

**SCOPE OF WORK**

TO INSTALL A RESIDENTIAL ROOFTOP SOLAR PHOTOVOLTAIC (PV) SYSTEM.  
 THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE  
 UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.  
 THE PV SYSTEM DOES NOT INCLUDE BATTERIES.

**ELECTRICAL NOTES**

- 1) ALL EQUIPMENT TO BE LISTED BY THE UL OR OTHER NRTL AND LABELED FOR ITS APPLICATION.
- 2) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600V AND 90°C WET ENVIRONMENT.
- 3) WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- 4) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- 5) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- 6) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- 7) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- 8) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- 9) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR THE ILSCO GBL-4DBT LAY-IN LUG.
- 10) THE POLARITY OF THE GROUNDED CONDUCTORS IS (positive/negative) OR THE DC SIDE OF THE PV SYSTEM IS UNGROUNDED AND SHALL COMPLY WITH NEC 690.35

**NCDOT REQUIREMENTS**

**\*OPTION 2\***

WEIGHT OF PV SYSTEM ON ROOF:

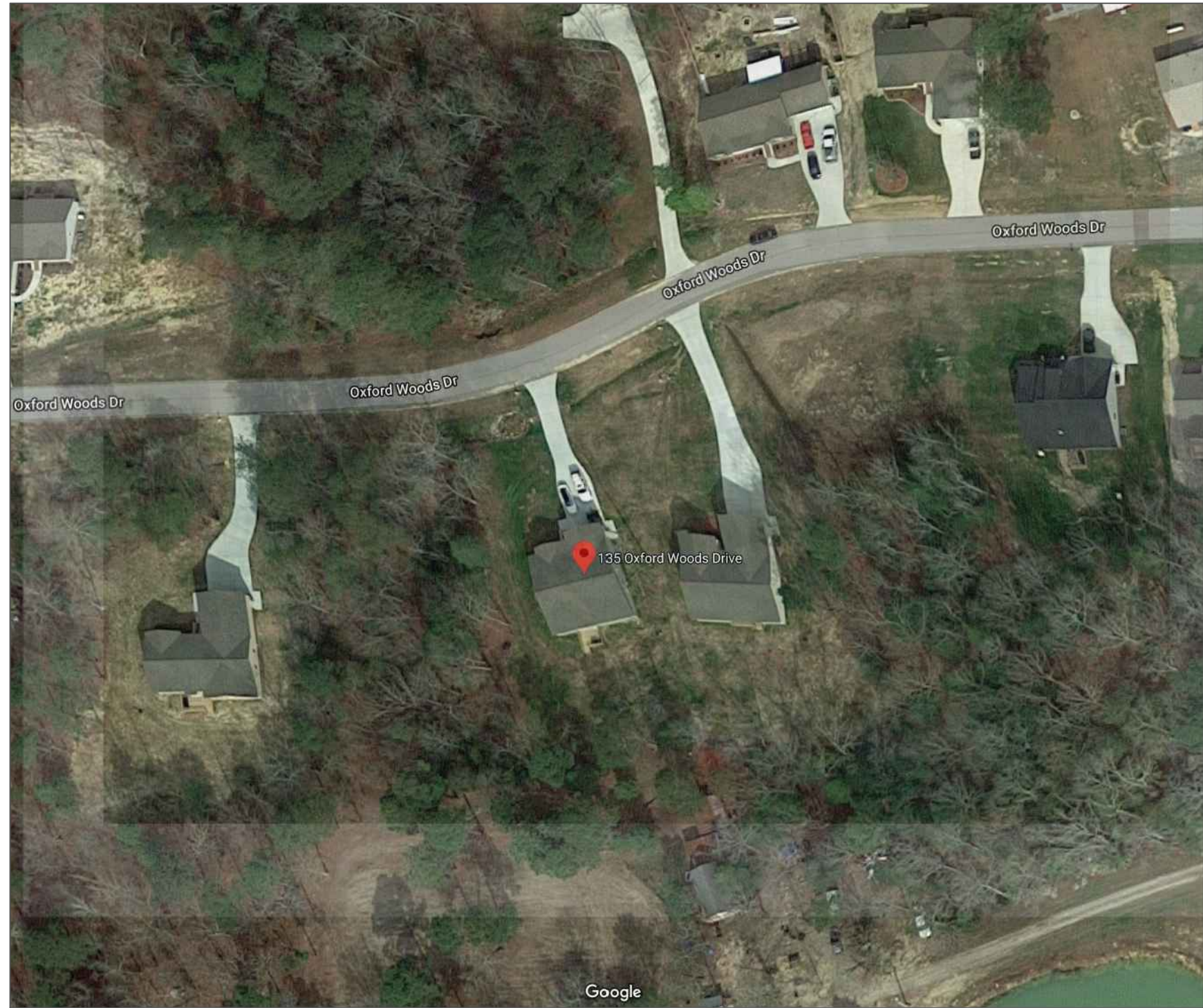
**2.6773 PSF**

EXISTING ROOF MATERIAL TYPE:

**ASPHALT SHINGLES (SINGLE LAYER)**

PROJECT LOCATION WIND ZONE:

**115 MPH**



**VICINITY MAP**

**CONTRACTOR**



**SUN DOLLAR ENERGY, LLC**  
 4904 ELAINE AVENUE  
 RALEIGH, NC 27616  
 (919) 508-6907  
 NC ELE LICENSE #: 30043U  
 NC GC LICENSE #: 73462

