PHOTOVOLTAIC GROUND MOUNT SYSTEM

40 MODULES-GROUND MOUNTED - 16.400 kW DC, 11.600 kW AC, 25 DUGAN LANE, HOPEWELL JUNCTION, NY 12533

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	16.400 kW DC 11.600 kW AC
MODULE TYPE & AMOUNT:	(40) SEG SOLAR SEG-410-BMD-HV [410W]
MODULE DIMENSIONS:	(L/W/H) 67.80"/44.65"/1.18"
INVERTER:	(40) ENPHASE IQ8PLUS-72-2-US [240V]
INTERCONNECTION METHOD:	LINE SIDE TAP
UTILITY METER#:	73 261 088
AHJ#.	WAPPINGER TOWN

SCOPE OF WORK:

INSTALLATION OF UTILITY INTERACTIVE PHOTOVOLTAIC SOLAR SYSTEM AND ANY NECESSARY ADDITIONAL WORK NEEDED FOR INSTALLATION.

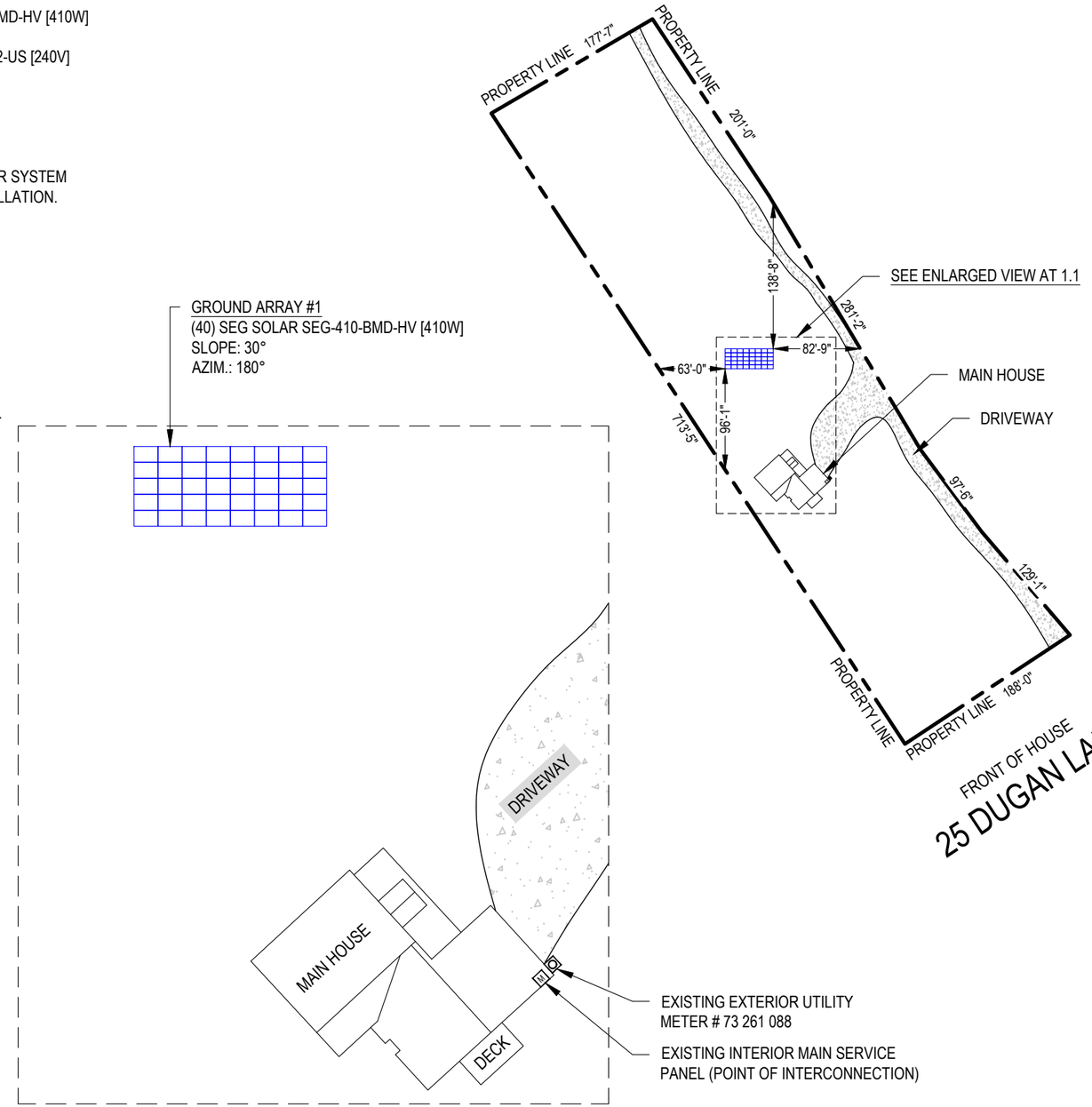
GOVERNING CODES

ADOPTED CONSTRUCTION CODES

- 2020 BUILDING CODE OF NEW YORK STATE·
- 2020 PLUMBING CODE OF NEW YORK STATE
- 2020 MECHANICAL CODE OF NEW YORK STATE·
- 2020 FUEL GAS CODE OF NEW YORK STATE·
- 2020 RESIDENTIAL CODE OF NEW YORK STATE·
- 2020 FIRE CODE OF NEW YORK STATE·
- 2020 ENERGY CONSERVATION CODE OF NEW YORK STATE·
- 2020 PROPERTY MAINTENANCE CODE OF NEW YORK STATE·
- 2017 NATIONAL ELECTRICAL CODE

GENERAL NOTES

1. A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM.
3. THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
4. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SHALL SERVE TO PROTECT THE BUILDING OR STRUCTURE.
5. MODULE CERTIFICATIONS WILL INCLUDE UL1703, IEC61646, IEC61730.
6. IF APPLICABLE, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE MARKED GROUNDING LUG HOLES PER THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
7. AS INDICATED BY DESIGN, OTHER NRTL LISTED MODULE GROUNDING DEVICES MAY BE USED IN PLACE OF STANDARD GROUNDING LUGS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ.
8. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
9. ALL INVERTERS, MOTOR GENERATORS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AC PHOTOVOLTAIC MODULES, DC COMBINERS, DC-TO-DC CONVERTERS,SOURCE CIRCUIT COMBINERS, AND CHARGE CONTROLLERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER NEC 690.4(B).



