

NEW PHOTOVOLTAIC SYSTEM 11.20 KW DC 7118 U.S. 401 S BUNNLEVEL, NC 28323, USA

GENERAL NOTES

1.1.1 PROJECT NOTES:
 1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
 1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
 1.1.4 ARC FAULT PROTECTION (AFCI) AND PHOTOVOLTAIC RAPID SHUTDOWN SYSTEM (PVRSS) IS INTEGRATED WITH THE POWER OPTIMIZER IN ACCORDANCE WITH NEC 2.10.12 & 690.12 RESPECTIVELY.
 1.1.5 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE INVERTER IN ACCORDANCE WITH NEC 690.41(B)
 1.1.6 ALL PV SYSTEM COMPONENTS: MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4: PV MODULES: UL 1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES); UL 1703 OR UL 1741 ACCESSORY
 1.1.7 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
 1.1.8 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
 1.1.9 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

1.2.1 SCOPE OF WORK:
 1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT
 1.3.1 WORK INCLUDES:
 1.3.2 PV RACKING SYSTEM INSTALLATION - QUICK MOUNT PV
 1.3.3 PV MODULE AND INVERTER INSTALLATION - HANWHA QCELL Q.PEAK DUO BLK ML-G10+400W / SOLAREDDGE SE10000H-US / SOLAREDDGE POWER OPTIMIZER P401
 1.3.4 PV EQUIPMENT ROOF MOUNT
 1.3.5 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX
 1.3.6 PV LOAD CENTERS (IF INCLUDED)
 1.3.7 PV METERING/MONITORING (IF INCLUDED)
 1.3.8 PV DISCONNECTS
 1.3.9 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
 1.3.10 PV FINAL COMMISSIONING
 1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
 1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

PROJECT INFORMATION

OWNER
 NAME: ALFREDO SERRANO RAMIREZ
 PHONE: (919) 817-1862

CONTRACTOR INFORMATION:
 CONTRACTOR NAME: PALMETTO
 CONTRACTOR ADDRESS: 1505 KING ST,
 CHARLESTON, SC 29405
 CONTRACTOR PHONE: (855) 339-1831

SCOPE OF WORK:
 SYSTEM SIZE : STC : 28 X 400W= 11.20 KW DC
 PTC : 28 X 376.55W = 10.54 KW DC
 AC SIZE: 10 KW AC
 (28) HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400W
 (1) SOLAREDDGE SE10000H-US
 (28) SOLAREDDGE POWER OPTIMIZER P401

ATTACHMENT TYPE: ROOF MOUNT
 MSP UPGRADE: NO

AUTHORITIES HAVING JURISDICTION:
 BUILDING : HARNETT COUNTY
 ZONING : HARNETT COUNTY
 UTILITY : DUKE ENERGY (PROGRESS ENERGY CAROLINAS INC)

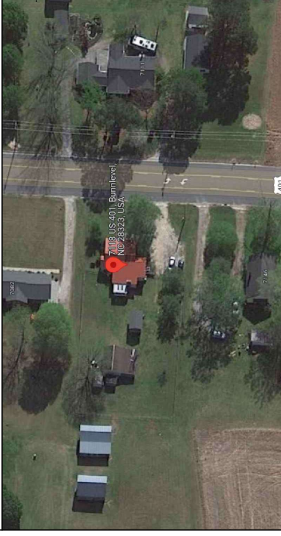
DESIGN SPECIFICATION:
 OCCUPANCY : R3/SINGLE FAMILY RESIDENTIAL
 CONSTRUCTION TYPE / FIRE RATING : 5-B
 GROUND SNOW LOAD (STATE) : 10 PSF
 WIND EXPOSURE : C
 WIND SPEED (STATE) : 120 MPH

APPLICABLE CODES & STANDARDS
 ELECTRICAL : NEC 2017
 FIRE CODE : 2018 NC FIRE PREVENTION CODE
 OTHER : 2018 NORTH CAROLINA STATE BUILDING CODE

VICINITY MAP



SATELLITE VIEW



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COVER PAGE	

DRAWN DATE	10/18/2022
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REVIEWED BY	-

SHEET NUMBER	T-001
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REVISIONS	DESCRIPTION	DATE

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 NOTES

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STRUCTURAL ONLY



2.6.1 DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:
 2.6.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
 2.6.3 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
 2.6.4 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).
 2.6.5 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.
 2.6.6 OPTIMIZER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).
 2.6.7 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

2.7.1 INTERCONNECTION NOTES:
 2.7.2 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)]
 2.7.3 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(B)(2)(3)(b)].
 2.7.4 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)].
 2.7.5 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).
 2.7.6 FEEDER TAP INTERCONNECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1)
 2.7.7 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)]

2.4.1 WIRING & CONDUIT NOTES:
 2.4.2 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
 2.4.3 CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
 2.4.4 VOLTAGE DROP LIMITED TO 3.0%.
 2.4.5 DC WIRING LIMITED TO INVERTER FOOTPRINT. OPTIMIZER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS
 2.4.6 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].