**PROJECT & CLIENT INFORMATION**

**ALVAREZ RESIDENCE  
 NEW SOLAR PV SYSTEM**  
 SYSTEM SIZE: 6.4 KW DC  
 SYSTEM SIZE: 7.6 KW AC

**HAROLD ALVAREZ**  
 135 OXFORD WOODS DR  
 ANGIER, NC 27501  
 (919) 999-0066

**ENGINEER OF RECORD**



**DRAWING BY**

**GBR**

**REVISIONS**

DESCRIPTION	DATE	#	BY
RELEASED FOR PERMITTING	10/19/2020	1	GBR

**SHEET SIZE**

**ANSI B  
 11" X 17"**

**DATE**

**10/19/2020**

**SHEET NAME**

**GENERAL  
 INFORMATION**

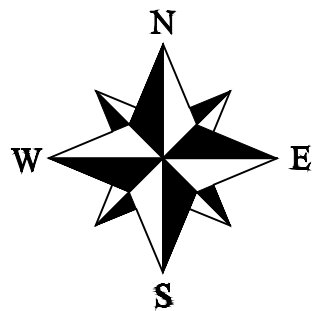
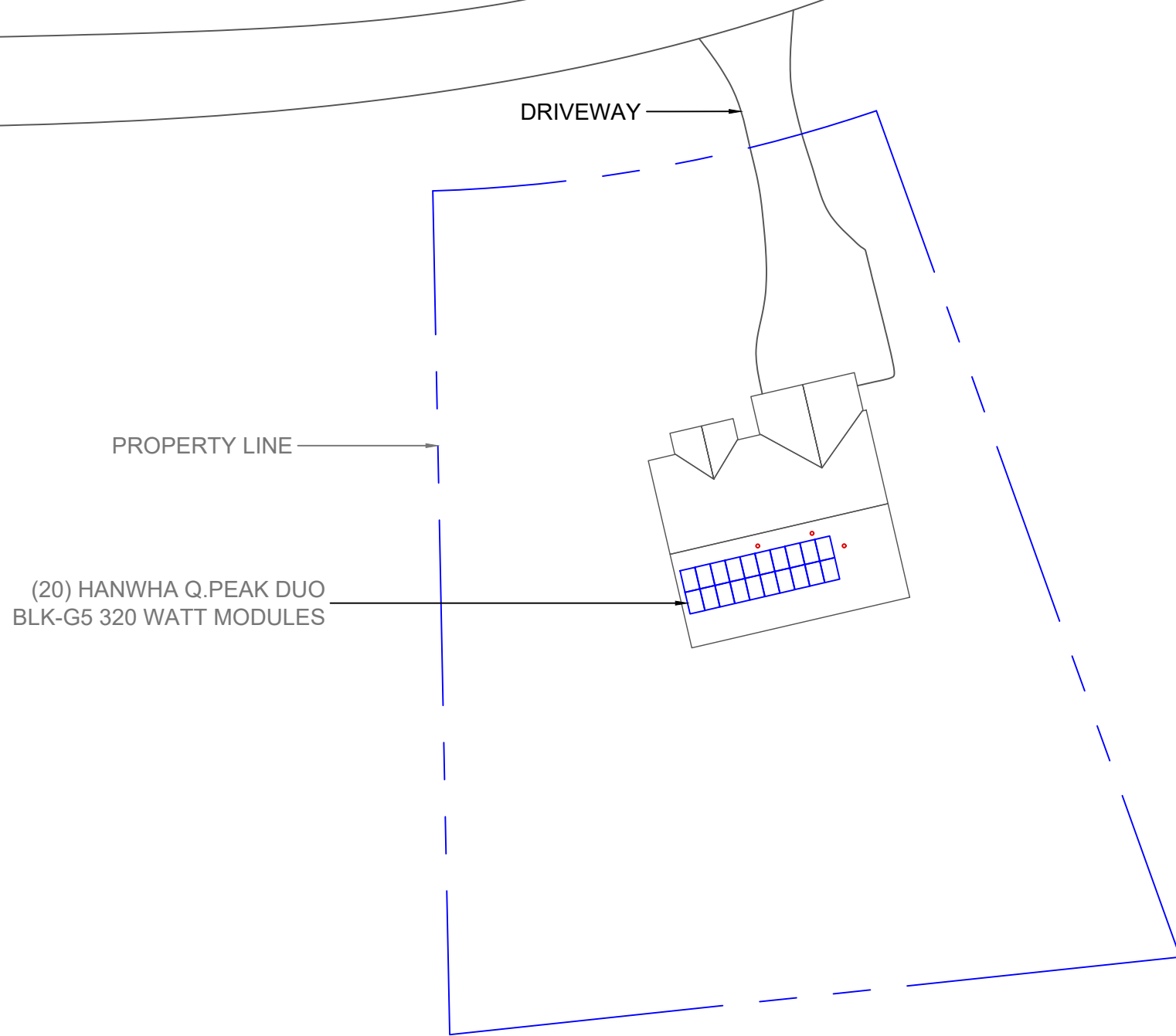
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**COVER**

SHEET INDEX		GOVERNING CODES	DESIGN SPECIFICATIONS		SYSTEM SPECIFICATIONS	
COVER	GENERAL INFORMATION	NFPA 70 NATIONAL ELECTRICAL CODE 2017	CONSTRUCTION TYPE	SINGLE-FAMILY	SOLAR MODULES	(20) HANWHA Q.PEAK DUO BLK-G5 320 WATT MODULES
PV-1	SITE PLAN	2018 INTERNATIONAL BUILDING CODE	ZONING	RESIDENTIAL	POWER OPTIMIZERS	(20) SOLAREEDGE P340
PV-2	ROOF LAYOUT AND MOUNTING DETAIL	2018 NORTH CAROLINA BUILDING CODE	GROUND SNOW LOAD	20 PSF	INVERTER(S)	(1) SOLAREEDGE SE7600H-US
PV-3	ELECTRICAL SCHEMATIC	2018 NORTH CAROLINA RESIDENTIAL CODE	WIND EXPOSURE CATEGORY	CATEGORY B	SOLAR MOUNTS	QUICKMOUNT PV L-MOUNTS
PV-4	AMPACITY CALCULATIONS AND WIRE SIZING	UNDERWRITERS LABORATORIES (UL) STANDARDS	WIND SPEED	115 MPH	SOLAR RACKING SYSTEM	EVEREST CROSSRAIL X48
PV-5	LABELING SCHEDULE	OSHA 29 CFR 1910.269	UTILITY PROVIDER	DUKE PROGRESS	MONITORING	YES
CUTSHEETS	MANUFACTURER SPECIFICATION SHEETS	NORTH CAROLINA DEPARTMENT OF INSURANCE	AHJ	HARNETT COUNTY	POINT OF INTERCONNECT	40A/2P LOAD SIDE BREAKER IN MSP

# PROPERTY PLAN

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



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**SITE PLAN**

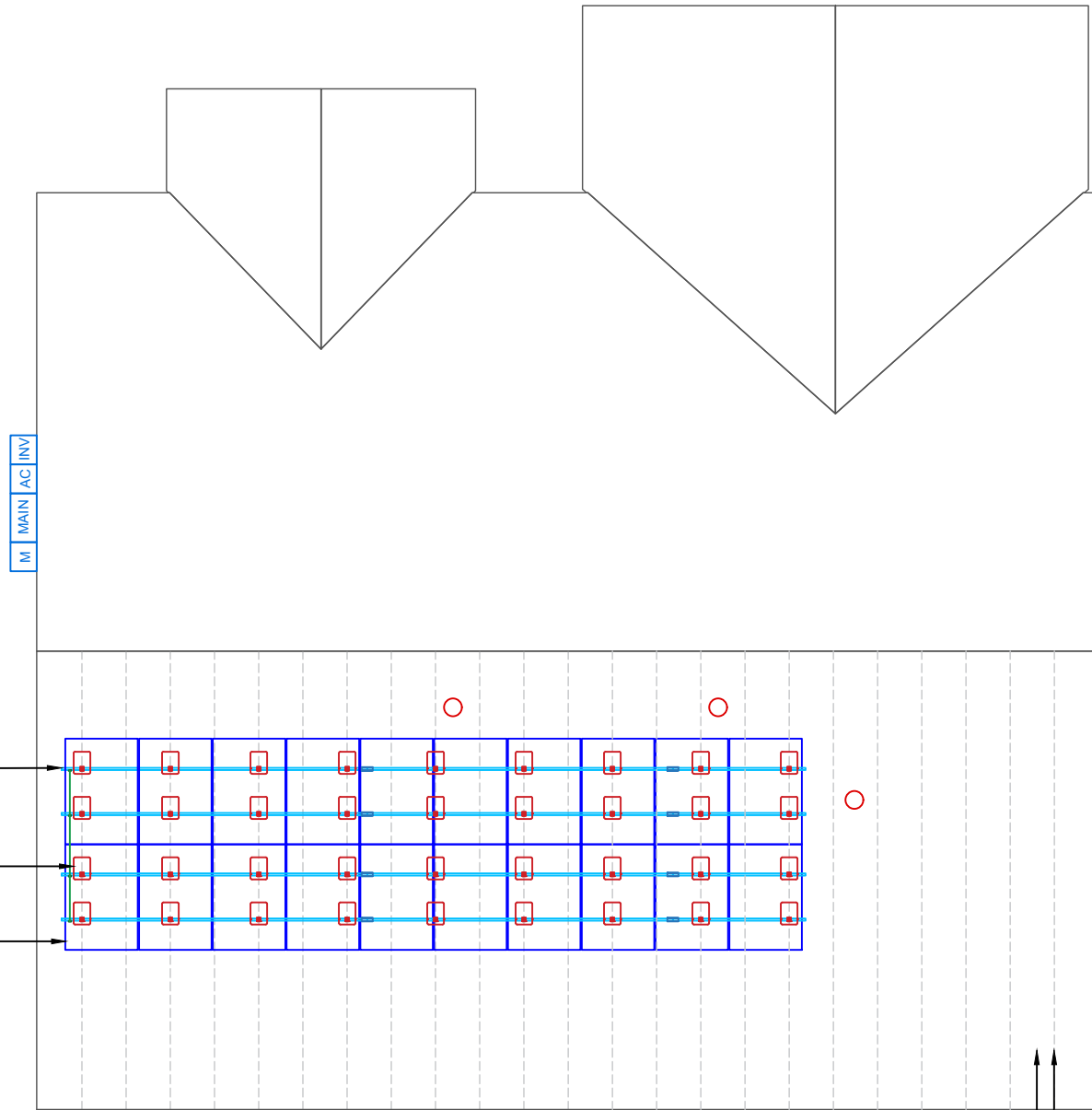
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**PV-1**

