space.

About LG Electronics

LG Electronics is a global big player, committed to expanding its operations with the solar market. The company first embarked on a solar energy source research program in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry and materials industries. In 2010, LG Solar successfully released its first MonoX® series to the market, which is now available in 32 countries. The NeON® (previous. MonoX® NeON), NeON®2, NeON®2 BiFacial won the "Intersolar AWARD" in 2013, 2015 and 2016, which demonstrates LG Solar's lead, innovation and commitment to the industry.

LG NeON®R

LG380Q1C-V5 I LG375Q1C-V5 I LG370Q1C-V5 I LG365Q1C-V5

General Data

Cell Properties(Material / Type)	Monocrystalline / N-type
Cell Maker	LG
Cell Configuration	60 Cells (6 x 10)
Module Dimensions(L x W x H)	1,700mm x 1,016mm x 40mm
Weight	17.5 kg
Glass(Thickness / Material)	2.8mm / Tempered Glass with AR Coating
Backsheet(Color)	White
Frame(Material)	Anodized Aluminium
Junction Box(Protection Degree)	IP68 with 3 Bypass Diodes
Cables(Length)	1,000mm x 2EA
Connector(Type / Maker)	MC4 / MC

Certifications and Warranty

Certifications	IEC 61215-1/-1-1/2:2016, IEC 61730-1/2:2016
	UL 1703
	ISO 9001, ISO 14001, ISO 50001
	OHSAS 18001
Salt Mist Corrosion Test	IEC 61701:2012 Severity 6
Ammonia Corrosion Test	IEC 62716:2013
Module Fire Performance	Type 1 (UL 1703)
Fire Rating	Class C (UL 790, ULC/ORD C 1703)
Product Warranty	25 Years
Output Warranty of Pmax	Linear Warranty*

* 1) First year : 98%, 2)After 1st year : 0.3% annual degradation 3) 90.8% for 25years
** LG380Q1C-V5 model has UL 1703 certification only

Temperature Characteristics

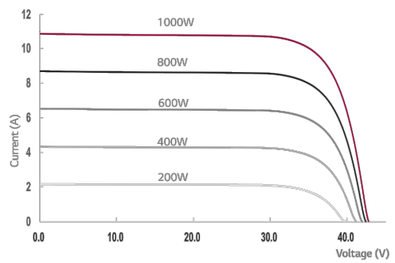
NMOT*	[℃]	44 ± 3
Pmax	[%/℃]	-0.30
Voc	[%/℃]	-0.24
Isc	[%/℃]	0.037

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

Electrical Properties (NMOT)

Model		LG380Q1C-V5	LG375Q1C-V5	LG370Q1C-V5	LG365Q1C-V5
Maximum Power (Pmax)	[W]	286	282	279	275
MPP Voltage (Vmpp)	[V]	37.3	37.1	36.9	36.6
MPP Current (Impp)	[A]	7.67	7.61	7.55	7.51
Open Circuit Voltage (Voc)	[V]	40.3	40.3	40.3	40.2
Short Circuit Current (Isc)	[A]	8.73	8.72	8.71	8.70

I-V Curves



Electrical Properties (STC*)

Model		LG380Q1C-V5	LG375Q1C-V5	LG370Q1C-V5	LG365Q1C-V5
Maximum Power (Pmax)	[W]	380	375	370	365
MPP Voltage (Vmpp)	[V]	37.4	37.2	37.0	36.7
MPP Current (Impp)	[A]	10.17	10.09	10.01	9.95
Open Circuit Voltage (Voc, ±5%)	[V]	42.9	42.8	42.8	42.8
Short Circuit Current (Isc, ±5%)	[A]	10.84	10.83	10.82	10.80
Module Efficiency	[%]	22.0	21.7	21.4	21.1
Power Tolerance	[%]	0 ~ +3			