2.5.1 GROUNDING NOTES:
 2.5.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
 2.5.3 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122
 2.5.4 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).
 2.5.5 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45 AND INVERTER MANUFACTURERS INSTRUCTIONS.
 2.5.6 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 MANUFACTURER INSTALLATION REQUIREMENTS.
 2.5.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
 2.5.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]
 2.5.9 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.
 2.5.10 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

2.1.1 SITE NOTES:
 2.1.2 A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
 2.1.3 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITHOUT STORAGE BATTERIES.
 2.1.4 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
 2.1.5 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26.
 2.1.6 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.
2.2.1 EQUIPMENT LOCATIONS:
 2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
 2.2.3 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).
 2.2.4 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
 2.2.5 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.
 2.2.7 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.
2.3.1 STRUCTURAL NOTES:

2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.
 2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
 2.3.4 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
 2.3.5 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.

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 SITE PLAN

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 A-101

LEGEND

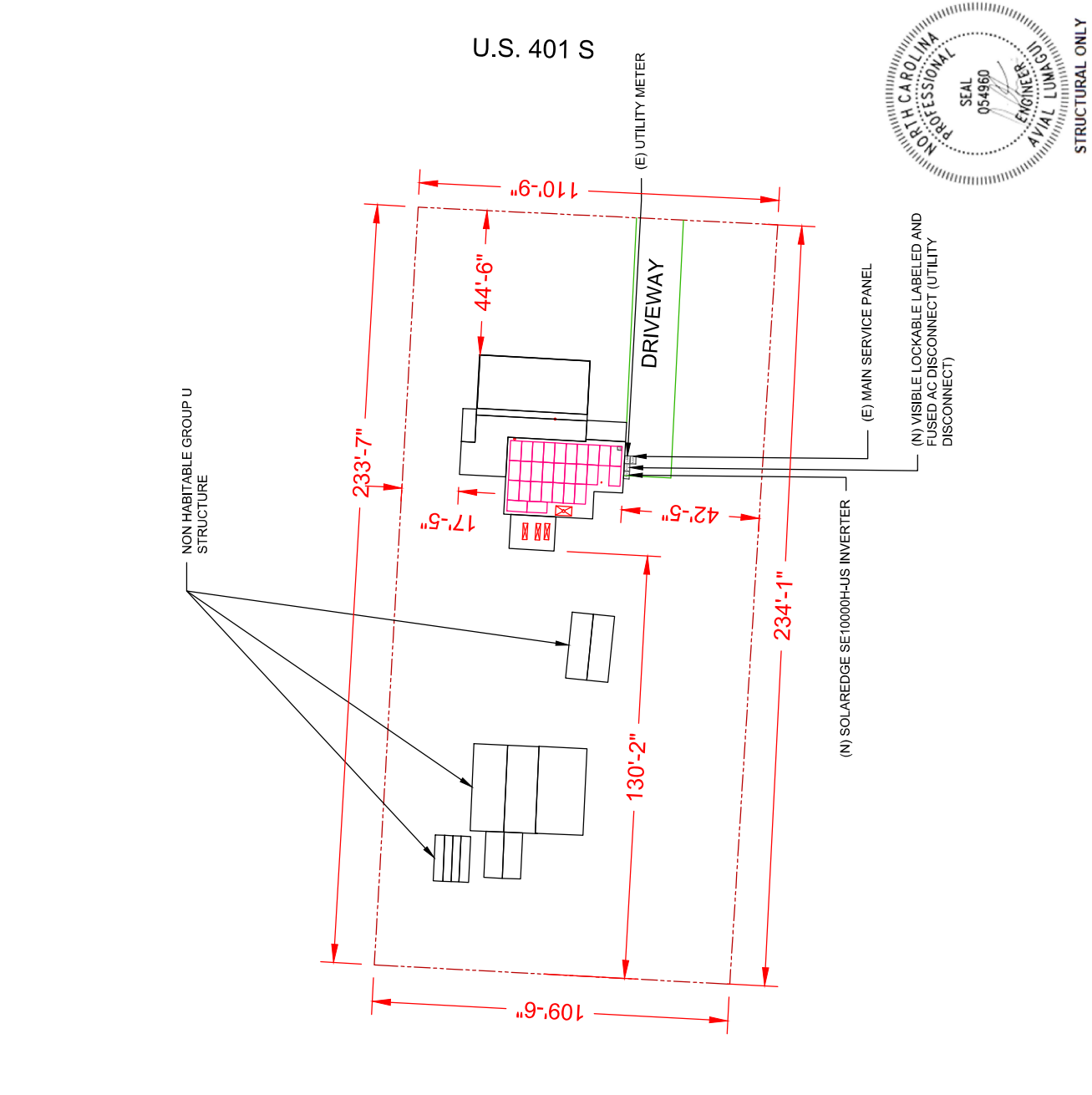
- FIRE SETBACK
- PROPERTY LINE
- FENCE
- JUNCTION BOX
- SKYLIGHT (ROOF OBSTRUCTION)
- CHIMNEY (ROOF OBSTRUCTION)
- VENT, ATTIC FAN (ROOF OBSTRUCTION)

1	MODULE	HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400W
2	INVERTER	SOLAREEDGE SE10000H-US
3	OPTIMIZER	SOLAREEDGE POWER OPTIMIZER P401
4	MOUNTS	S-51 PROTEA BRACKET
5	RAIL	IRON RIDGE XR-10-168M, XR10 RAIL

ARRAY AREA & ROOF AREA CALC'S

ROOF #	#OF MODULES	ARRAY AREA (SQ.FT)	ROOF AREA COVERED (SQ.FT)	BY	ARRAY (%)
#1	28	591.64	798.12		74.129

1 | **SITE PLAN**
 SCALE: 1/32" = 1'-0"