# ROOF PLAN

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

ROOF 1 PITCH: 30°



LOAD CALCULATIONS		
NUMBER OF MODULES	20	
MODULE WEIGHT	41.23	LBS
MODULE SQ FT	18.138	SQ FT
TOTAL MODULE WEIGHT	824.6	LBS
TOTAL MODULE SQ FT	362.76	SQ FT
NUMBER OF PORTRAIT	20	
NUMBER OF LANDSCAPE	0	
NUMBER OF OPTIMIZERS	20	
WEIGHT PER OPTIMIZER	1.5	LBS
TOTAL OPTIMIZER WEIGHT	30	LBS
TOTAL LENGTH OF RAIL	134	LF
RAIL WEIGHT PER FOOT	0.56	LBS
TOTAL RAIL WEIGHT	75.04	LBS
NUMBER OF FLANGES	36	
WEIGHT PER FLANGE	0.7565	LBS
WEIGHT PER SYSTEM	27.234	LBS
NUMBER OF MID CLAMPS	36	
MID CLAMP WEIGHT	0.21	LBS
WEIGHT PER SYSTEM	7.56	LBS
NUMBER OF END CLAMPS	8	
END CLAMP WEIGHT	0.32	LBS
WEIGHT PER SYSTEM	6	LBS
NUMBER OF SPLICES	8	
WEIGHT PER SPLICE	0.1	LBS
WEIGHT PER SYSTEM	0.8	LBS
TOTAL ARRAY WEIGHT	971.234	LBS
POINT LOAD	26.97872	LBS/FT
TOTAL ARRAY AREA	362.76	SQ FT
<b>ARRAY DEAD LOAD</b>	<b>2.6773</b>	<b>PSF</b>



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ROOF LAYOUT &  
 DETAIL DRAWINGS

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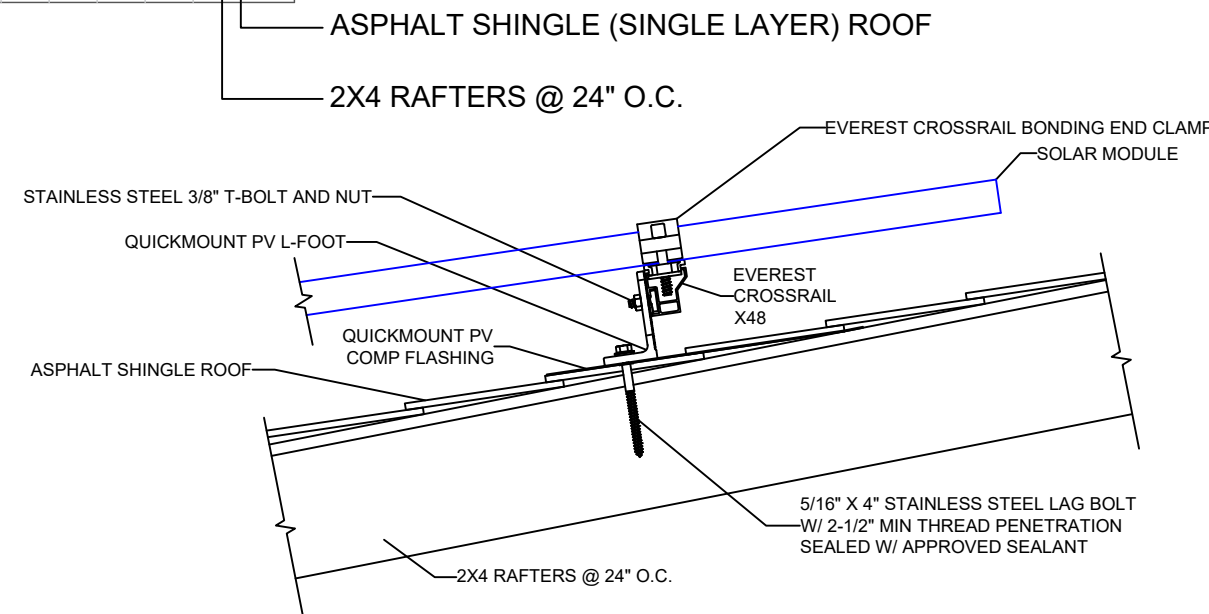
PV-2

Flashings/Mounts	
Manufacturer	Quickmount PV
Mount Type	L-Mount
Flashing Material	Aluminum
Flashing Size	9" x 12" x .04"
Fastener Type	Lag Screw
Fastener Material	18-8 Stainless Steel
Fastener Size	5/16" x 4"
L-Foot Material	Aluminum
Sealing Washer	EPDM Bonded SS
Sealing Washer Size	5/16" ID x 3/4" OD
Weight	0.7565 Lbs.
Structural	IBC Compliant
UL Listing	UL 2703

Racking	
Manufacturer	Everest Solar
Model Number	Crossrail 48-X
Length	166"
Width	1.54"
Height	1.89"
Weight	0.56 Lbs./Ft
Material	Aluminum
Structural	IBC Compliant
UL Listing	UL 2703

**LEGEND**

UTILITY METER	DC DISCONNECT	PV METER	RAILS
MAIN SERVICE PANEL	JUNCTION BOX	EXTERIOR CONDUIT	GROUNDING
INVERTER	SUBPANEL	GAS METER	RAIL SPLICE
AC DISCONNECT	LOAD CENTER	FLASHINGS	



## SOLAR MOUNTING DETAIL

Solar PV Module Data	
Manufacturer	Hanwha
Model Number	Q.Peak DUO BLK-G5
Max Power (Pmax)	320
Max Power Voltage (Vmp)	33.8
Max Power Current (Imp)	9.47
Open Circuit Voltage (Voc)	40.56
Short Circuit Current (Isc)	9.94
Max Series Fuse (OCPD)	20
Max System Voltage	1000
UL Listing	UL1703
Protection Rating	IP67

Power Optimizer Data	
Manufacturer	SolarEdge
Model Number	P340
Rated DC Input Power	340
Max Input Voltage	48
Max Input Current	13.75
Max Short Circuit Current	11
Max Output Voltage	60
Max Output Current	15
UL Listing	UL1741
Protection Rating	IP68/NEMA6P