* STC (Standard Test Condition): Irradiance 1000 W/m², Cell Temperature 25 ℃, AM 1.5,
** Measure Tolerance : ± 3%

Operating Conditions

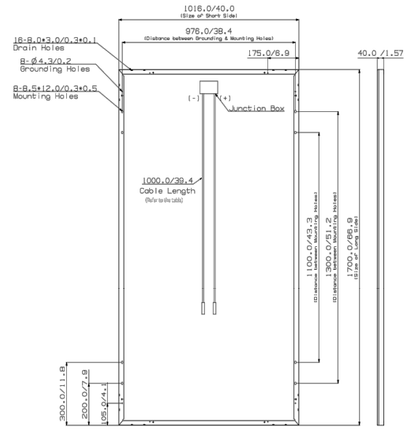
Operating Temperature	[℃]	-40 ~ +90
Maximum System Voltage	[V]	1,000
Maximum Series Fuse Rating	[A]	20
Mechanical Test Load(Front)	[Pa / psf]	5,400 / 113
Mechanical Test Load(Rear)	[Pa / psf]	4,000 / 83.5

※ Mechanical Test Load 5,400Pa / 4,000Pa based on IEC 61215-2 : 2016
(Test Load = Design Load x Safety Factor(1.5))

Packaging Configuration

Number of Modules Per Pallet	[EA]	25
Number of Modules Per 40ft HQ Container	[EA]	650
Packaging Box Dimensions (L x W x H)	[mm]	1,750 x 1,120 x 1,221
Packaging Box Gross Weight	[kg]	473

Dimensions (mm / inch)



LG Electronics Inc.
Solar Business Division
LG Twin Towers, 128 Yeoui-daero, Yeongdeungpo-gu, Seoul
07336, Korea
www.lg-solar.com

Tri-State Solar Services
COMPLETE SOLAR ROOFING SERVICES

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MODULE SPEC SHEET

DESIGNER/CHECKED BY:
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	SS-1

SPEC SHEET

Data Sheet
Enphase Microinverters
Region: AMERICAS

Enphase IQ 7 and IQ 7+ Microinverters

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

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

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

Easy to Install

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

Productive and Reliable

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

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

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

UL CERTIFIED SAFETY US-CA E341165

To learn more about Enphase offerings, visit **enphase.com**

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Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US		IQ7PLUS-72-2-US	
Commonly used module pairings[1]	235 W - 350 W +		235 W - 440 W +	
Module compatibility	60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage	48 V		60 V	
Peak power tracking voltage	27 V - 37 V		27 V - 45 V	
Operating range	16 V - 48 V		16 V - 60 V	
Min/Max start voltage	22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module Isc)	15 A		15 A	
Overvoltage class DC port	II		II	
DC port backfeed current	0 A		0 A	
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			

OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	240 VA		290 VA	
Nominal (L-L) voltage/range[2]	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit[3]	16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.85 leading ... 0.85 lagging		0.85 leading ... 0.85 lagging	
EFFICIENCY	**@240 V**	**@208 V**	**@240 V**	**@208 V**
Peak efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %

MECHANICAL DATA	
Ambient temperature range	-40°C to +65°C
Relative humidity range	4% to 100% (condensing)
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - No fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environmental category / UV exposure rating	NEMA Type 6 / outdoor

FEATURES	
Communication	Power Line Communication (PLC)
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.
Compliance	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 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

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

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

2019-3-26

Tri-State Solar Services
COMPLETE SOLAR ROOFING SERVICES
BBB ACCREDITED BUSINESS

LICENSE NUMBER& CLASS:HOME IMPROVEMENT/ H-12588

CUSTOMER INFORMATION

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41.110690, -73.926112
APN : 392-00-160-922