STRUCTURAL ONLY

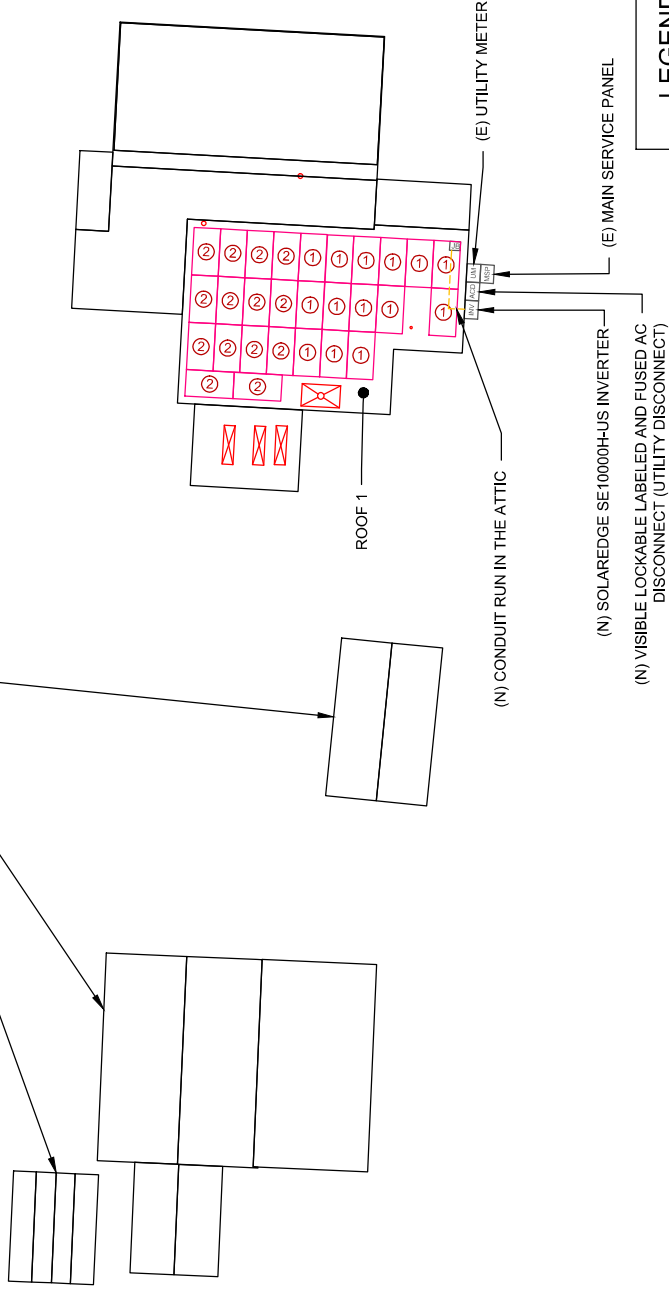
ROOF SECTION(S)

ROOF 1	TILT - 8° AZIMUTH - 273° MODULE - 28
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- ① - MODULE STRING
- ② - MODULE STRING

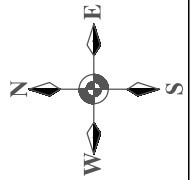
1	MODULE	HANWHA QCELL Q PEAK DUO BLK ML-G10+ 400W
2	INVERTER	SOLAREDDGE SE10000H-US
3	OPTIMIZER	SOLAREDDGE POWER OPTIMIZER P401
4	MOUNTS	S-5i PROTEA BRACKET
5	RAIL	IRON RIDGE XR-10-168M, XR10 RAIL

NON HABITABLE GROUP U
STRUCTURE



LEGEND

- FIRE SETBACK
- PROPERTY LINE
- FENCE
- JUNCTION BOX
- SKYLIGHT (ROOF OBSTRUCTION)
- CHIMNEY (ROOF OBSTRUCTION)
- VENT, ATTIC FAN (ROOF OBSTRUCTION)



1 | **ELECTRICAL PLAN**
SCALE: 1/16" = 1'-0"