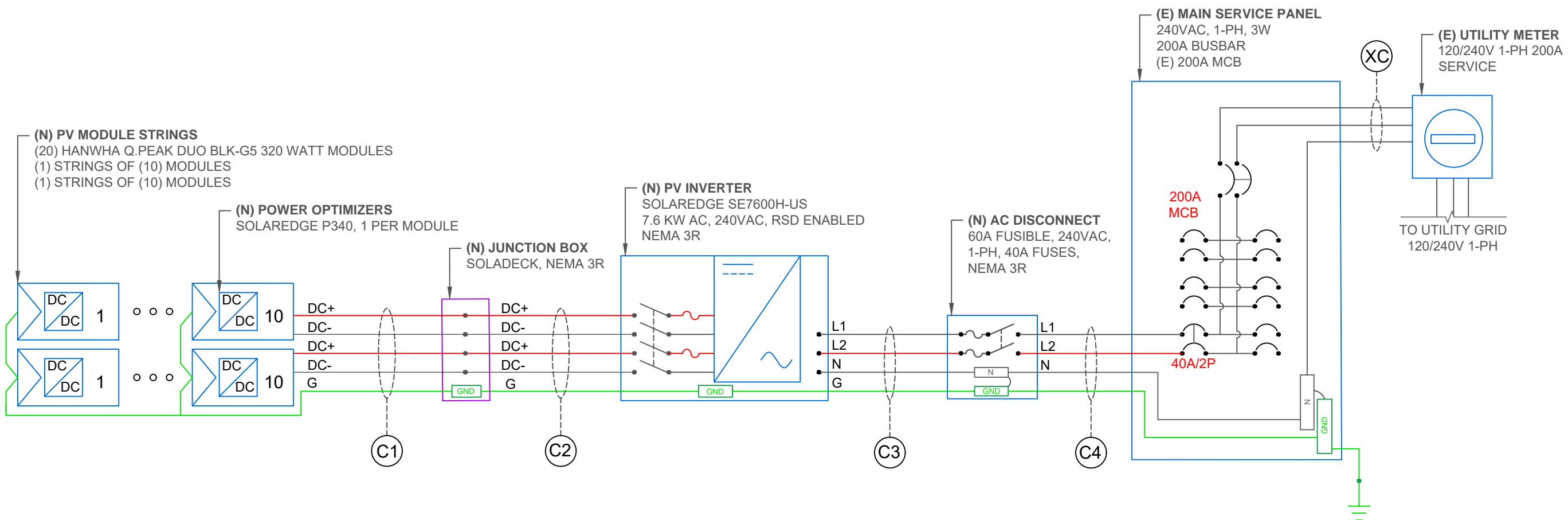
Junction Box Data	
Manufacturer	Soladeck
Model Number	0799-5B
Voltage Rating	600
Amperage Rating	120
UL Listing	UL 50
Enclosure Rating	NEMA 3R

Temperature Data	
Average High Temp	93.2° F
Record Low Temp	10.4° F

Inverter Data	
Manufacturer	SolarEdge
Model Number	SE7600H-US
Max DC Input Voltage	480
Nominal DC Input Voltage	400
Max DC Input Current	20
Max DC Short Circuit Current	45
Max DC Input Power	11800
Max AC Output Power	7600
Nominal AC Output Voltage	240
Max AC Output Current	32
Strings Per Inverter	1 - 2
UL Listing	UL1741
Enclosure Rating	NEMA 4X

AC Disconnect Data	
Manufacturer	GE
Model Number	TG3222R
Voltage Rating	240
Amperage Rating	60
Phase	Single
Switch Style	Fusible
Fuse Rating	40
UL Listing	UL 98
Enclosure Rating	NEMA 3R

Main Service Panel Data	
Manufacturer	Eaton
Model Type	Load Center
Model Number	N/A
Voltage Rating	120/240
Busbar Amp Rating	200
Main Breaker/Main Lug	Main Breaker
Breaker Amp Rating	200
Phase	Single
UL Listing	UL 67
Enclosure Rating	NEMA 1



WIRE SCHEDULE													
TAG	CURRENT CARRYING CONDUCTORS				GROUNDING CONDUCTORS				CONDUIT/RACEWAY				NOTES
	QTY.	SIZE	MATERIAL	INSULATION TYP.	QTY.	SIZE	MATERIAL	INSULATION TYP.	QTY.	SIZE	MATERIAL	LOCATION	
C1	4	10 AWG	COPPER	PV WIRE	1	8 AWG	BARE COPPER	N/A	-	-	-	FREE AIR	
C2	4	10 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	3/4"	LFMC/EMT	EXTERIOR/INTERIOR	
C3	3	8 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	3/4"	LFNC/EMT	EXTERIOR	
C4	3	8 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	3/4"	LFNC/EMT	EXTERIOR	
XC	-	-	-	-	-	-	-	-	-	-	-	-	

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**SHEET NAME**  
**ELECTRICAL SCHEMATIC**

**SHEET NUMBER**  
**PV-3**

## Ampacity Calculations

Wiring Location: Module to Power Optimizer (Direct Current)  
 Wiring Location: Inverter to Service Entrance (Alternating Current)  
 All calculations show minimum sizing for ampacity  
 Actual wire sizing may be larger for voltage drop or other factors  
 All calculations are according to the 2017 National Electric Code

**Modules: Hanwha Q-Peak DUO BLK-G5 320**  
**Inverter: SolarEdge SE7600H-US**

### Initial Input Values

Isc (Short Circuit Current)	9.94				
Number of circuits	9.94	x	1	=	9.94
Maximum Circuit Current (NEC 690.8 (A)(1+2))	9.94	x	156%	=	15.5064
Minimum Overcurrent Device	20	A	Series Fuse Rating by Manufacturer		
Chosen Conductor Type (THHN, RHW-2, or USE-2)	10	Size AWG #			

### Conductor Derating

NEC 690.31 © ref (NEC 310.16)					
Conductor 90°C Ampacity	40				
Conduit Fill Derating	4-6	x	0.8	=	32
Temperature Derating (°F)	132-140	x	0.71	=	22.72

### Ampacity vs Overcurrent

<b>Device</b>				
Conductor Ampacity Check	22.72	15.5064		OK
Conductor to Overcurrent Check	22.72	20		OK

Input Data Into Yellow Fields

Green Field must say OK

Use this calculation for over current protection and wire sizing for stringers coming from Solar Panels.  
 Isc comes from manufacturer

## Ampacity Calculations

Wiring Location: Inverter to Service Entrance (Alternating Current)  
 All calculations show minimum sizing for ampacity  
 Actual wire sizing may be larger for voltage drop or other factors  
 All calculations are according to the 2017 National Electric Code

**Modules: Hanwha Q-Peak DUO BLK-G5 320**  
**Inverter: SolarEdge SE7600H-US**

### Initial Input Values

Inverter Continuous AC Output Combined (Watts)	7600
Minimum Operating Voltage	240

Inverter Continuous AC Amps	32	Watts	7600	/	Volts	240	=	Amps	32
Number of Inverters	32	x	1	=	32				

### Overcurrent Device Rating

NEC 690.8 (B)(3)	32	x	125%	=	40
Minimum Overcurrent Device	40	Amps			
Circuit Breaker Size per NEC 240.6(A)	40	Amps			

Size AWG #

Chosen Conductor Type (THHN, THWN, RHW-2 or USE-2)	8
--	---

### Conductor Derating

NEC 690.31© ref (NEC 310.16)					
Conductor 90°C Ampacity	55				
Conduit Fill Derating	1-3	x	0.91	=	50.05
Temperature Derating (°F)	96-104	x	0.91	=	50.05

### Ampacity vs Overcurrent

<b>Device</b>				
Conductor Ampacity Check	50.05	40		OK
Conductor to Overcurrent Check	50.05	40		OK

Input Data into Yellow Fields

Green Fields must say OK

Use this calculation for over current protection and wire sizing for inverter

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AMPACITY  
 CALCULATIONS

SHEET NUMBER

PV-4

**SIGNAGE REQUIREMENTS**

- > WARNING SIGNS OR LABELS SHALL COMPLY WITH NEC 110.21(B)
- > MIN. 3/8" LETTER HEIGHT
- > ALL CAPITAL LETTERS
- > ARIAL OR SIMILAR FONT
- > REFLECTIVE, WEATHER RESISTANT MATERIAL, UL 969

# PV LABELS

**PHOTOVOLTAIC SYSTEM  
DC DISCONNECT**

OPERATING VOLTAGE:  VDC  
 OPERATING CURRENT:  AMPS  
 MAX SYSTEM VOLTAGE:  VDC  
 SHORT CIRCUIT CURRENT:  AMPS  
 CHARGE CONTROLLER MAX:  AMPS