AHJ:NY - VILLAGE OF UPPER NYACK

UTILITY:O&R

PRN NUMBER: TSS-008477

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INVERTER SPEC SHEET

DESIGNER/CHECKED BY:
PM/HK

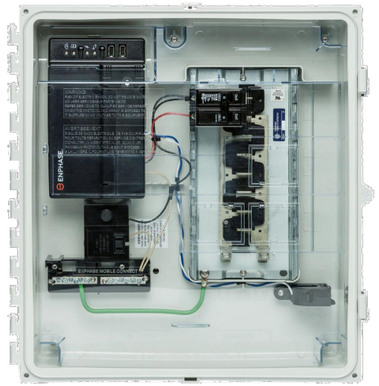
SCALE:AS NOTED	REV:A
DATE:3/9/21	SS-2

Data Sheet
Enphase Networking

Enphase IQ Combiner+

(X-IQ-AM1-240-2)

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



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Provides production metering and optional consumption monitoring
- Supports installation of the Enphase Q Aggregator™

Simple

- Eaton BR series panelboard interior
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

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

LISTED

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

Enphase IQ Combiner+

MODEL NUMBER	
IQ Combiner+ X-IQ-AM1-240-2	IQ Combiner+ with Enphase IQ Envoy™ for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES (order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G / 12-year data plan) CELLMODEM-01 (3G / 5-year data plan) CELLMODEM-M1 (4G LTE CAT-M1 / 5-year data plan)	Plug and play industrial grade cellular modem with data plan 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.)
Consumption Monitoring CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering* (+/- 2.5%).
Circuit Breakers BRK-15A-2-240 BRK-20A-2-240	 Breaker, 2 pole, 15A, Eaton BR215 Breaker, 2 pole, 20A, Eaton BR220
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	240 VAC, 60 HZ
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80 A (any combination)
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.3 x 46.5 x 16.0 cm (19.4" x 18.3" x 6.3")
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° 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: 3 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.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	802.3, Cat5E (or Cat 6) UTP Ethernet cable - not included
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) (not included)
COMPLIANCE	
Compliance, Combiner	UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 916 CAN/CSA C22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit **enphase.com**

2018-05-02

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Tri-State Solar Services
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COMBINER BOX SPEC SHEET