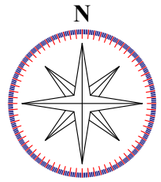
1.1 ENLARGED VIEW (PV 0.0)

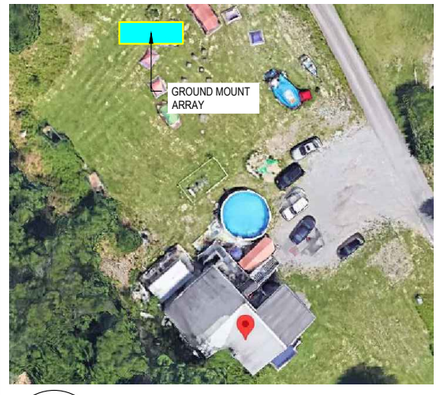
SCALE: 1/32"=1"-0"

1 PLOT PLAN (PV 0.0)

SCALE: 1/128" = 1'-0"

SHEET INDEX:





2 SATELLITE VIEW (PV 0.0)

SCALE: NTS

3 VICINITY MAP (PV 0.0)

SCALE: NTS

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Description	Date	Rev
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Signature with Seal

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Sheet Name: COVER SHEET

Sheet Size: ANSI B 11" X 17"

Sheet Number: PV 0.0

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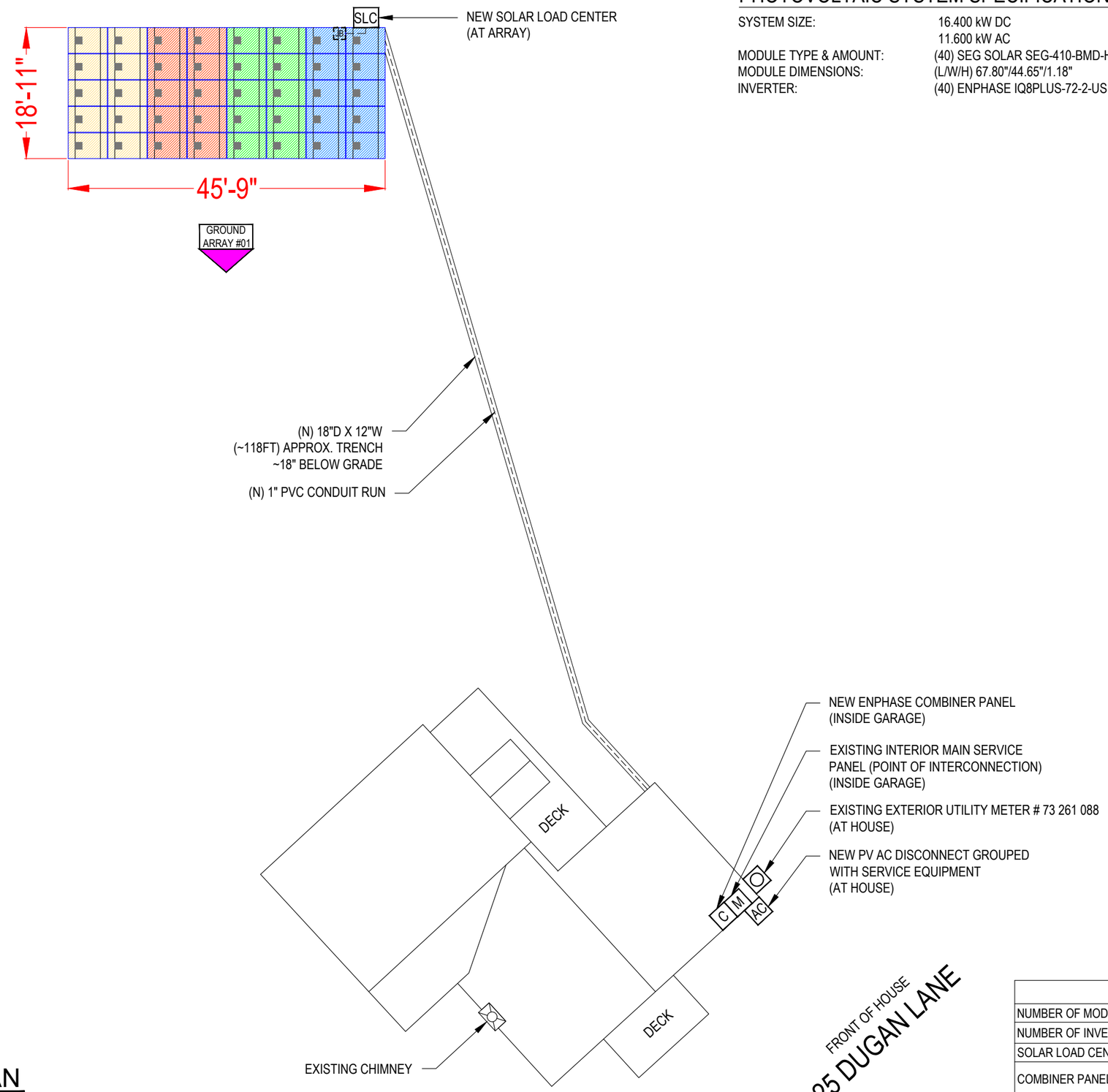

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	16.400 kW DC 11.600 kW AC
MODULE TYPE & AMOUNT:	(40) SEG SOLAR SEG-410-BMD-HV [410W]
MODULE DIMENSIONS:	(L/W/H) 67.80"/44.65"/1.18"
INVERTER:	(40) ENPHASE IQ8PLUS-72-2-US [240V]

SYSTEM LEGEND

- ◯ EXISTING EXTERIOR UTILITY METER # 73 261 088 (AT HOUSE)
- M EXISTING INTERIOR MAIN SERVICE PANEL (POINT OF INTERCONNECTION) (INSIDE GARAGE)
- AC NEW PV AC DISCONNECT GROUPED WITH SERVICE EQUIPMENT (AT HOUSE)
- C NEW ENPHASE COMBINER PANEL (INSIDE GARAGE)
- SLC NEW SOLAR LOAD CENTER (AT ARRAY)
- JB NEW JUNCTION BOX
- 40 NEW SEG SOLAR SEG-410-BMD-HV [410W] MODULES WITH 40 - ENPHASE IQ8PLUS-72-2-US [240V] INVERTERS, MOUNTED ON THE BACK OF EACH MODULES.
- □○ = ROOF OBSTRUCTION
- —— = RACKING SYSTEM
- - - - = CONDUIT RUN
- —— = TRENCH

ARRAY DETAIL

GROUND ARRAY #01 — MODULE - 40, SLOPE - 30°, AZIMUTH - 180°

CIRCUIT(S)

- CIRCUIT #1 - 10 MODULES
- CIRCUIT #2 - 10 MODULES
- CIRCUIT #3 - 10 MODULES
- CIRCUIT #4 - 10 MODULES

N

BILL OF MATERIALS

NUMBER OF MODULES	40	SEG SOLAR SEG-410-BMD-HV [410W]
NUMBER OF INVERTER	40	ENPHASE IQ8PLUS-72-2-US [240V]
SOLAR LOAD CENTER	1	125A SOLAR LOAD CENTER,240V
COMBINER PANEL	1	125A ENPHASE IQ COMBINER 5/5C X-IQ-AM1-240-5, 240V
AC DISCONNECT	1	100A FUSIBLE AC DISCONNECT, WITH 70A FUSES, 240V