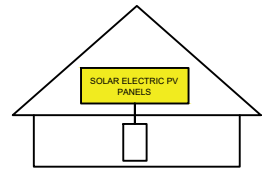
NEC 690.53 1  
 APPLY TO:  
 INVERTER

**WARNING: PHOTOVOLTAIC POWER SOURCE**

NEC 690.31(G)(3)(4) 2  
 APPLY TO:  
 SOLAR DC CONDUIT

**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



NEC 690.56(C)(1)(a) 3  
 APPLY TO:  
 SOLAREGE INVERTERS

**WARNING**

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

NEC 690.13(B) 4  
 APPLY TO:  
 DISCONNECTS  
 SOLAR LOAD CENTERS  
 COMBINER BOXES

**RAPID SHUTDOWN  
SWITCH FOR  
SOLAR PV SYSTEM**

NEC 690.5(C)(3) 5  
 APPLY TO:  
 SMA AND SOLAREGE INVERTERS

**PHOTOVOLTAIC SYSTEM  
AC DISCONNECT**

OPERATING VOLTAGE:  VDC  
 OPERATING CURRENT:  AMPS

NEC 690.54 6  
 APPLY TO:  
 AC DISCONNECT

**WARNING**

TURN OFF PHOTOVOLTAIC  
 AC DISCONNECT PRIOR TO  
 WORKING INSIDE PANEL

NEC 110.27(C) & OSHA 1910.145(f)(7) 7  
 APPLY TO:  
 COMBINER BOXES  
 ENCLOSURES  
 BREAKER PANEL  
 MAIN SERVICE DISCONNECT

**SOLAR PV BREAKER**

BREAKER IS BACKFED  
 DO NOT RELOCATE

NEC 690.64(B)(7) & NEC 705.12(B)(2) 8  
 APPLY TO:  
 PV SYSTEM BREAKER

**WARNING**

DUAL POWER SUPPLY  
 SOURCES: UTILITY GRID AND  
 PV SOLAR ELECTRIC SYSTEM

NEC 705.12(D)(3) & NEC 690.64 9  
 APPLY TO:  
 MAIN SERVICE PANEL  
 METER

**DC JUNCTION BOX**


**WARNING**

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

PHOTOVOLTAIC  
 POWER SOURCE

NEC 690.31(G)(2) 10  
 APPLY TO:  
 DC JUNCTION BOXES

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**PV-5**

# Q.PEAK DUO BLK-G5 300-320

## Q.ANTUM SOLAR MODULE

The new **Q.PEAK DUO BLK-G5** solar module from Q CELLS impresses with its outstanding visual appearance and particularly high performance on a small surface thanks to the innovative **Q.ANTUM DUO** Technology. Q.ANTUM's world-record-holding cell concept has now been combined with state-of-the-art circuitry half cells and a six-busbar design, thus achieving outstanding performance under real conditions — both with low-intensity solar radiation as well as on hot, clear summer days.



### Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY

Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.3%.



### INNOVATIVE ALL-WEATHER TECHNOLOGY

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



### ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology<sup>1</sup>, Hot-Spot Protect and Traceable Quality Tra.Q™.



### EXTREME WEATHER RATING

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



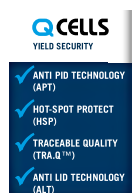
### A RELIABLE INVESTMENT

Inclusive 12-year product warranty and 25-year linear performance guarantee<sup>2</sup>.

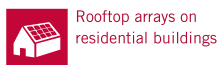


### STATE OF THE ART MODULE TECHNOLOGY

Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.



### THE IDEAL SOLUTION FOR:



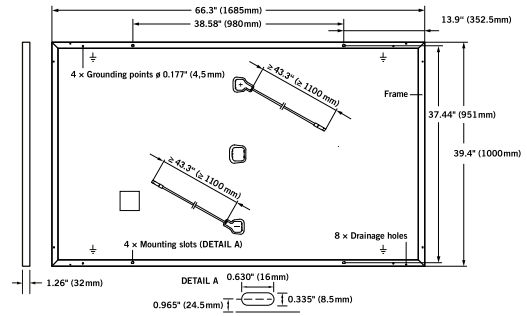
Engineered in **Germany**

**Q CELLS**

<sup>1</sup> APT test conditions according to IEC/TS 62804-1:2015, method B (-1500V, 168 h)  
<sup>2</sup> See data sheet on rear for further information.

## MECHANICAL SPECIFICATION

<b>Format</b>	66.3 in × 39.4 in × 1.26 in (including frame) (1685 mm × 1000 mm × 32 mm)
<b>Weight</b>	41.2 lbs (18.7 kg)
<b>Front Cover</b>	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
<b>Back Cover</b>	Composite film
<b>Frame</b>	Black anodized aluminum
<b>Cell</b>	6 × 20 monocrystalline Q.ANTUM solar half-cells
<b>Junction box</b>	2.76-3.35 in × 1.97-2.76 in × 0.51-0.83 in (70-85 mm × 50-70 mm × 13-21 mm), decentralized, IP67
<b>Cable</b>	4 mm <sup>2</sup> Solar cable; (+) ≥ 43.3 in (1100 mm), (-) ≥ 43.3 in (1100 mm)
<b>Connector</b>	Multi-Contact MC4, IP68

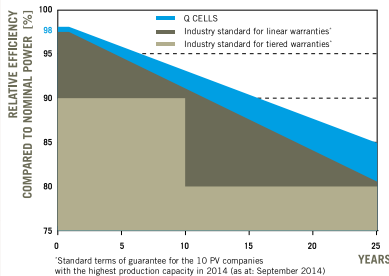


## ELECTRICAL CHARACTERISTICS

POWER CLASS			300	305	310	315	320
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC <sup>1</sup> (POWER TOLERANCE +5 W / -0 W)							
Minimum	Power at MPP <sup>1</sup>	$P_{MPP}$ [W]	300	305	310	315	320
	Short Circuit Current <sup>1</sup>	$I_{SC}$ [A]	9.72	9.78	9.83	9.89	9.94
	Open Circuit Voltage <sup>1</sup>	$V_{OC}$ [V]	39.48	39.75	40.02	40.29	40.56
	Current at MPP	$I_{MPP}$ [A]	9.25	9.31	9.36	9.41	9.47
	Voltage at MPP	$V_{MPP}$ [V]	32.43	32.78	33.12	33.46	33.80
	Efficiency <sup>1</sup>	$\eta$ [%]	≥ 17.8	≥ 18.1	≥ 18.4	≥ 18.7	≥ 19.0
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup>							
Minimum	Power at MPP	$P_{MPP}$ [W]	224.1	227.8	231.6	235.3	239.1
	Short Circuit Current	$I_{SC}$ [A]	7.83	7.88	7.92	7.97	8.01
	Open Circuit Voltage	$V_{OC}$ [V]	37.15	37.40	37.66	37.91	38.17
	Current at MPP	$I_{MPP}$ [A]	7.28	7.32	7.37	7.41	7.45
	Voltage at MPP	$V_{MPP}$ [V]	30.78	31.11	31.44	31.76	32.08

<sup>1</sup>Measurement tolerances  $P_{MPP} \pm 3\%$ ;  $I_{SC}, V_{OC} \pm 5\%$  at STC: 1000 W/m<sup>2</sup>, 25 ± 2 °C, AM 1.5 G according to IEC 60904-3 - <sup>2</sup>800 W/m<sup>2</sup>, NMOT, spectrum AM 1.5 G

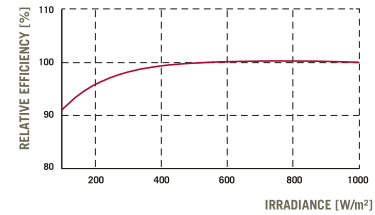
## Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year.  
At least 93.1% of nominal power up to 10 years.  
At least 85% 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 organization of your respective country.

## PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m<sup>2</sup>).

## TEMPERATURE COEFFICIENTS

Temperature Coefficient of $I_{SC}$	$\alpha$	[%/K]	+0.04	Temperature Coefficient of $V_{OC}$	$\beta$	[%/K]	-0.28
Temperature Coefficient of $P_{MPP}$	$\gamma$	[%/K]	-0.37	Normal Operating Module Temperature	NMOT	[°F]	109 ± 5.4 (43 ± 3 °C)

## PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage $V_{SYS}$	[V]	1000 (IEC) / 1000 (UL)	Safety Class	II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating	C (IEC) / TYPE 1 (UL)
Max. Design Load, Push / Pull (UL) <sup>2</sup>	[lbs/ft <sup>2</sup> ]	75 (3600 Pa) / 55 (2667 Pa)	Permitted module temperature on continuous duty	-40 °F up to +185 °F (-40 °C up to +85 °C)
Max. Test Load, Push / Pull (UL) <sup>2</sup>	[lbs/ft <sup>2</sup> ]	113 (5400 Pa) / 84 (4000 Pa)	<sup>2</sup> see installation manual	

## QUALIFICATIONS AND CERTIFICATES

UL 1703; VDE Quality Tested; CE-compliant;  
IEC 61215:2016; IEC 61730:2016, Application class A



## PACKAGING INFORMATION

Number of Modules per Pallet	32
Number of Pallets per 53' Trailer	30
Number of Pallets per 40' High Cube Container	26
Pallet Dimensions (L × W × H)	69.3 in × 45.3 in × 46.9 in (1760 mm × 1150 mm × 1190 mm)
Pallet Weight	1415 lbs (642 kg)

**NOTE:** Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.

300 Spectrum Center Drive, Suite 1250, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL inquiry@us.q-cells.com | WEB www.q-cells.us



# Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US /  
SE7600H-US / SE10000H-US / SE11400H-US



## Optimized installation with HD-Wave technology

- / Specifically designed to work with power optimizers
- / Record-breaking efficiency
- / Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- / Fixed voltage inverter for longer strings
- / Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- / UL1741 SA certified, for CPUC Rule 21 grid compliance
- / Extremely small
- / Built-in module-level monitoring
- / Outdoor and indoor installation
- / Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

# / Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/  
SE7600H-US / SE10000H-US / SE11400H-US

Model Number	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4							
<b>OUTPUT</b>								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5 <sup>(1)</sup>							Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
Power Factor	1, adjustable -0.85 to 0.85							
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
<b>INPUT</b>								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V <sup>(2)</sup>	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V <sup>(2)</sup>	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600k $\Omega$ Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W

<sup>(1)</sup> For other regional settings please contact SolarEdge support

<sup>(2)</sup> A higher current source may be used; the inverter will limit its input current to the values stated

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# Power Optimizer

For North America

P320 / P340 / P370 / P400 / P405 / P505

POWER OPTIMIZER



## PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

# / Power Optimizer

## For North America

P320 / P340 / P370 / P400 / P405 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
<b>INPUT</b>							
Rated Input DC Power <sup>(1)</sup>	320	340	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	125 <sup>(2)</sup>		Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	12.5 - 105		Vdc
Maximum Short Circuit Current (Isc)	11			10.1		14	Adc
Maximum DC Input Current	13.75			12.63		17.5	Adc
Maximum Efficiency	99.5						%
Weighted Efficiency	98.8					98.6	%
Overvoltage Category	II						
<b>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)</b>							
Maximum Output Current	15						Adc
Maximum Output Voltage	60			85			Vdc
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)</b>							
Safety Output Voltage per Power Optimizer	1 ± 0.1						Vdc
<b>STANDARD COMPLIANCE</b>							
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3						
Safety	IEC62109-1 (class II safety), UL1741						
RoHS	Yes						
<b>INSTALLATION SPECIFICATIONS</b>							
Maximum Allowed System Voltage	1000						Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters						
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1			129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9	129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in
Weight (including cables)	630 / 1.4			750 / 1.7	845 / 1.9	1064 / 2.3	gr / lb
Input Connector	MC4 <sup>(3)</sup>						
Output Wire Type / Connector	Double Insulated; MC4						
Output Wire Length	0.95 / 3.0		1.2 / 3.9				m / ft
Input Wire Length	0.16 / 0.52						m / ft
Operating Temperature Range	-40 - +85 / -40 - +185						°C / °F
Protection Rating	IP68 / NEMA6P						
Relative Humidity	0 - 100						%

<sup>(1)</sup> Rated STC power of the module. Module of up to +5% power tolerance allowed

<sup>(2)</sup> NEC 2017 requires max input voltage be not more than 80V

<sup>(3)</sup> For other connector types please contact SolarEdge

PV System Design Using a SolarEdge Inverter <sup>(4)(5)</sup>	Single Phase HD-Wave	Single phase	Three Phase 208V	Three Phase 480V	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400 P405 / P505	8	10	18	
Maximum String Length (Power Optimizers)		6	8	14	
Maximum String Length (Power Optimizers)		25	25	50 <sup>(6)</sup>	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	5250	6000 <sup>(7)</sup>	12750 <sup>(8)</sup>	W
Parallel Strings of Different Lengths or Orientations	Yes				

<sup>(4)</sup> For detailed string sizing information refer to: [http://www.solaredge.com/sites/default/files/string\\_sizing\\_na.pdf](http://www.solaredge.com/sites/default/files/string_sizing_na.pdf)

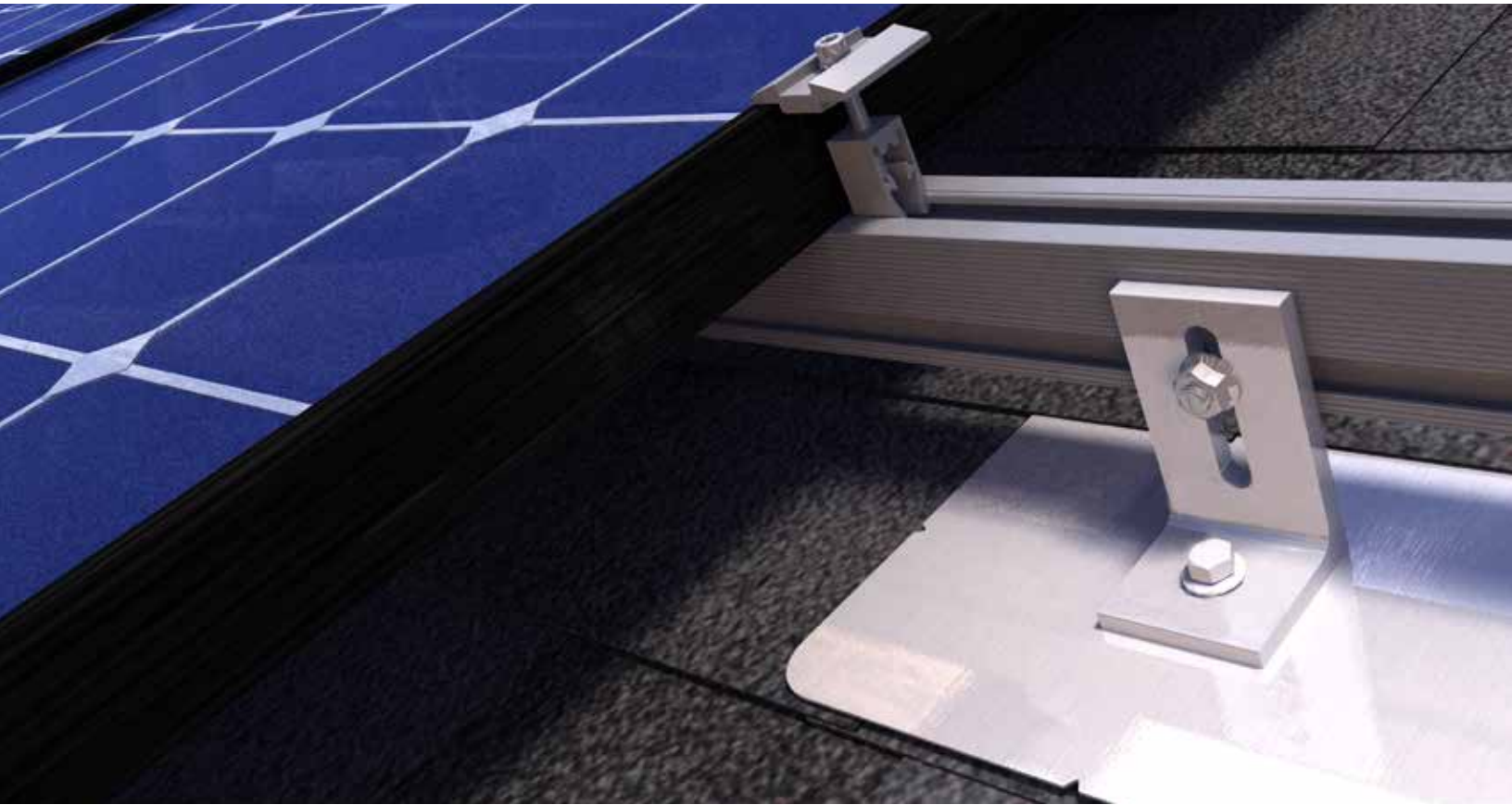
<sup>(5)</sup> It is not allowed to mix P405/P505 with P320/P340/P370/P400 in one string