DESIGNER/CHECKED BY:
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	SS-3

Tech Brief

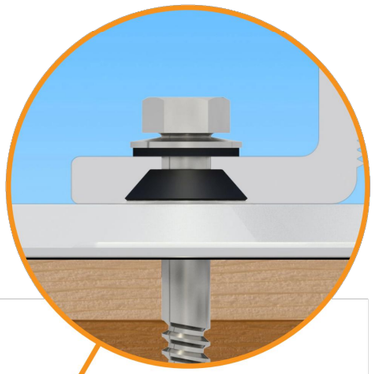
IRONRIDGE

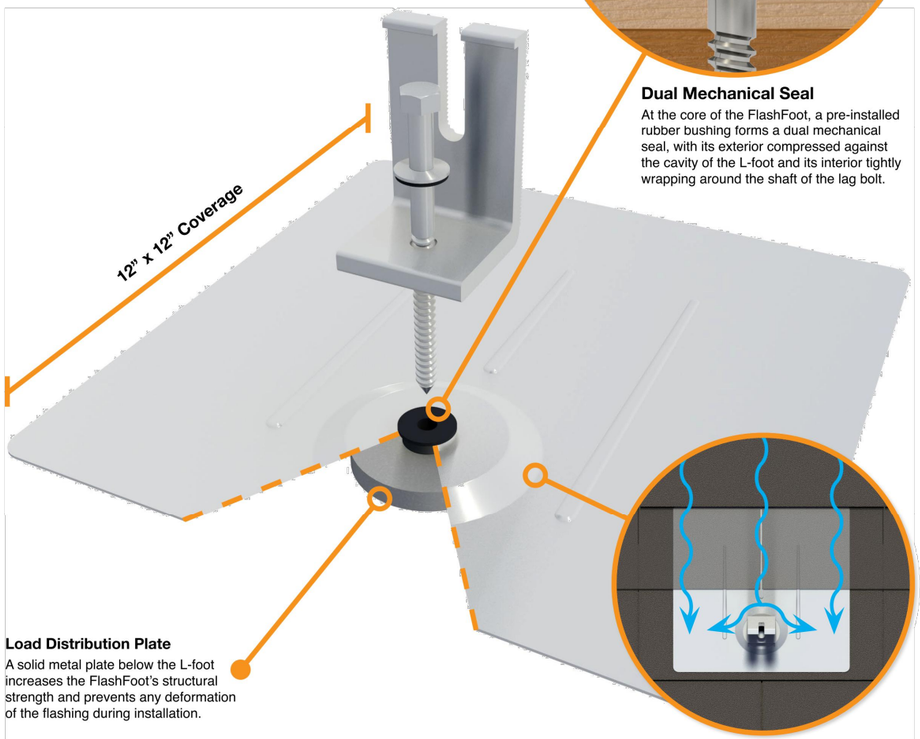
FlashFoot™

Rapid & Secure Solar Attachments

IronRidge FlashFoot™ is an all-in-one solar mounting product for composition shingle roofs that eliminates the need for separate standoffs, flashings, and L-feet.

FlashFoot incorporates a number of structural and waterproofing features to securely attach IronRidge Rails to roof structures, while also protecting against water intrusion and weather damage.





Dual Mechanical Seal

At the core of the FlashFoot, a pre-installed rubber bushing forms a dual mechanical seal, with its exterior compressed against the cavity of the L-foot and its interior tightly wrapping around the shaft of the lag bolt.

Load Distribution Plate

A solid metal plate below the L-foot increases the FlashFoot's structural strength and prevents any deformation of the flashing during installation.

Certified compliant with IBC and IRC.

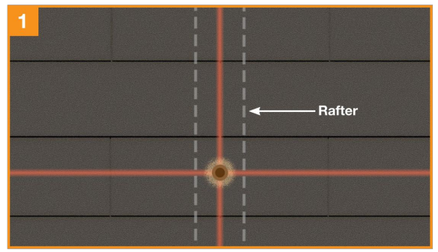
Water Shedding Design

A wide flashing layer combined with an elevated sealing platform maximizes the FlashFoot's water shedding ability.

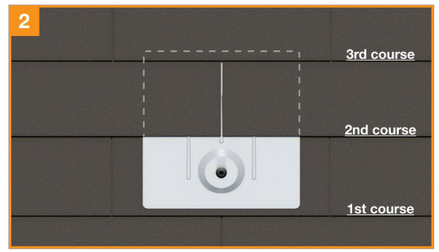
Tech Brief

Installation Overview

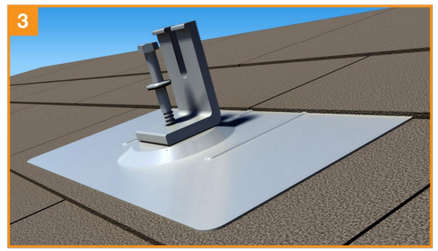
Tools Required: tape measure, chalk line, stud finder, roofing bar, caulking gun with an approved sealant, drill with 1/4" bit and 1/2" socket.



Locate rafters and snap vertical and horizontal lines to mark locations of flashings. Drill 1/4" pilot holes, then backfill with an approved sealant.



Slide flashing, between 1st and 2nd course, so the top is at least 3/4" above the edge of the 3rd course and the bottom is above the edge of the 1st course.



Line up pilot hole with flashing hole and insert lag bolt through bonded washer, L-Foot, and flashing. Tighten lag bolt until fully seated.

The FlashFoot is now installed and ready for IronRidge Rails. With provided L-foot fasteners pre-loaded into rails, drop rails into open L-foot slots.