1 SITE PLAN
PV 1.0
SCALE: 1/16" = 1'-0"

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SITE PLAN

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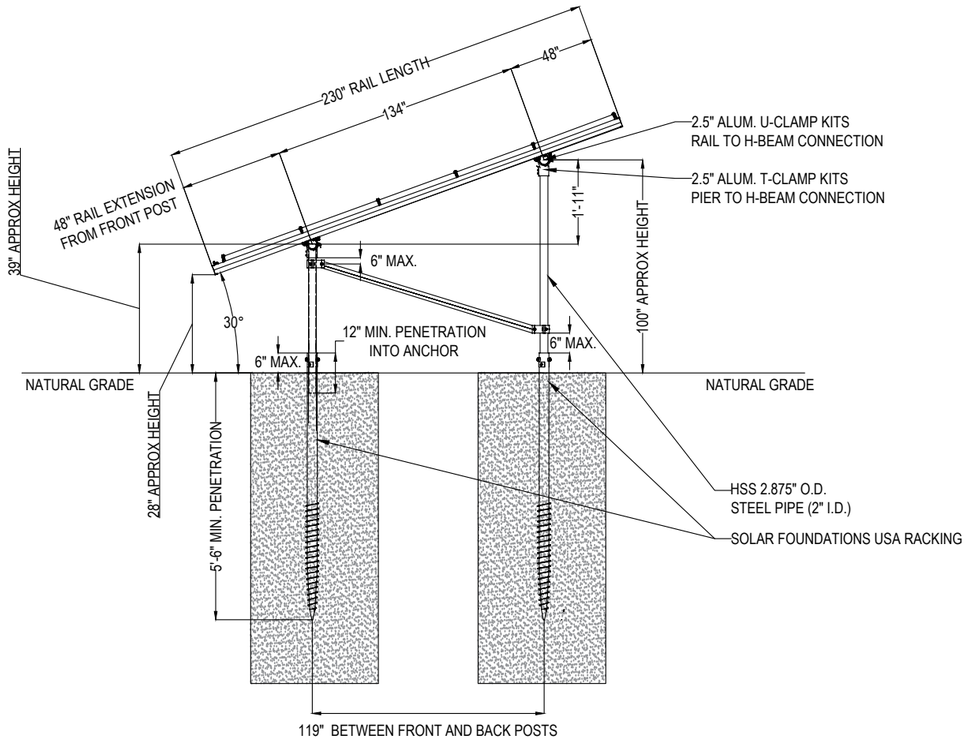
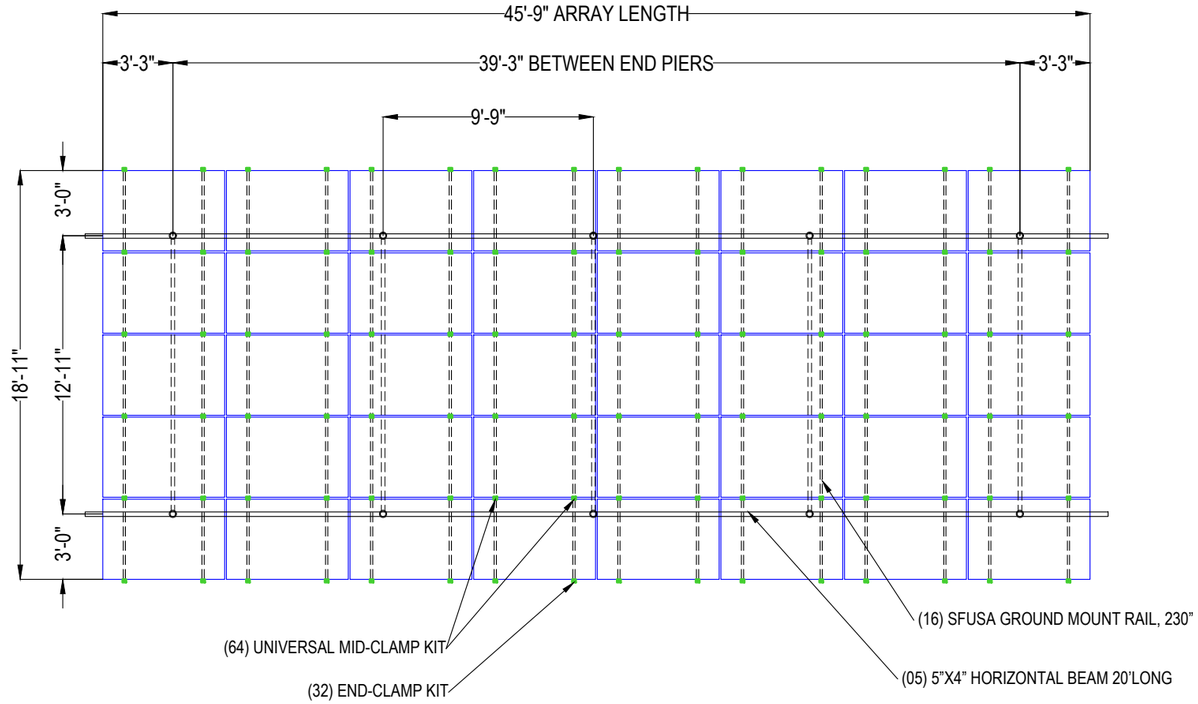


1 ARRAY LAYOUT (TYP.)

S 1.1

SCALE: NTS



2 ELEVATION DETAIL

S 1.1

SCALE: NTS

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MOUNT DETAIL

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SOLAR LOAD CENTER TO AC COMBINER (118ft TRENCH)

$\frac{2 \times 12.9 = 25.8 \times 118' = 3{,}044 \times 48.4A}{41740}$ = 3.529 volts (3)

% VOLTAGE DROP: $\frac{3.529 volts}{240 volts}$ = 0.0147 x 100 = 1.47%

Voltage @ Load: 240 volts - 3.529 volts = 236.471 volts

Rooftop conductor ampacities designed in compliance with art. 690.8, Tables 310.15(B)(2)(a), 310.15(B)(3)(a), 310.15(B)(3)(c), 310.15(B)(16), Chapter 9 Table 4, 5, & 9. Location specific temperature obtained from ASHRAE 2017 data tables

RECORD LOW TEMP	-22°C
AMBIENT TEMP (HIGH TEMP 2%)	33°C
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	55°C
CONDUCTOR TEMPERATURE RATE	90°C

VISIBLE, LOCKABLE, LABELED DISCONNECT WITHIN 10' OF UTILITY METER

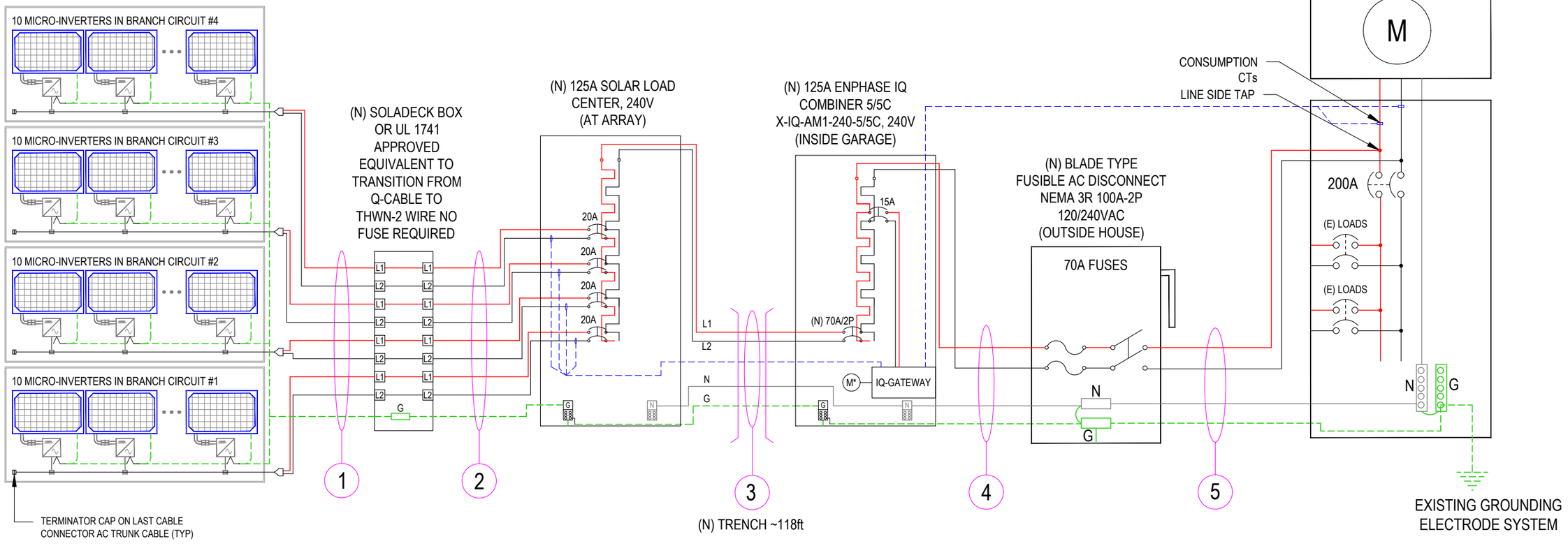
THIS PANEL IS FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)	
AC OUTPUT CURRENT	48.40A
NOMINAL AC VOLTAGE	240V