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ELECTRICAL PLAN

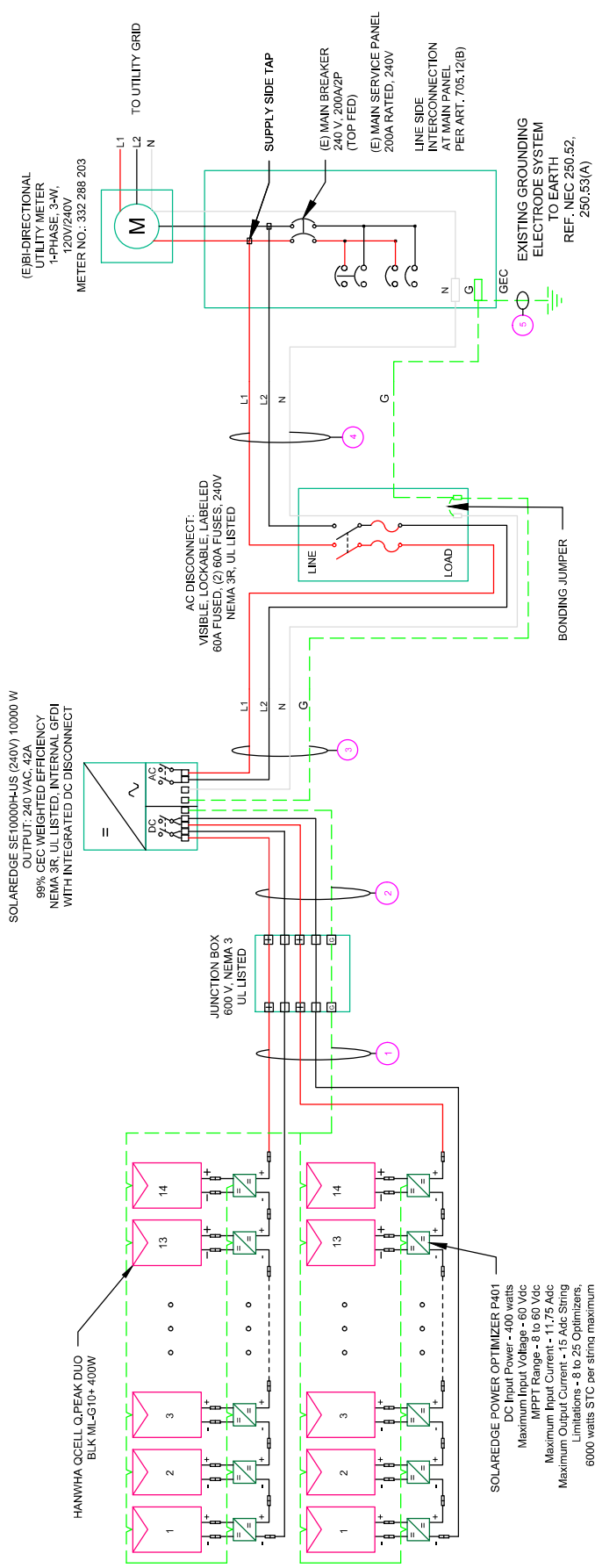
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A-102

DC SYSTEM SIZE: 11.20 kW DC
AC SYSTEM SIZE: 10 kW AC

(28) HANWHA QCELL Q-PEAK DUO BLK ML-G10+ 400W MODULES
(2) STRINGS OF 14 MODULES CONNECTED IN SERIES

PHASE CONDUCTOR QTY. SIZE AND TYPE PER CONDUIT		NEUTRAL		GROUND CONDUCTOR QTY. SIZE AND TYPE PER CONDUIT		CONDUIT SIZE		CONDUIT TYPE	
1	4 AWG #10	PV-WIRE/USE-2, COPPER	N/A	1	AWG #6	BARE COPPER EGC	N/A	FREE AIR	FREE AIR
2	4 AWG #10	THWN-2, COPPER	N/A	1	AWG #10	THWN-2, COPPER EGC	3/4"	EMT	EMT
3	2 AWG #6	THWN-2, COPPER	1 AWG #6	1	AWG #10	THWN-2, COPPER EGC	3/4"	EMT	EMT
4	2 AWG #6	THWN-2, COPPER	1 AWG #6	1	N/A	N/A	N/A	EMT	EMT
5				1	AWG #6	BARE COPPER	N/A	FREE AIR	FREE AIR



MODULE	DESCRIPTION
1	HANWHA QCELL Q-PEAK DUO BLK ML-G10+ 400W
2	SOLAREDGE SE10000H-US
3	SOLAREDGE POWER OPTIMIZER P401
4	S-6I PROTEA BRACKET
5	IRON RIDGE XR-10-168M, XR10 RAIL

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WARNING:
PHOTOVOLTAIC
POWER SOURCE