Testing & Certification

FlashFoot is certified for compliance with the International Building Codes (IBC) & International Residential Codes (IRC) by IAPMO-ES. Mechanical testing conformed to the standard for Testing and Analysis of Joist Hangers and Miscellaneous Connectors (EC002-2011), and rain testing conformed to the Underwriters Laboratory Standard for Gas Vents (UL 441-96 Section 25).

Lag pull-out (withdrawal) capacities (lbs) in typical roof lumber (ASD)	Specific Gravity	5/16" Shaft, 3" Thread Depth
Douglas Fir, Larch	.50	798
Douglas Fir, South	.46	705
Engelmann Spruce, Lodgepole Pine (MSR 1650 f & higher)	.46	705
Hem, Fir	.43	636
Hem, Fir (North)	.46	705
Southern Pine	.55	921
Spruce, Pine, Fir	.42	615
Spruce, Pine, Fir (E of 2 million psi and higher grades of MSR and MEL)	.50	798

Sources: American Wood Council, NDS 2005, Table 11.2A, 11.3.2A; Notes: i) Thread must be embedded in a rafter or other structural roof member. ii) See IBC for required edge distances.

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MOUNT SPEC SHEET

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PM/HK

SCALE:AS NOTED	REV:A
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SPEC SHEET

Tech Brief

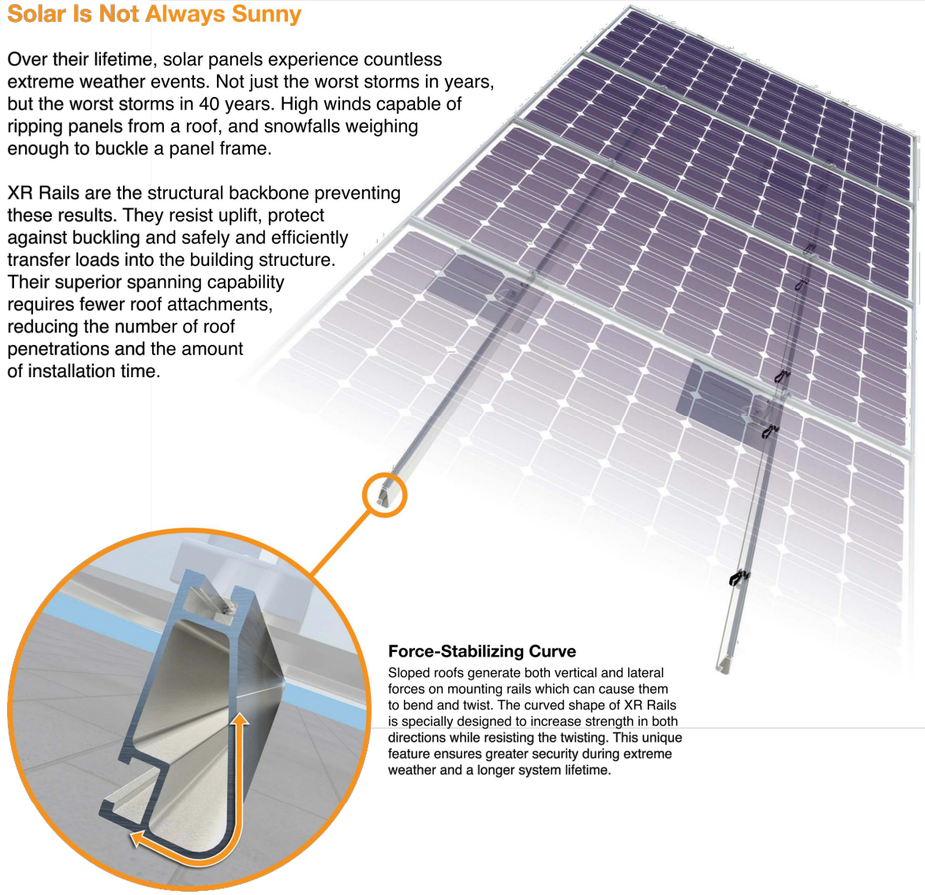
IRONRIDGE

XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.