PHOTOVOLTAIC SYSTEM	
DC SYSTEM SIZE (WATTS)	16400W
AC SYSTEM SIZE (WATTS)	11600W
TOTAL NUMBER OF MODULES	40
NOMINAL AC VOLTAGE	240V

SYSTEM SIZE: 16.40 kW DC
11.60 kW AC
MODULE: (40) SEG SOLAR SEG-410-BMD-HV [410W]
INVERTER: (40) ENPHASE IQ8PLUS-72-2-US [240V]

POINT OF INTERCONNECT, LINE SIDE TAP
EXISTING 240V/200A BUS BAR RATING, MAIN SERVICE PANEL, SINGLE PHASE, WITH A 200A MAIN BREAKER
UTILITY COMPANY - CENTRAL HUDSON G&E
UTILITY METER# 73 261 088
SERVICE: UNDERGROUND

(40) (ENPHASE IQ8PLUS-72-2-US [240V])
MICROINVERTERS 240VAC, 1.21A MAX
CEC WEIGHTED EFFICIENCY 97.0%
NEMA 4R, UL LISTED, INTERNAL GFDI



WIRE TAG #	WIRE FROM - -	CONDUIT	WIRE QTY	WIRE GAUGE:	WIRE TYPE ENPHASE TRUNK CABLE INCLUDES #12 GROUND	TEMP RATING:	WIRE AMP	TEMP DE-RATE:	CONDUIT FILL:	WIRE OCP:	TERMINAL 75°C RATING:	INVERTER QTY:	NOC:	NEC:	STRING AMPS	GRND SIZE	GRND WIRE TYPE
1	ARRAY TO JUNCTION BOX	IQ CABLE	8	#12	TRUNK CABLE	90°	30A x	0.96 x	N/A	= 28.80A	25A	10	x 1.21A x	1.25	= 15.13A	#6	SBC
2	JUNCTION BOX TO LOAD CENTER	1" EMT	8	#10	THWN-2	75°	35A x	0.94 x	0.70	= 23.03A	35A	10	x 1.21A x	1.25	= 15.13A	#8	THWN-2
3	LOAD CENTER TO COMBINER PANEL (TRENCH ~118ft)	1" PVC	3	#4	THWN-2	75°	85A x	0.94 x	1.00	= 79.90A	85A	40	x 1.21A x	1.25	= 60.50A	#8	THWN-2
4	COMBINER PANEL TO ACD	1" EMT	3	#4	THWN-2	75°	85A x	0.94 x	1.00	= 79.90A	85A	40	x 1.21A x	1.25	= 60.50A	#8	THWN-2
5	ACD TO MSP	1" EMT	3	#4	THWN-2	75°	85A x	0.94 x	1.00	= 79.90A	85A	40	x 1.21A x	1.25	= 60.50A	#8	THWN-2

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Sheet Name
3-LINE DIAGRAM

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PV MODULE RATING @ STC	
MANUFACTURER	SEG SOLAR SEG-410-BMD-HV [410W]
MAX. POWER-POINT CURRENT (IMP)	13.21 AMPS
MAX. POWER-POINT VOLTAGE (VMP)	31.05 VOLTS
OPEN-CIRCUIT VOLTAGE (VOC)	37.32 VOLTS
SHORT-CIRCUIT CURRENT (ISC)	13.80 AMPS
NOM. MAX. POWER AT STC (PMAX)	410 WATT
MAX. SYSTEM VOLTAGE	1500V
VOC TEMPERATURE COEFFICIENT	-0.27° %/°C

MICRO-INVERTER SPECIFICATIONS	
MANUFACTURER	ENPHASE IQ8PLUS-72-2-US
MAX. INPUT DC VOLTAGE	60 VOLTS
MAX. CONT. OUTPUT POWER	290 WATTS
NOMINAL AC VOLTAGE	240 VOLTS
MAX. AC CURRENT	1.21 AMPS
MAX. OCPD RATING	20 AMPS
MAX. PANELS/CIRCUIT	13

EQUIPMENT LOCATIONS:

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

STRUCTURAL NOTES:

1. RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUSTALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.
2. JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
3. ROOFTOP PENETRATIONS FOR PV RACEWAY WILLBE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
4. ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER. 2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

WIRING & CONDUIT NOTES:

1. ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS AREBASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
2. CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
3. VOLTAGE DROP LIMITED TO 1.5%.
4. DC WIRING LIMITED TO MODULE FOOTPRINT. MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.
5. AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3- BLUE, YELLOW, ORANGE**, OR OTHER CONVENTION NEUTRAL- WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

GROUNDING NOTES:

1. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVISES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
2. PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.
3. METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).
4. EQUIPMENT GROUNDING CONDUCTORS SHALLBE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTORERS' INSTRUCTIONS.
5. EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
6. THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OFA MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
7. GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]
8. THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.
9. GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:

1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHENTHE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARECONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
2. DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D).
4. ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.
5. MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).
6. IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

INTERCONNECTION NOTES:

1. LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)]
2. THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(D)(2)(3)].
3. THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].
4. AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).
5. FEEDER TAP INTERCONECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1)
6. SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42 2.7.8BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

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⚠ WARNING

ELECTRIC SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 1
FOR PV SYSTEM DISCONNECTING MEANS WHERE THE LINE AND LOAD TERMINALS MAY BE ENERGIZED IN THE OPEN POSITION.
[2017 NEC 690.13(B)]

PHOTOVOLTAIC SYSTEM
⚠ AC DISCONNECT ⚠

RATED AC OUTPUT CURRENT 48.40 A
NOMINAL OPERATING AC VOLTAGE 240 V

LABEL 2
SHALL BE MARKED AT AN ACCESSIBLE LOCATION AT THE DISCONNECTING MEANS AS A POWER SOURCE AND WITH THE RATED AC OUTPUT CURRENT AND THE NOMINAL OPERATING AC VOLTAGE.
[2017 NEC 690.54]

⚠ WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL 3
IF INTERCONNECTING LOAD SIDE, INSTALL THIS LABEL ANYWHERE THAT IS POWERED BY BOTH THE UTILITY AND THE SOLAR PV SYSTEM, IE. MAIN SERVICE PANEL AND SUBPANELS.
[2017 NEC 705.12(B)(3)]

⚠ WARNING

POWER SOURCE OUTPUT CONNECTION

DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL 4
APPLY TO THE DISTRIBUTION EQUIPMENT ADJACENT TO THE BACK-FED BREAKER FROM THE POWER SOURCE.
[2017 NEC 705.12(B)(2)(3)(b)]

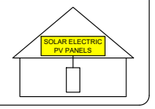
⚠ WARNING

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

LABEL 5
APPLY TO THE PV COMBINER BOX
[2017 NEC 705.12(B)(2)(3)(c)]