LABEL 1
ON ALL CONDUITS SPACED AT MAX 10FT

**PHOTOVOLTAIC
AC DISCONNECT**

LABEL 6
AT EACH AC DISCONNECT

! CAUTION !
SOLAR ELECTRIC
SYSTEM CONNECTED
AND ENERGIZED

LABEL 2
AT INVERTER

! WARNING !
DUAL POWER SOURCES
SECOND SOURCE IS PV SYSTEM

LABEL 7
AT MEP

**SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN**

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

LABEL 3
AT INVERTER

! WARNING !
SOLAR SYSTEM CONNECTED
AND ENERGIZED

LABEL 8
AT MEP

**PHOTOVOLTAIC
DC DISCONNECT**

LABEL 4
AT DC DISCONNECT

! CAUTION !
SOLAR POINT OF
INTERCONNECTION

LABEL 9
AT UTILITY METER

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

LABEL 5
AT EACH AC DISCONNECT

! WARNING !
THE SERVICE METER IS ALSO SERVED
BY A PHOTOVOLTAIC SYSTEM

LABEL 10
AT UTILITY METER

PHOTOVOLTAIC AC DISCONNECT SWITCH

- RATED OUTPUT CURRENT: 42 AMPS
- NOMINAL OPERATING VOLTAGE: 240 VOLTS

LABEL 11
AT AC DISCONNECT

MAXIMUM VOLTAGE	480 V
MAXIMUM CIRCUIT CURRENT	30 A
MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)	15 A

LABEL 12
AT INVERTER

**EMERGENCY CONTACT
INFORMATION**

CONTRACTOR: PALMETTO
PHONE: (855) 339-1831

CAUTION

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

PALMETTO INSTALLATION HOTLINE
CALL OR TEXT: 1-843-258-5389
INSTALLHOTLINE@PALMETTO.COM

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PLACARDS

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Q.PEAK DUO BLK ML-G10+

385-405

ENDURING HIGH PERFORMANCE

- WARRANTY**
25 YEARS PRODUCT WARRANTY
- TOP BRAND PV MODULES**
EUPD RESEARCH 2021
- Yield Security**
Q CELLS
- BREAKING THE 20% EFFICIENCY BARRIER**
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.
- THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY**
Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry. The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.
- INNOVATIVE ALL-WEATHER TECHNOLOGY**
Optimal yields, whatever the weather with excellent low-light and temperature behavior.
- ENDURING HIGH PERFORMANCE**
Long-term yield security with Anti-LUD Technology, Anti-PID Technology, Hot-Spot Protect and Traceable Quality Tra.QM.
- EXTREME WEATHER RATING**
High-tech aluminum alloy frame, certified for high snow (5400Pa) and wind loads (400CPa).
- A RELIABLE INVESTMENT**
Inclusive 25-year product warranty and 25-year linear performance warranty.*

* APT test conditions according to IEC/TS 62804-4:2015, method A (L-150D, V, 96h)
* See data sheet on rear for further information.



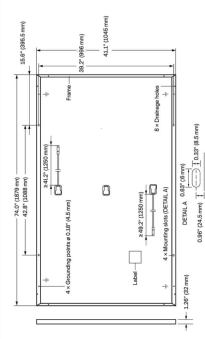
THE IDEAL SOLUTION FOR:
Rooftop arrays on residential buildings

Engineered in Germany



MECHANICAL SPECIFICATION

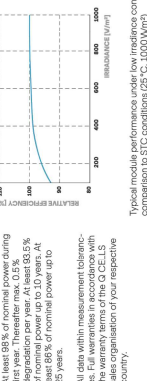
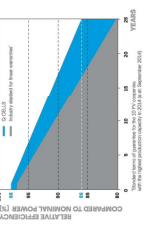
Format	710mm x 411mm x 1.26in (including frame)
Weight	48.5kg (107.0lb) (max. 52mm)
Front Cover	0.39in (3.2mm) (temperally pre-stressed glass with anti-reflection technology)
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 x 22 mono-crystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98in x 1.26-2.36in x 0.99-0.71in (53-10.0mm x 32-60mm x 15-18mm), IP67, with bypass diodes
Cable	4mm ² Solar cable; (+) ≥ 49.2in (L250mm), (-) ≥ 49.2in (L250mm)
Connector	ShubiniMC4; IP68



ELECTRICAL CHARACTERISTICS

POWER CLASS	385	390	395	400	405
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE ±5W/-0W)					
Power at MPP ²	385	390	395	400	405
Open Circuit Voltage ³	45.19	45.23	45.27	45.30	45.34
Current at MPP	10.59	10.65	10.71	10.77	10.83
Efficiency ⁴	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ⁵					
Power at MPP	288.8	292.6	296.3	300.1	303.8
Open Circuit Voltage	42.62	42.65	42.69	42.72	42.76
Current at MPP	8.35	8.41	8.46	8.51	8.57
Efficiency ⁴	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MINIMUM PERFORMANCE AT LOW IRRADIANCE					
Power at MPP	292.6	296.3	300.1	303.8	307.5
Open Circuit Voltage	42.62	42.65	42.69	42.72	42.76
Current at MPP	8.35	8.41	8.46	8.51	8.57
Efficiency ⁴	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6

Q CELLS PERFORMANCE WARRANTY
Measurement tolerance: P_{max} ±1%, I_{sc} ±0.5%, V_{oc} ±5% at STC, 1000W/m², 25±2°C, AM 1.5 according to IEC 60904-3, 1000W/m², NMOT: see table AM 1.5



TEMPERATURE COEFFICIENTS
Temperature Coefficient of P_{max}: -0.40 %/K
Temperature Coefficient of V_{oc}: -0.34 %/K
Nominal Module Operating Temperature (NMOT): 103±5.4 (63±3 °C)

PROPERTIES FOR SYSTEM DESIGN
Maximum System Voltage^{max} [V]: 1000 (IEC/1000 (UL) - PV module classification)
Maximum Series Fuse Rating [A DC]: 20
Max. Design Load, Push/Pull [lb/ft²]: 75 (6800 Pa) / 55 (2960 Pa)
Max. Test Load, Push/Pull [lb/ft²]: 113 (6400 Pa) / 84 (4000 Pa)

QUALIFICATIONS AND CERTIFICATES
UL 6170, CE, TÜV Rheinland, IEC 61215-2:2016, IEC 61730-2:2016, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, GCRP (Greenhouse Gases)

PACKAGING INFORMATION
Horizontal Packaging: 1940mm x 1100mm x 1220mm (75kg) pallets, modules
Vertical Packaging: 1940mm x 1100mm x 1220mm (75kg) pallets, modules

NOTES: Installation instructions must be followed. See the installation and operating manual for further information on approved installation and use of the product.