<sup>(6)</sup> A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

<sup>(7)</sup> For SE14.4KUS/SE43.2KUS: It is allowed to install up to 6,500W per string when 3 strings are connected to the inverter (3 strings per unit for SE43.2KUS) and when the maximum power difference between the strings is up to 1,000W

<sup>(8)</sup> For SE30KUS/SE33.3KUS/SE66.6KUS/SE100KUS: It is allowed to install up to 15,000W per string when 3 strings are connected to the inverter (3 strings per unit for SE66.6KUS/SE100KUS) and when the maximum power difference between the strings is up to 2,000W

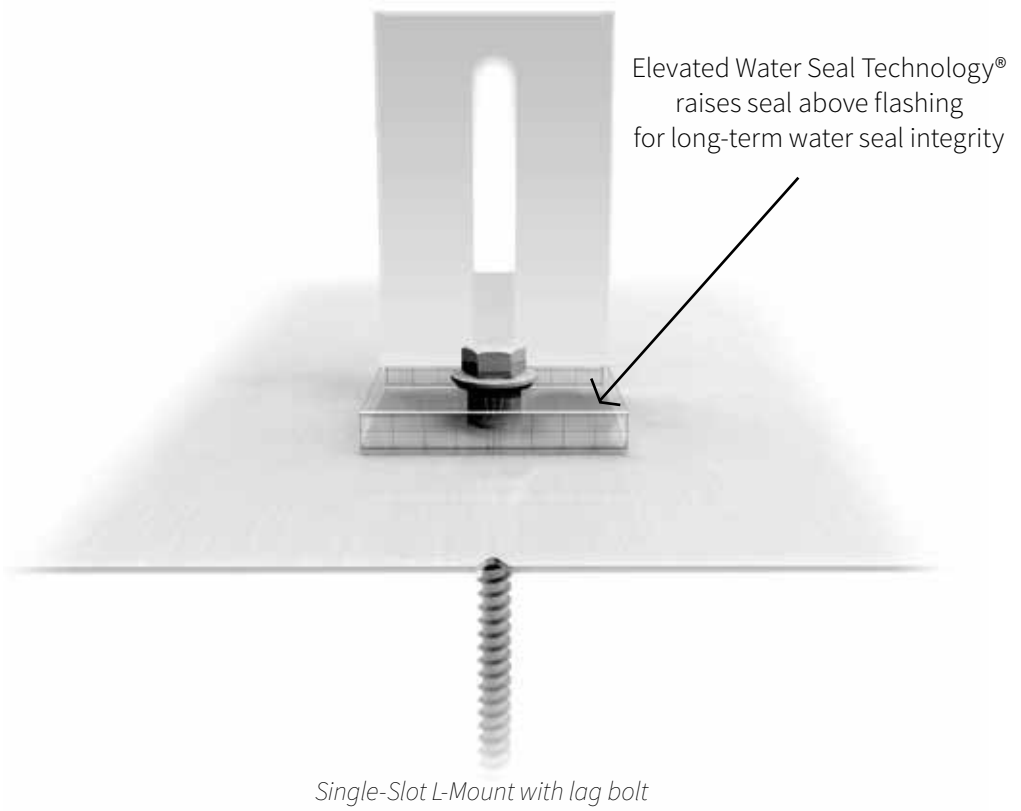
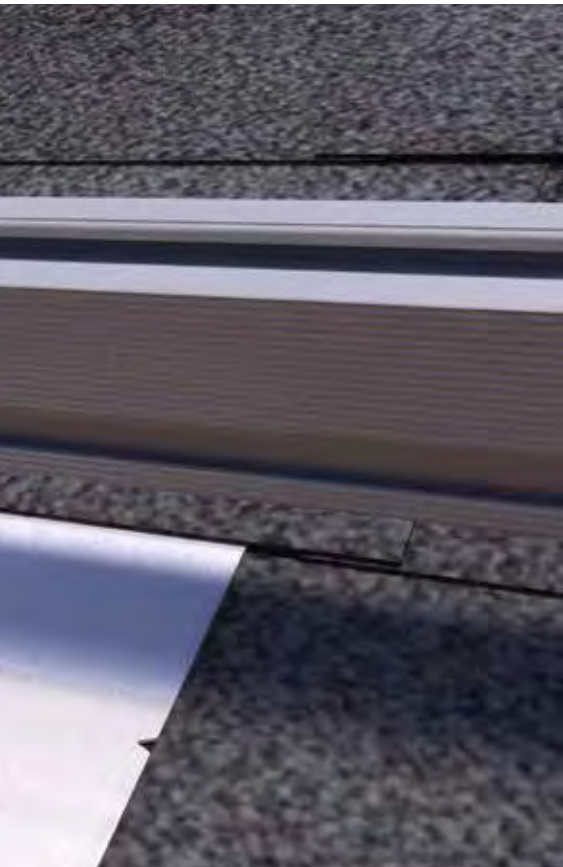
# L-Mount® Series



The L-Mount® Series is designed for cost-effective, one-bolt installation onto existing composition/asphalt shingle roofs. Quick Mount PV engineered its patented Elevated Water Seal Technology® into an integrated L-foot and flashing for super-fast, single-lag bolt installation with unparalleled waterproofing. The L-Mount comes with a lag bolt or structural screw for attachment versatility and works with all leading racks. The L-Mount features a 9" x 12" aluminum flashing with alignment guides and rounded corners to easily slide under shingles and speed installation on the roof.