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



LABEL 6
BUILDINGS WITH PV SYSTEMS SHALL HAVE A PERMANENT LABEL LOCATED AT EACH SERVICE EQUIPMENT LOCATION TO WHICH THE PV SYSTEMS ARE CONNECTED OR AT AN APPROVED READILY VISIBLE LOCATION AND SHALL INDICATE THE LOCATION OF RAPID SHUTDOWN INITIATION DEVICES.
[2017 NEC 690.56(C)(1)(a)]

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL 7
SIGN LOCATED AT RAPID SHUT DOWN DISCONNECT SWITCH
[2017 NEC 690.56(C)(3)]

⚠ WARNING

MAIN DISTRIBUTION UTILITY DISCONNECT(S)

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM A ROOF MOUNTED SOLAR ARRAY WITH A RAPID SHUTDOWN DISCONNECTING MEANS GROUPED AND LABELED WITHIN LINE OF SITE AND 10 FT OF THIS LOCATION

LABEL 8
PERMANENT PLAQUE OR DIRECTORY DENOTING THE LOCATION OF ALL ELECTRIC POWER SOURCE DISCONNECTING MEANS ON OR IN THE PREMISES SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT THE LOCATION(S) OF THE SYSTEM DISCONNECT(S) FOR ALL ELECTRIC POWER PRODUCTION SOURCES CAPABLE OF BEING INTERCONNECTED.
[2017 NEC 705.10]

⚠ WARNING

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM MAIN DISTRIBUTION UTILITY DISCONNECT LOCATED

LABEL 9
PERMANENT PLAQUE OR DIRECTORY DENOTING THE LOCATION OF ALL ELECTRIC POWER SOURCE DISCONNECTING MEANS ON OR IN THE PREMISES SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT THE LOCATION(S) OF THE SYSTEM DISCONNECT(S) FOR ALL ELECTRIC POWER PRODUCTION SOURCES CAPABLE OF BEING INTERCONNECTED.
[2017 NEC 705.10]

⚠ WARNING

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM A ROOF MOUNTED SOLAR ARRAY. SOLAR ARRAY RAPID SHUTDOWN DISCONNECT IS LOCATED OUTSIDE NEXT TO THE UTILITY METER.

LABEL 10
PERMANENT PLAQUE OR DIRECTORY TO BE LOCATED AT MAIN SERVICE EQUIPMENT DENOTING THE LOCATION OF THE RAPID SHUTDOWN SYSTEM DISCONNECTING MEANS IF SOLAR ARRAY RAPID SHUTDOWN DISCONNECTING SWITCH IS NOT GROUPED AND WITHIN LINE OF SITE OF MAIN SERVICE DISCONNECTING MEANS.
[2017 NEC 705.10 AND 690.56(C)(1)(a)]

⚠ WARNING

PHOTOVOLTAIC SYSTEM COMBINER PANEL

DO NOT ADD LOADS

LABEL 11
PERMANENT PLAQUE OR DIRECTORY TO BE LOCATED AT AC COMBINER PANEL.
[2017 NEC 110.21(B)]

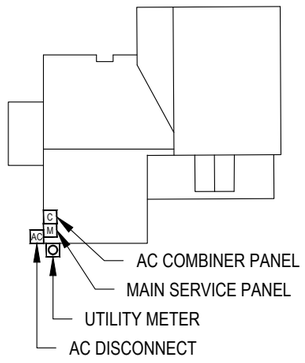
LABELING NOTES

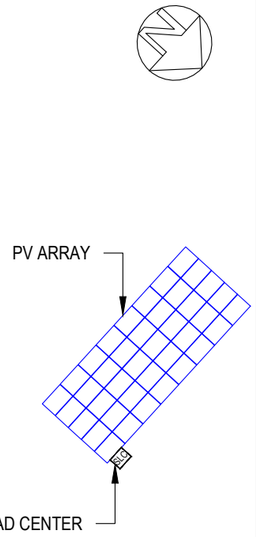
1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE 2017 & 2020 NEC CODE, OSHA STANDARD 19010.145, ANSIZ535.
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AHJ.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED AND SHALL NOT BE HANDWRITTEN [NEC 110.21]

CAUTION:

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

25 DUGAN LANE





InfinityEnergy
INFINITY ENERGY
575 CORPORATE DR. SUITE 2200,
MAHWAH, NJ 07430
PH: 1 (845) 200-3700

REVISIONS

Description	Date	Rev
INITIAL DESIGN	2/22/2024	00

Signature with Seal

Project Name & Address

DARIN JACKSON RESIDENCE
25 DUGAN LANE,
HOPEWELL JUNCTION, NY 12533
PHONE: (845) 380-5853
APN #: 13568963560102798500000

Sheet Name
WARNING LABELS

Sheet Size
ANSI B
11" X 17"

Sheet Number
E 1.3

Drawn By
PremiumCAD

SEG SOLAR

YUKON Series

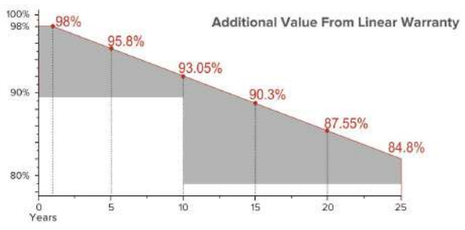
Half-Cell Monofacial Module

400-415W Module Power Output | **21.25%** Max Efficiency

Key Features

- High module conversion efficiency
- Better temperature coefficient
- Super multi busbar technology
- Low attenuation long warranty
- Superior load capacity
- Aesthetic appearance
- USA based liability insurance
- Houston, Texas based company

Warranty



25 <Years> Guarantee on product material and workmanship

25 <Years> Linear power output warranty

Product Certification

IEC61215:2016; IEC 61730:2016;	UL1703; UL61730/ETL/CEC
IEC62804	PID
IEC61701	Salt Mist
IEC62716	Ammonia Resistance
IEC60068	Dust and Sand
IEC61215	Hailstone
Fire Type (UL61730):Type1	
ISO14001:2015; ISO9001:2015; ISO45001:2018	

Intertek · PV CYCLE · CE · TÜV · FSEC · CALIFORNIA ENERGY COMMISSION

About SEG Solar

SEG Solar is a leading manufacturer of high-performance solar panels for residential, commercial, and utility applications. The company, headquartered in Houston,Texas, is committed to providing cost-effective and reliable solar solutions that help customers reduce their energy costs and carbon footprint.