XR10

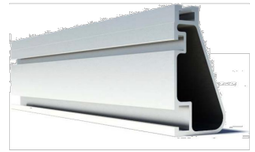
XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

Tri-State Solar Services
COMPLETE SOLAR ROOFING SERVICES

LICENSE NUMBER& CLASS:HOME IMPROVEMENT/ H-12588

CUSTOMER INFORMATION

NAME: RODNEY & LAURA CARPENTIER

ADDRESS:508 W POND RD, NYACK, NY 10960

41.110690, -73.926112
APN : 392-00-160-922

AHJ:NY - VILLAGE OF UPPER NYACK

UTILITY:O&R

PRN NUMBER: TSS-008477

ILLUMINE i
Because quality matters

RAIL SPEC SHEET

DESIGNER/CHECKED BY:
PM/HK

SCALE:AS NOTED	REV:A
DATE:3/9/21	SS-5

W CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

Scott E. Wyssling, PE, PP, CME

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Alpine, UT 84004
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March 11, 2020
revised March 10, 2021

Illumine Industries
39111 Paseo Padre Parkway Suite 313
Fremont, CA 94538

Re: Engineering Services
Carpentier Residence
508 West Pond Road, Nyack NY
8.250 kW System

To Whom It May Concern:

Pursuant to your request, we have reviewed the following information regarding solar panel installation on the roof of the above referenced home:

1. Site Visit/Verification Form prepared by a Illumine Industries representative identifying specific site information including size and spacing of rafters for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information was prepared by Illumine Industries and will be utilized for approval and construction of the proposed system.
3. Photographs of the interior and exterior of the roof system identifying existing structural members and their conditions.

Based on the above information we have evaluated the structural capacity of the existing roof system to support the additional loads imposed by the solar panels and have the following comments related to our review and evaluation:

Description of Residence:

The existing residence is typical wood framing construction with the roof system consisting of 2 x 8 dimensional lumber at 16" on center. The attic space is unfinished and photos indicate that there was free access to visually inspect the size and condition of the roof rafters. All wood material utilized for the roof system is assumed to be Doug-Fir #2 or better with standard construction components. The existing roofing material consists of composite asphalt shingles. Photos of the dwelling also indicate that there is a permanent foundation.

A. Loading Criteria Used

- 115 MPH wind loading based on ASCE 7-10 Exposure Category "C" at a slope of 22 degrees
- 7 PSF = Dead Load roofing/framing Live Load = 30 PSF Snow Load = 20 PSF
- 3 PSF = Dead Load solar panels/mounting hardware

Total Dead Load =10 PSF

The above values are within acceptable limits of recognized industry standards for similar structures in accordance with the 2015 (IRC), 2017 NYS Supplement. *Analysis performed of the existing roof structure utilizing the above loading criteria indicates that the existing rafters will support the additional panel loading without damage, if installed correctly.*

B. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent "*Ironridge Installation Manual*", which can be found on the Ironridge website (*http://ironridge.com/*). 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.
2. The minimum allowable design wind uplift pressure per ASCE 7-10 is 49 PSF. UL 1987 Uplift Testing performed on the Deco-Tech fastener provides worst case uplift pressure of 60 PSF without failure. Based on the variable factors for the existing roof framing/decking and installation tolerances, with a minimum size #14 screw with 3 per attachment point for panel anchor mounts shall be adequate with a sufficient factor of safety.
3. Documentation regarding independent testing in conformance to *UL 1987: Standard for Uplift Tests for Roof Covering Systems* can be provided upon request.

Based on the above evaluation, it is the opinion of this office that with appropriate panel anchors being utilized the roof system will adequately support the additional loading imposed by the solar panels. This evaluation is in conformance with the 2015 International Residential Code, 2017 NYS Supplement, current industry standards and practice, and based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

Scott E. Wyssling, PE
NY PE License No. 092303