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SHEET TITLE	RESOURCE DOCUMENT
DRAWN DATE	10/18/2022
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REVIEWED BY	-
SHEET NUMBER	R-001

Specifications subject to technical changes © Q CELLS Q.PEAK DUO BLK ML-G10+ -385-405-2021-05-18q402, JVA

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
- ✓ 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)

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INVERTERS

Single Phase Inverter with HD-Wave Technology for North America

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

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US
OUTPUT							
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V
AC Output Voltage (Min-Nom-Max) UL1741-240V-208V	✓	✓	✓	✓	✓	✓	✓
AC Output Voltage (Min-Nom-Max) IEC 60364-230V-230V-400V	-	✓	✓	✓	✓	✓	✓
AC Frequency (Nominal)			59.3 - 60 - 60.5 ³⁾				
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5
Grid Threshold			1				
Utility Monitoring, Islanding Protection, Country Configurable Thresholds			Yes				
INPUT							
Maximum DC Power @240V	4630	5900	7750	9100	11800	15300	17650
Maximum DC Power @208V	-	5100	-	7750	-	-	15500
Transformer-less, Ungrounded			Yes				
Maximum Input Voltage		380		480			
Normal DC Input Voltage		380		480			
Maximum Input Current @240V ²⁾	8.5	10.5	13.5	16.5	20	27	30.5
Maximum Input Current @208V ²⁾	-	9	-	13.5	-	-	27
Max. Input Short-Circuit Current				45			
Reverse-Polarity Protection			Yes				
Ground-Fault Isolation Detection			600k Ω Sensitivity				
Maximum Inverter Efficiency	99	99	99.2				
CCC Weighted Efficiency			< 2.5				
Nighttime Power Consumption							
ADDITIONAL FEATURES							
Supported Communication Interfaces			RS485, Ethernet, ZigBee (optional), Cellular (optional)				
Revenue Grade Data, ANSI C12.20			Optional ¹⁾				
Rapid Shutdown - NEC 2014 and 2017 690.12			Automatic Rapid Shutdown upon AC Grid Disconnect				
STANDARD COMPLIANCE							
Safety			UL1741, UL1741 SA, UL10998, CSA C22.2, Canadian AFCI according to ILL 14-07				
Grid Connection Standards			IEEE1547, Rule 21, Rule 14 (A4)				
Emissions			FCC Part 15 Class B				
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range			3/4" minimum / 14-6 AWG			3/4" minimum / 14-4 AWG	
DC Input Conduit Size / # of Strings / AWG Range			3/4" minimum / 1-2 strings / 14-6 AWG			3/4" minimum / 1-3 strings / 14-6 AWG	
Dimensions with Safety Switch (HxWxD)			11.7 x 14.6 x 6.8 / 450 x 370 x 174			21.3 x 14.6 x 7.3 / 540 x 370 x 185	
Weight with Safety Switch			22 / 10			36.2 / 11.9	
Noise			< 25			38.8 / 17.6	
Cooling			Natural Convection			< 50	
Operating Temperature Range			-40 to +140 / -25 to +68 ¹⁾ (-40 ¹⁾ / 7 ¹⁾ °C				
Protection Rating			NEMA-4X (Inverter with Safety Switch)				

RoHS

¹⁾ For other regional settings please contact SolarEdge support.
²⁾ A higher current source may be used; the inverter will limit its input current to the value stated.
³⁾ For power distribution information refer to: <https://www.solaredge.com/sites/default/files/temperature-rating-note-na.pdf>
 P-40 version P/N: 16500H-US000N004
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REVISIONS	DATE	DESCRIPTION

SHEET TITLE RESOURCE DOCUMENT	
DRAWN DATE	10/18/2022
DRAWN BY	VR
REVIEWED BY	-
SHEET NUMBER R-002	

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / 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 (PVRS)
- Module-level voltage shutdown for installer and firefighter safety

solaredge.com



Power Optimizer For North America

P320 / P340 / P370 / P400 / **P401** / P405 / P485 / 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)	P401 (for high power 60 and 72 cell modules)	P405 (for high-voltage modules)	P485 (for high-voltage modules)	P505 (for higher current modules)
Rated Input DC Power ¹⁾	320	340	370	400	400	405	485	505
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	48	60	80	60	125 ²⁾	125 ²⁾	83 ³⁾
Input Operating Range	8 - 48	8 - 48	8 - 60	8 - 80	8 - 60	12.5 - 105	12.5 - 105	12.5 - 83
Maximum Short Circuit Current (Isc)	11	11	10.1	10.1	11.75	11	14	14
Maximum DC Input Current	13.75	13.75	12.5	12.5	14.65	12.5	17.5	17.5
Maximum Efficiency	99.5							
Weighted Efficiency	98.8							
Overvoltage Category	II							

INPUT	
Rated Input DC Power ¹⁾	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	Vdc
Input Operating Range	Vdc
Maximum Short Circuit Current (Isc)	Adc
Maximum DC Input Current	Adc
Maximum Efficiency	%
Weighted Efficiency	%

OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDEGE INVERTER)	
Maximum Output Current	Adc
Maximum Output Voltage	Vdc

OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDEGE INVERTER OR SOLAREDEGE INVERTER OFF)

Safety Output Voltage per Power Optimizer	Vdc
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STANDARD COMPLIANCE

EMC	RCC Part15 Class B, IEC61000-6-2, IEC61000-6-3
Safety	IEC60950-1 (Class II safety), UL1741
Materials	UL94 V-0, UV Resistant
RoHS	Yes