Download Datasheet

SEG SOLAR

YUKON Series SEG-XXX-BMD-HV(108Cells)

Electrical Characteristics

Module Type	SEG-400-BMD-HV		SEG-405-BMD-HV		SEG-410-BMD-HV		SEG-415-BMD-HV	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power -Pmp(W)	400	301	405	304	410	308	415	311
Open Circuit Voltage -Voc(V)	37.12	34.64	37.22	34.73	37.32	34.81	37.42	34.90
Short Circuit Current -Isc(A)	13.60	10.99	13.70	11.07	13.80	11.15	13.90	11.23
Maximum Power Voltage -Vmp(V)	30.81	28.82	30.93	28.91	31.05	29.05	31.16	29.19
Maximum Power Current -Imp(A)	12.99	10.44	13.10	10.51	13.21	10.59	13.32	10.66
Module Efficiency STC-ηm(%)	20.48		20.74		21.00		21.25	
Power Tolerance(W)	(0, +3%)							
Maximum System Voltage	1500V DC							
Maximum Series Fuse Rating	25 A							

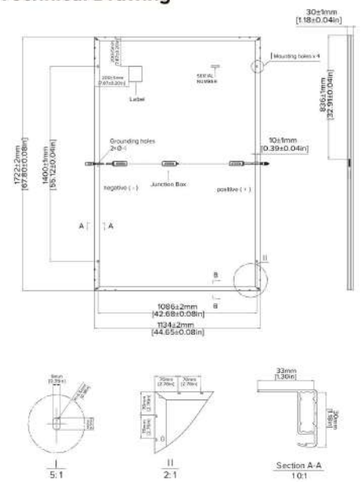
STC: Irradiance 1000 W/m² module temperature 25°C AM=1.5 NOCT: Irradiance 800W/m² ambient temperature 20°C module temperature 45°C wind speed: 1m/s Power measurement tolerance: +/-3%

Mechanical Specifications

External Dimension	1722 x 1134 x 30 mm
Weight	21.5 kg
Solar Cells	PERC Mono 182 x 91mm(108 pcs)
Front Glass	3.2 / mm AR coating tempered glass / low iron
Frame	Black anodized aluminium alloy
Junction Box	IP68 / 3 diodes
Connector Type	MC4
Cable Type / Length	12 AWG PV Wire（UL）/1200 mm
Mechanical Load(Front)	5400 Pa / 113 psf*
Mechanical Load(Rear)	3600 Pa / 75 psf*

*Refer to SEG installation Manual for details

Technical Drawing



*Refer to SEG installation Manual for details

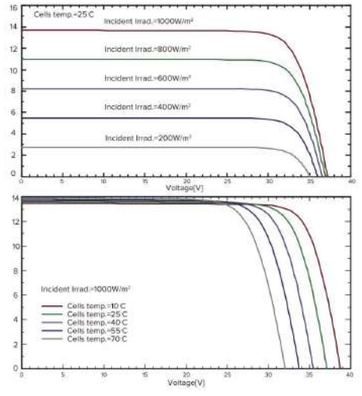
Packing Configuration

Container	20'GP	40'HQ
Pieces per Pallet	36	36
Pallets per Container	6	26
Pieces per Container	216	936

Temperature Characteristics

Pmax Temperature Coefficient	-0.35 %/°C
Voc Temperature Coefficient	-0.27 %/°C
Isc Temperature Coefficient	+0.05 %/°C
Operating Temperature	-40~+85 °C
Nominal Operating Cell Temperature (NOCT)	45±2 °C

I-V Curve



www.segsolar.com

ENPHASE.

DATA SHEET

IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has superfast 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 IQ Battery, IQ Gateway, and the Enphase App monitoring and analysis software.

Enphase 25 year limited warranty

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

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

UL CERTIFIED SAFETY

IQ8 Series Microinverters are UL listed as PV Rapid Shutdown 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) and IEEE 1547:2018 (UL 1741-SB 3rd Ed.)

Note:

IQ8 Microinverters cannot be mixed together with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, etc) in the same system.

*Only when installed with IQ System Controller 2, meets UL 1741.
**IQ8 and IQ8Plus support split-phase, 240V installations only.

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	54-cell / 108 half-cell, 60-cell / 120 half-cell, 66-cell / 132 half-cell and 72-cell / 144 half-cell
MPPT voltage range	V	27 – 37	27 – 45
Operating range	V	16 – 48	16 – 58
Min. / Max. start voltage	V	22 / 48	22 / 58
Max. input DC voltage	V	50	60
Max. continuous input DC current	A	10	12
Max. input DC short-circuit current	A	25	
Max. module I_{sc}	A	20	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
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)		**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[2]	V	240 / 211 – 264	
Max. continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	47 – 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max. units per 20 A (L-L) branch circuit[3]		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	%	97.7	
CEC weighted efficiency	%	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 (H x W x D)		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	
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, IEEE 1547:2018 (UL 1741-SB 3rd Ed.), 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 Shutdown 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) Pairing PV modules with wattage above the limit may result in additional clipping losses. See the compatibility calculator at https://link.enphase.com/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.

IQ8SP-12A-DS-0067-03-EN-US-2022-12-27

ENPHASE

DATASHEET

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

IQ Combiner 5/5C

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

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

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

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

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

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

Smart

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

Easy to install

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

Reliable

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

Enphase 5 year limited warranty
5-year limited warranty

UL LISTED

IQ Combiner 5/5C

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

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

IQC-5-5C-DSH-00007-2.0-EN-US-2023-09-27

CERTIFICATE OF COMPLIANCE

Certificate Number	20220917-E341165
Report Reference	E341165-20210317
Date	2022-09-17

Issued to: Enphase Energy Inc.
1420 N. McDowell Blvd. Petaluma, CA 94954-6515

This is to certify that representative samples of Photovoltaic Grid Support Utility Interactive Inverter with Rapid Shutdown Functionality

Models: IQ8-60, IQ8PLUS-72, IQ8M-72, IQ8A-72, IQ8H-208-72, IQ8H-240-72, may be f/b -2, -5, -E or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: See Page 2

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	20220917-E341165
Report Reference	E341165-20210317
Date	2022-09-17

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.
Standards for Safety:

UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Edition 3, Issue Date 09/28/2021. Including the requirements in UL 1741 Supplements SA and SB.

IEEE 1547, Interconnection and Interoperability of Distributed Energy Resources (DERs) with Associated Electric Power Systems (EPSs) Interfaces, Issue Date 02/15/2018

IEEE 1547.1, IEEE Standard Conformance Test Procedures for Interconnecting Distributed Energy Resources (DERs) with Electric Power Systems (EPSs) Associated Interfaces, Issue Date 03/05/2020.

UL 62109-1, Safety of Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements; IEC 62109-2, Safety of Power Converters for use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters.

CAN/CSA C22.2 No. 62109-1, Safety of Power Converters for use in photovoltaic power systems - Part 1: General Requirements, 2016/07

CAN/CSA C22.2 No. 62109-2, Safety of Power Converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters, 2016/07

[x] R21: The evaluation to the Standards above provides evidence of compliance to the intent of the existing California Rule 21 Interconnection (references to the past publication of IEEE 1547 standards) and UL1741 Table SA1.1 option to use the IEEE 1547.1-2020 and UL1741SB test methods in conjunction with using IEEE 1547-2018 as the SRD under which SA11.2 Normal Ramp Rate is not addressed. Additional testing was conducted to confirmed compliance to Normal Ramp Rate SA11.2 . See also Appendix A.

[ ] 14H (SA): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V1.0, Interconnection Application.