## FEATURES

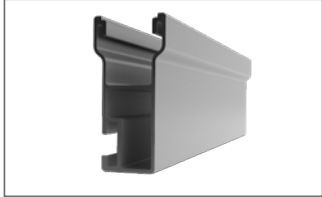
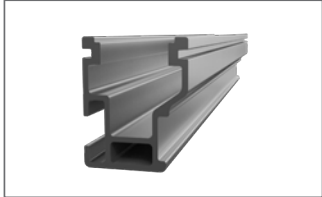
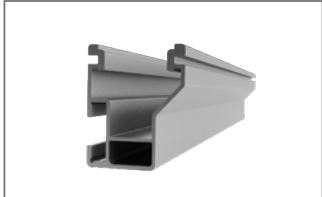
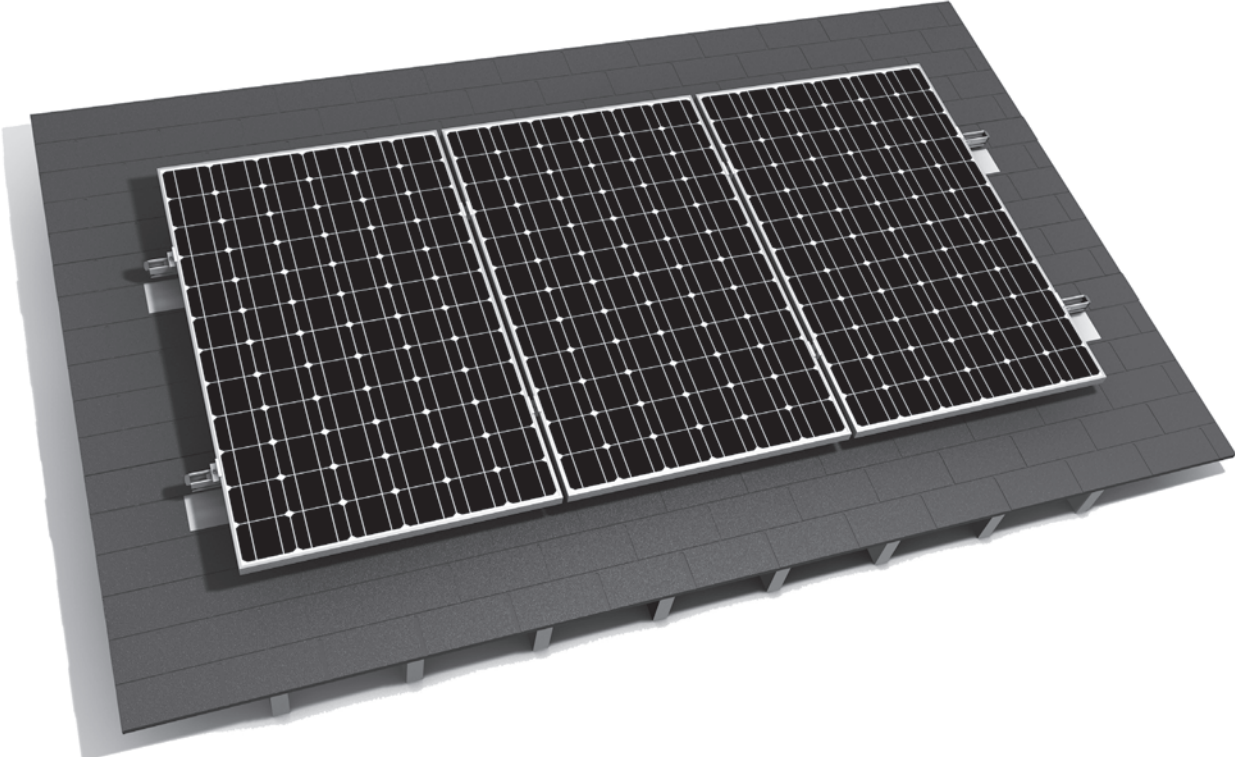
- L-foot can be rotated 360 degree for optimal adjustability
- Works with all leading racks
- Available with lag bolt or structural screw
- QBlock® Elevated Water Seal Technology®
- Single bolt installation, no shingle cutting
- 9" x 12" aluminum flashing
- Meets or exceeds roofing industry best practices; 100% IBC compliant
- 18-8 stainless steel hardware included
- Alignment guides
- 25-year warranty



## SINGLE-SLOT L-MOUNT

Available finishes:  
aluminum mill (A); black (B)

# Mounting systems for solar technology



EVEREST SOLAR SYSTEMS  
**RESIDENTIAL ROOF SOLUTIONS**  
**CROSSRAIL SYSTEM**

Everest Solar Systems, LLC  
3809 Ocean Ranch Blvd., Suite 111  
Oceanside, CA 92056  
Service-Hotline +1.760.301.5300  
info@everest-solarsystems.com  
www.everest-solarsystems.com

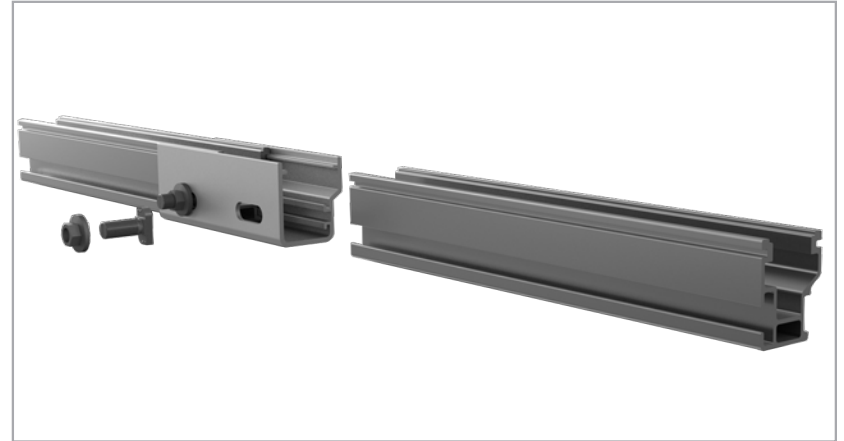
# CROSSRAIL SYSTEM



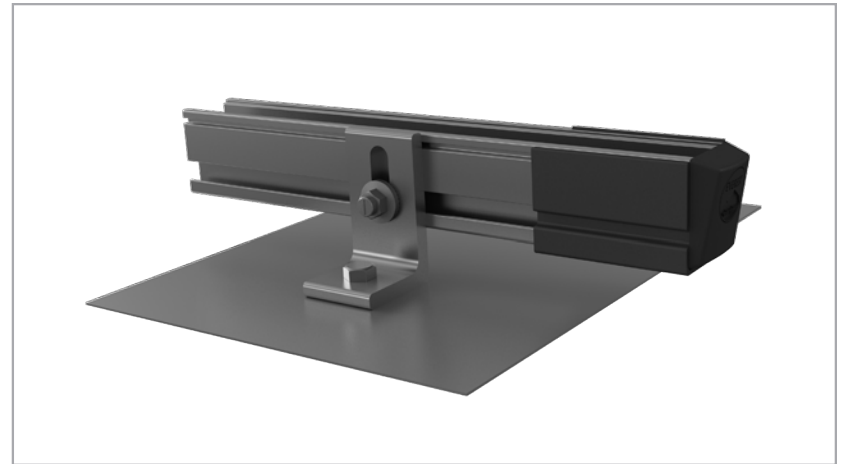
- ▶ High quality, German-engineered system optimized for residential installation
- ▶ MK3 mounting hardware simplifies module installation – fast, easy, and secure
- ▶ Easily integrates with third party roof attachment products
- ▶ L-foot provides adjustability and compatibility with common roof types
- ▶ 100% code-compliant, structural validation for all solar states
- ▶ Three rail sizes available to suit all structural conditions
- ▶ Most components also available in dark
- ▶ Fast installation with minimal component count result in low total installed cost
- ▶ Simple to design using code compliant Everest Online Design Tool
- ▶ Use two innovative components to turn this system into Shared Rail or Tilt Up

## TECHNICAL DATA

Applicable roof types	Composition shingle, tile, flat tile
Flexibility	Modular construction, suitable for any system size, height adjustable
PV modules	For all common module types
Module orientation	Portrait and landscape
Material	High corrosion resistance, stainless steel and high grade aluminum
Roof attachment	Screw connection into rafter
Structural validity	IBC compliant, stamped engineering letters available for all solar states
Warranty	20 years
System components	CrossRail 48-X/48-XL/80, L-Foot, Mid and End Clamp Sets



CrossRail Structural Splice



CrossRail with EverFlash, Rail Sleeve and End Cap



Bonding Mid Clamp | End Clamp | Micro, Optimizer & Accs Mounting Kit