INSTALLATION SPECIFICATIONS

Maximum Allowed System Voltage	Vdc
Compatible Inverters	All SolarEdge Single Phase and Three Phase Inverters
Dimensions (W x L x H)	129 x 153 x 33.5 / 129 x 153 x 29.5 / 129 x 153 x 49.5 / 51 x 6 x 1.1 / 51 x 6 x 1.6 / 51 x 6 x 1.6
Weight (including cables)	680 / 1.4 / 750 / 1.7 / 855 / 1.5 / 945 / 1.9 / 1047 / 2.3 / 97 / lb
Input Connector	MC4 ⁴⁾ / Single or dual MC4 ⁴⁾
Input Wire Length	0.167 / 0.32
Output Wire Type / Connector	Double insulated / MC4
Output Wire Length	0.97 / 2.95
Operating Temperature Range ⁵⁾	-40 ~ +85 / -40 ~ +85
Protection Rating	IP68 / NEMA4P
Relative Humidity	0 ~ 100

¹⁾ Rated power of the module at 25°C will not exceed the optimizer "rated input DC Power". Modules with up to +5% power tolerance are allowed.
²⁾ For dual-wire systems, the maximum input voltage is 125VDC.
³⁾ For other connector types please contact SolarEdge.
⁴⁾ For dual-wire systems, the maximum input voltage is 125VDC. In the case of an odd number of PV modules in one string, installing one P485 dual-wire power optimizer connected to the string will allow for a maximum of 125VDC.
⁵⁾ For ambient temperature above +85°C / +185°F, power derating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter ⁶⁾	Single Phase HD-Wave		Single phase		Three Phase for 208V grid		Three Phase for 277/480V grid	
	P320, P340, P370, P400, P401	P405, P485, P505	8	10	10	18	18	18
Minimum String Length (Power Optimizers)	25	25	25	25	25	50 ⁷⁾	50 ⁷⁾	50 ⁷⁾
Maximum Power per String	5700 6000 with SE7600-US - SE11400-US	5250	6000 ⁸⁾	12750 ⁹⁾	W			

Parallel Strings of Different Lengths or Orientations: Yes
⁶⁾ For dual-wire systems, the maximum input voltage is 125VDC. In the case of an odd number of PV modules in one string, installing one P485 dual-wire power optimizer connected to the string will allow for a maximum of 125VDC.
⁷⁾ It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string.
⁸⁾ A string with more than 30 optimizers does not meet NEC rapid shutdown requirements, safety voltage will be above the 30V requirement.
⁹⁾ For 277/480V grid, it is advised to install 10 to 15, 5000VA per string when the maximum power difference between each string is 200W.

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REV	DESCRIPTION	DATE

SHEET TITLE
RESOURCE DOCUMENT

DRAWN DATE: 10/18/2022
 DRAWN BY: VR
 REVIEWED BY: -
 SHEET NUMBER: R-003

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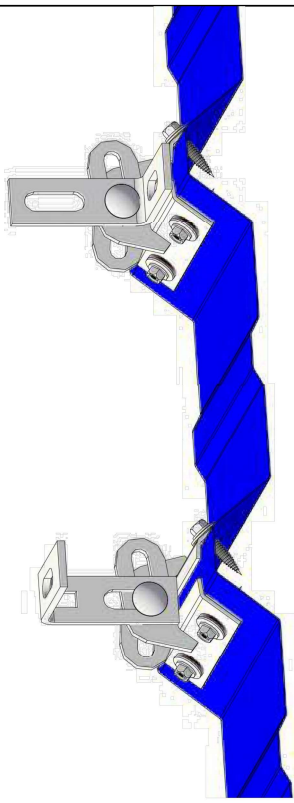
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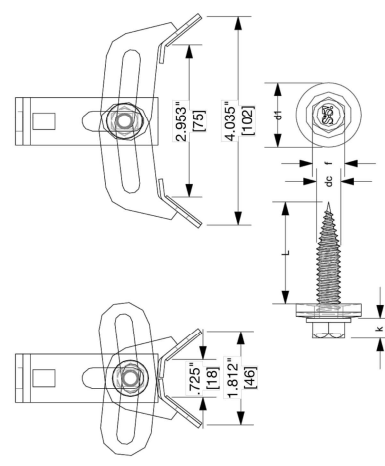
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ProteaBracket



MM	INCH	k	L	dc	di	f
3.9	.15	6.10425	25.4	14.7	7.6	7.6
24.246	.95	24.246	1	.58	.31	.31