[x] 14H (SB): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V2.0, Interconnection Application.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

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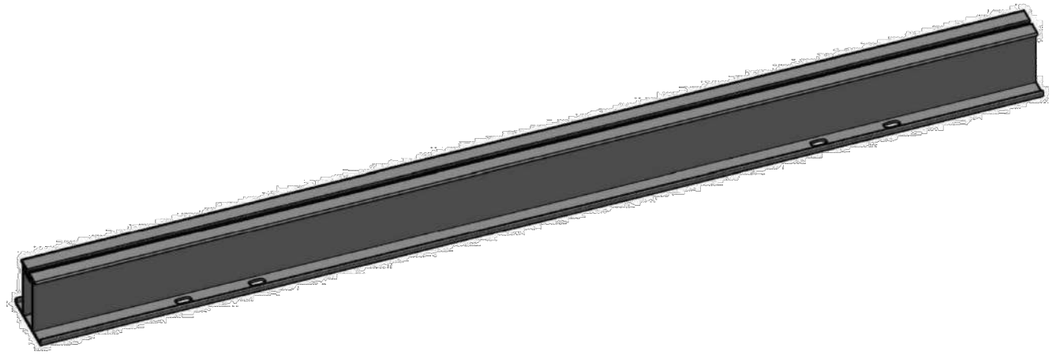
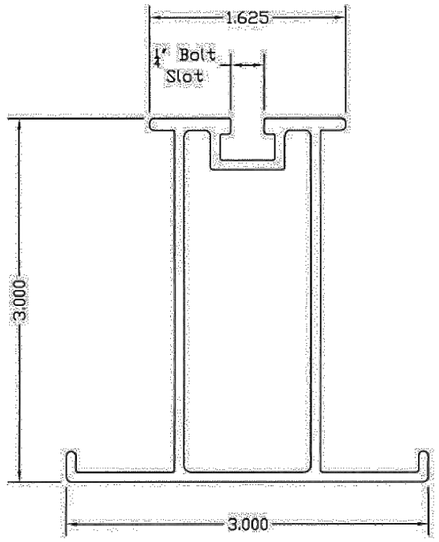
Solar Foundations® USA

SFUSA®
Ground Mount Rail





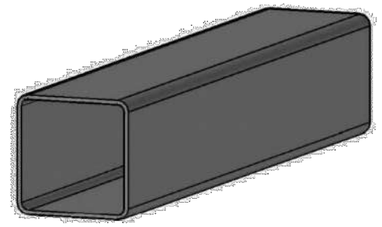
Rail Section Properties	
Axis X-X	**Value**
I (Moment of Inertia)	1.272 in^4
S (Section Modulus)	0.802 in^3
R (Radius of Gyration)	1.152 in
Axis Y-Y	**Value**
I (Moment of Inertia)	0.418 in^4
S (Section Modulus)	0.278 in^3
R (Radius of Gyration)	0.664 in
Area	0.947 in^2
Weight	1.085 lb/LF

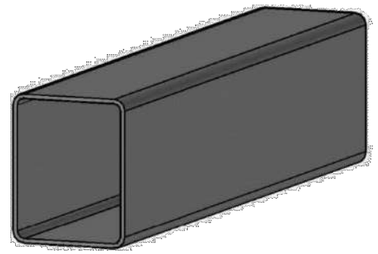
Item Number	Part Number	Description & Length	Panel Width	Typical Configuration	Material	Weight	Patent
1	R162	SFUSA Ground Mount Rail, 162”	38.58” – 39.41”	4 Panels High in Landscape	Aluminum 6005A – T61	15.3 lbs.	Patent No. 8,776,454 Patent No. 9,249,994 Patent No. 9,660,569
2	R171	SFUSA Ground Mount Rail, 171”	39.42” – 41.20”	4 Panels High in Landscape		16.1 lbs.	
3	R202	SFUSA Ground Mount Rail, 202”	38.58” – 39.41”	5 Panels High in Landscape		19.0 lbs.	
4	R212	SFUSA Ground Mount Rail, 212”	39.42” – 41.20”	5 Panels High in Landscape		20.0 lbs.	
5	R242	SFUSA Ground Mount Rail, 242”	38.58” – 39.41”	6 Panels High in Landscape		22.8 lbs.	
6	R254	SFUSA Ground Mount Rail, 254”	39.42” – 41.20”	6 Panels High in Landscape		23.9 lbs.	
7	R288	SFUSA Ground Mount Rail, 288”	39.42” – 41.20”	Custom		27.1 lbs.	

1142 River Road, New Castle, DE 19720 | Phone (855) 738-7200 | Fax (866) 644-5665 | **www.solarfoundationsusa.com**

Solar Foundations® USA

SFUSA®
Horizontal Beams
Hollow Structural Sections
(HSS)





4”x4” HDG Hollow Structural	
Axis X-X	**Value**
I (Moment of Inertia)	4.40 in^4
S (Section Modulus)	2.20 in^3
r (Radius of Gyration)	1.580 in
Z (Plastic Modulus)	2.560 in^3
Axis Y-Y	**Value**
I (Moment of Inertia)	4.40 in^4
S (Section Modulus)	2.20 in^3
r (Radius of Gyration)	1.580 in
Z (Plastic Modulus)	2.560 in^3
Wall Thickness	0.116 in
Area	1.770 in^2
Weight	6.448 plf

5”x4” HDG Hollow Structural	
Axis X-X	**Value**
I (Moment of Inertia)	7.42 in^4
S (Section Modulus)	2.97 in^3
r (Radius of Gyration)	1.93 in
Z (Plastic Modulus)	3.50 in^3
Axis Y-Y	**Value**
I (Moment of Inertia)	5.27 in^4
S (Section Modulus)	2.64 in^3
r (Radius of Gyration)	1.62 in
Z (Plastic Modulus)	3.01 in^3
Wall Thickness	0.116 in
Area	2.00 in^2
Weight	7.298 plf

Part Number	Description	Material	Yield Strength	Finish
TS5418.75	5”x4” HDG Rectangular Hollow Structural Section (HSS), 1/8” wall, 18.75’ Long	ASTM A500 high yield	60 ksi yield minimum	Hot Dipped Galvanized to ASTM A123 / A123M
TS5420	5”x4” HDG Rectangular Hollow Structural Section (HSS), 1/8” wall, 20’ Long			
TS4418.75	4”x4” HDG Rectangular Hollow Structural Section (HSS), 1/8” wall, 18.75’ Long			
TS4420	4”x4” HDG Rectangular Hollow Structural Section (HSS), 1/8” wall, 20’ Long			

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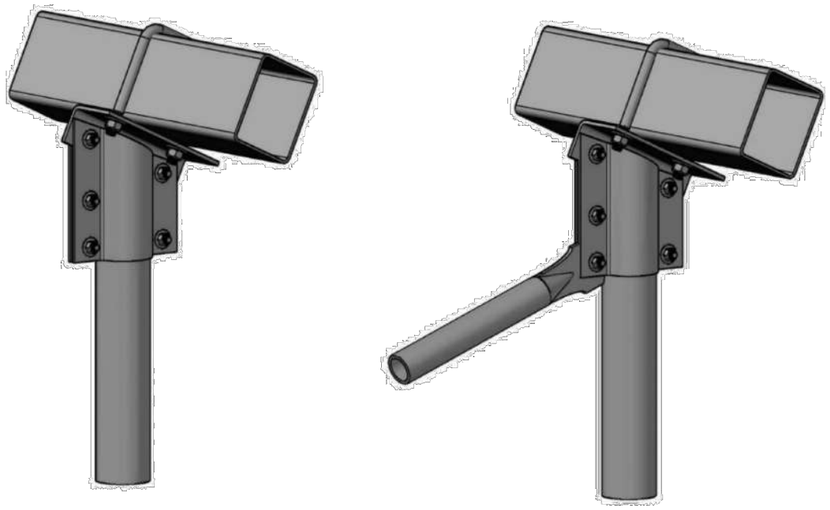
SFUSA®
Column Cap



Item Number	Part Number	Description	Material	Finish	Patent	Quantity Required
1	CHW	West Cap Half	ASTM A1011 CS Type B	Hot-dipped galvanized in accordance with ASTM A153/A153M	Patent No. 8,939,143 8,939,144 9,571,029 9,660,568	1
2	CHE	East Cap Half				
3	LPL	L-Plate for 00-20 Degree Array Tilt	ASTM A36			
4	LPS	L-Plate for 18-35 Degree Array Tilt				
5	LPH	L-Plate for 32-47 Degree Array Tilt				
6	B6G1.25	3/8”-16 HDG Hex Head Bolt, 1.25” Long	SAE Grade 5			5
7	NH6G	3/8”-16 HDG Heavy Hex Nut	SAE Grade 2			5
8	W6G	3/8” HDG USS Series Flat Washers				16 (North) 13 (South)
9	BU54	1/2” Square Bend U-Bolt (5x4 HSS)	Grade 2			1
10	BU44	1/2” Square Bend U-Bolt (4x4 HSS)				

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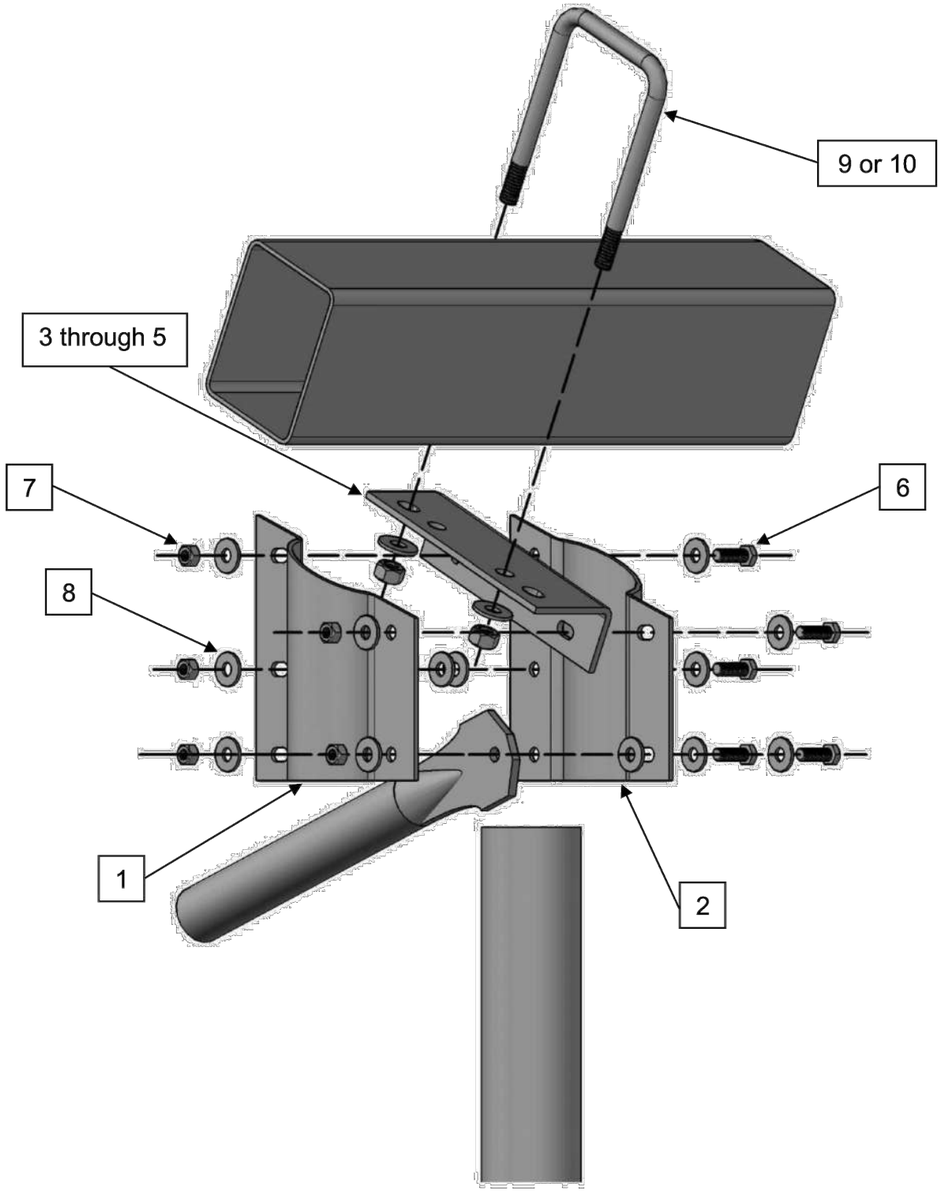

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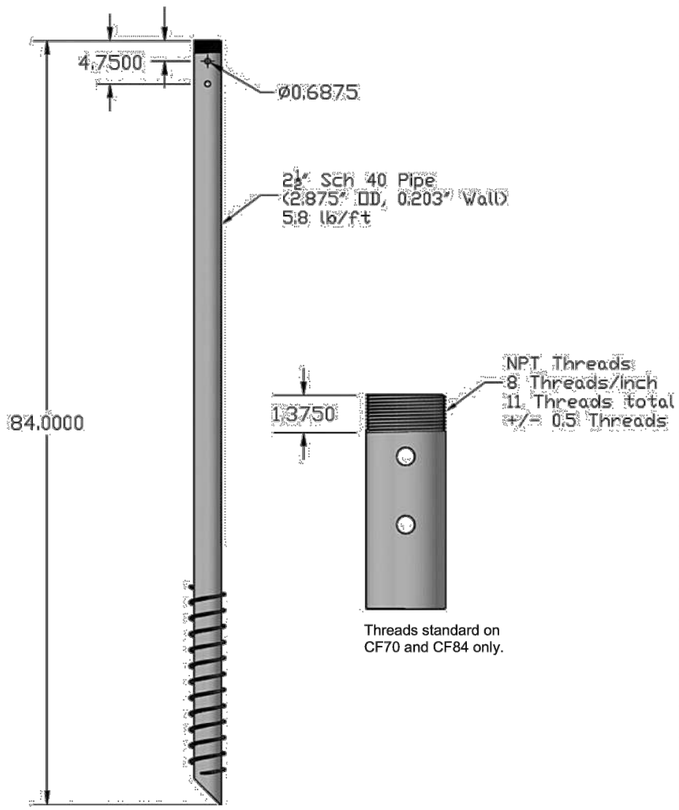
Solar Continuous Flight
Helical Pile

Part Number	Description	Material	Finish	Patent
CF70	2.50" Sch 40 HDG Continuous Flight Helical Pile w/ NPT Threads, 70" Long	ASTM A500 Grade C	Hot-Dipped Galvanized to ASTM A123/A123M	Patent Pending
CF84	2.50" Sch 40 HDG Continuous Flight Helical Pile w/ NPT Threads, 84" Long			
CF126	2.50" Sch 40 HDG Continuous Flight Helical Pile, 126" Long			



2½" Schedule 40 Round Pile Section Properties	
Axis X-X Value	**Value**
I (Moment of Inertia)	1.450 in^4
S (Section Modulus)	1.010 in^3
r (Radius of Gyration)	0.952 in
Z (Plastic Modulus)	1.370 in^3
Axis Y-Y Value	**Value**
I (Moment of Inertia)	1.450 in^4
S (Section Modulus)	1.010 in^3
r (Radius of Gyration)	0.952 in
Z (Plastic Modulus)	1.370 in^3
Outside Diameter	2.875 in
Wall Thickness	0.203 in
Area	1.590 in^2
Weight	5.813 lb/lf
Installation Torque Factor	8-9
Axial Compressive Load Limit	47,000 lbs
Axial Tensile Load Limit	47,000 lbs
Torsional Installation Limit	5,000 ft-lb
Max Developed Axial Capacity	40,000 lbs
Max Lateral Load Capacity	2,300 lbs

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