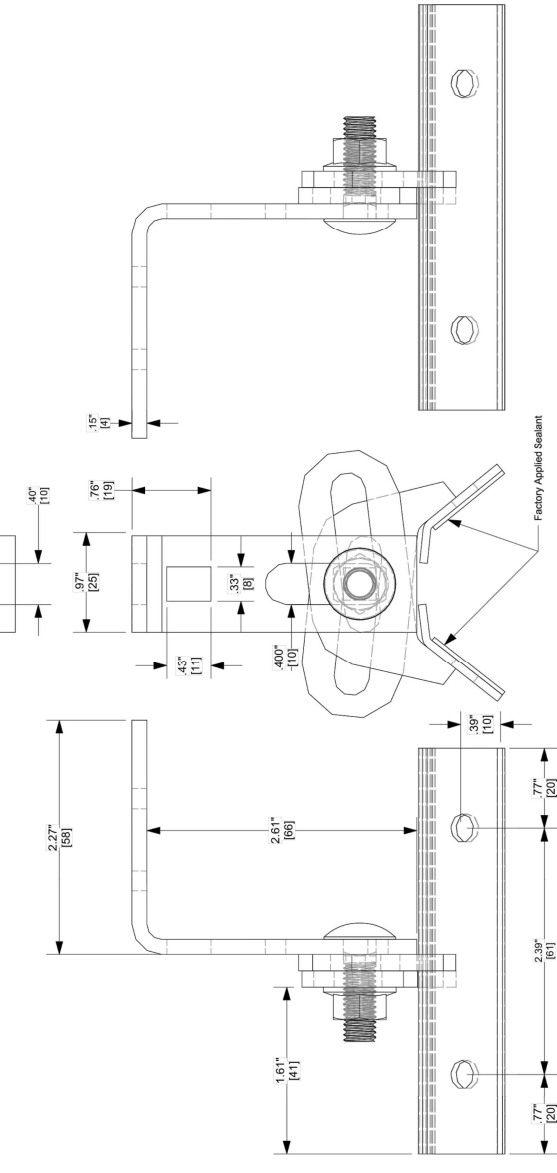
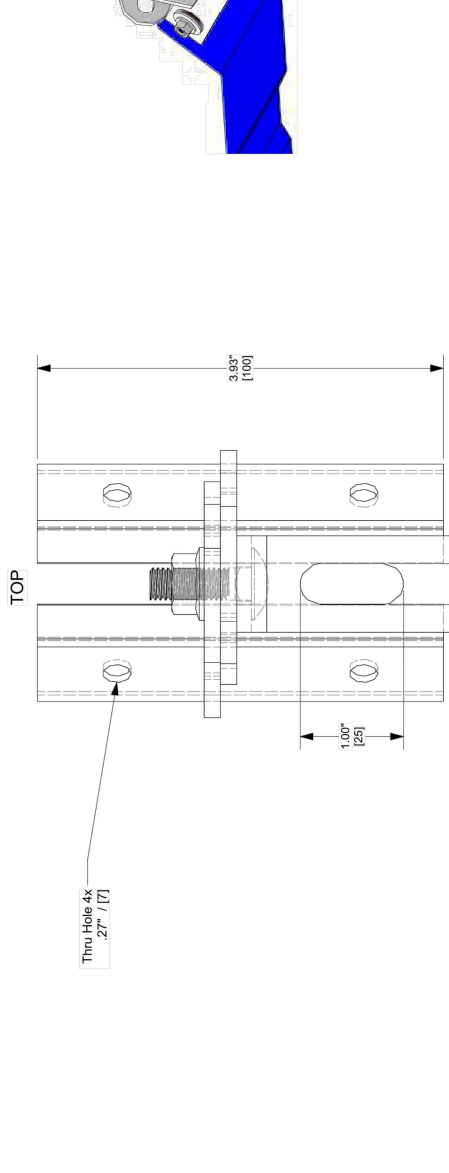
6mm X 25mm (6mm Hex W/16mm Washer)

FOR STANDING SEAM SPECIFIC MECHANICAL LOAD TEST INFORMATION AND CLAMP INSTALLATION INFORMATION PLEASE VISIT: WWW.S-5.COM

MATERIAL:
A2 Stainless
 EST ASSEMBLY WEIGHT :
.526 lbs
 SUPPLIED HARDWARE:
 1/4" Hex X 25mm (1.0" Hex Washer)
 16mm Hex Washer

TITLE: S-51 ProteaBracket
 DRAWING NO: ProteaBracket_CCD_2015
 DRAWN BY: DMH
 DATE: 10/5/2015

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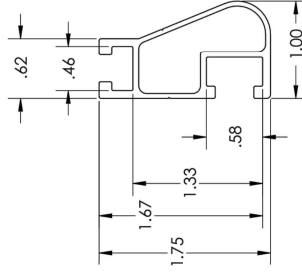
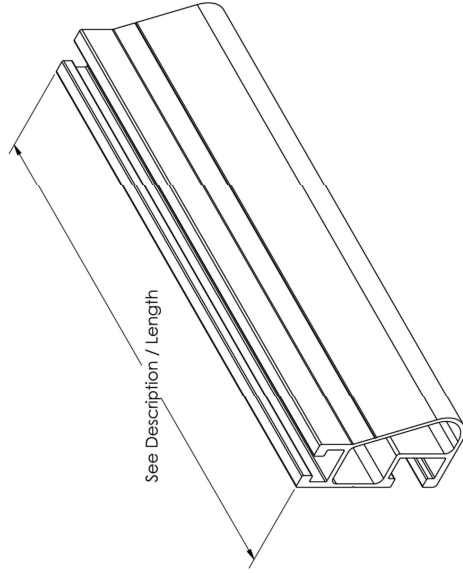


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 8655 TABLE BUTTE RD
 COLORADO SPRINGS, CO 80908
 719-495-0518
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Cut Sheet



XR10 Rail



Rail Section Properties	
Property	V value
Total Cross-Sectional Area	0.363 in ²
Section Modulus (X-axis)	0.136 in ³
Moment of Inertia (X-axis)	0.124 in ⁴
Moment of Inertia (Y-axis)	0.032 in ⁴
Torsional Constant	0.076 in ³
Polar Moment of Inertia	0.033 in ⁴

Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-10-132A	XR-10-132B	XR10, Rail 132" (11 Feet)	6000-Series	4.67 lbs.
XR-10-168A	XR-10-168B	XR10, Rail 168" (14 Feet)	Aluminum	5.95 lbs.
XR-10-204A	XR-10-204B	XR10, Rail 204" (17 Feet)		7.22 lbs.

v1.0

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